Cumberland Island National Seashore
Georgia

National Park Service
U.S. Department of the Interior

Visitor Use Management Plan and Environmental Assessment

NOVEMBER 2022

CUMBERLAND ISLAND NATIONAL SEASHORE

VISITOR USE MANAGEMENT PLAN
AND
ENVIRONMENTAL ASSESSMENT

GEORGIA

NOVEMBER 30, 2022

NOTE TO REVIEWERS AND RESPONDENTS

Respondents are encouraged to submit their comments on this environmental assessment electronically at the NPS Planning, Environment and Public Comment (PEPC) website (http://parkplanning.nps.gov/CUIS). If that is not an option, written comments may be mailed to the address listed below. All comments must be received by November 30, 2022.

Before including personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Attn: Superintendent
Cumberland Island National Seashore
101 Wheeler Street
St. Marys, GA 31558

CONTENTS

FIGURES

TABLES

CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

Cumberland Island is approximately 7.0 nautical miles by boat from St. Marys, Georgia, and can only be reached by water transportation. Island visitation is serviced by a ferry that runs from the St. Marys mainland visitor center to docks on the island at Dungeness and Sea Camp. The Cumberland Island National Seashore (the park) general management plan (GMP) directs the park staff to manage visitation for approximately 300 people a day. Recreational opportunities at Cumberland Island include walking and hiking, camping, beachcombing, swimming, wildlife viewing, seeking solitude, and visiting the park's historic sites. This plan is comprehensive and includes visitor use management (VUM) direction for the whole park, and would amend certain portions of the park's general management plan.

The VUM Plan / Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, and implementing regulations, the Update to Regulations Implementing the Procedural Provisions of the National Environmental Policy Act (2022), 40 *Code of Federal Regulations* (CFR) Parts 1500–1508, Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011), and its accompanying handbook (NPS 2015).

PURPOSE OF THE PLAN

The park is developing a visitor use management plan (the plan) to determine appropriate opportunities for visitors to use, experience, and enjoy Cumberland Island National Seashore and to develop strategies to concurrently protect resources. This plan examines management options to enhance the protection of natural, cultural, and scenic resources and values, while providing visitors improved accessibility to a variety of with opportunities to be inspired through personal connections with those resources.

NEED FOR ACTION

The park's 1984 general management plan states that "visitation to the island is to remain at approximately 300 people a day." Daily visitation levels are a recurring source of debate with stakeholders. This plan is needed to identify visitor capacity for the island, which would reduce barriers for new and diverse groups visiting the island, while protecting resources and providing high-quality visitor experiences.

Changes in visitation, if not addressed through management and planning, could adversely impact natural resources, visitor experience, and wilderness character. The plan is needed to reduce visitor impacts on sensitive natural resources such as nesting shorebirds.

The plan is also needed to identify effective strategies for managing visitor use. There are unrealized opportunities to enhance visitor experience in the park through evaluation of appropriate activities, facilities, and services, including appropriate commercial services, special uses, and bicycle use. As most visitors arrive by ferry, changes to visitor capacity also require guidance for ferry transportation to and from the island.

Additionally, the plan is needed to consider visitation changes in relationship to wilderness mandates. The plan's actions should enhance visitor access to the wilderness area, while preserving

wilderness character. Wilderness character at the park includes opportunities for solitude and natural, untrammeled, and undeveloped qualities.

The park offers opportunities for high-quality resources and experiences, however, changes in visitation require thoughtful decision making to ensure the desired resource conditions and visitor experiences are being achieved and maintained, consistent with the purposes for which the area was established.

BACKGROUND

In 2014, Cumberland Island National Seashore completed a foundation document that listed a visitor use management plan as a high-priority planning need to address visitor use patterns, access to, and arrival on the island; incorporate visitor (carrying) capacity data; and address the management of daily visitation levels. As noted in the foundation document, the visitor use management plan would address visitor use for the entire park and address a variety of visitor experience needs and resource issues (as noted above in the "Need for Action" description). The foundation document also noted that the 1984 general management plan states that "visitation to the island is to remain at approximately 300 people a day." According to the foundation document, the daily visitation levels are a recurring source of debate with stakeholders, and the park identified the need to revisit the most effective management of use levels through a visitor use management plan.

This document is part of Cumberland Island National Seashore's planning portfolio. Together, all of the documents in a park's planning portfolio comprise park management philosophy and create a logical, trackable guide for future park management actions.

The National Parks and Recreation Act of 1978 (54 *United States Code* [USC] 100502) requires the preparation and timely revision of general management plans for each unit of the national park system. At a minimum, each park must have a plan or series of plans that address the four statutory requirements identified in 54 USC 100502:

1. Measures for the preservation of area resources.
2. Indications of types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs.
3. Identification of an implementation commitment for visitor carrying capacities for all areas of the unit.
4. Indications of potential modifications to the external boundaries of the unit, and the reasons, therefore.

This visitor use management plan addresses each of the above statutory requirements. As such, this plan serves as an amendment to the 1984 General Management Plan.

The VUM Plan / Environmental Assessment was developed by an interdisciplinary planning team led by the National Park Service (NPS). Opportunities for public input were provided during the development of the plan.

PROJECT AREA

Cumberland Island is the largest and southernmost of Georgia's barrier islands, located 1.0 to 3.0 miles off the mainland. The island is 17.5 miles long, ranging from approximately 0.5 mile to 3.0 miles wide, and totals 36,415 acres of which 16,850 are marsh, mud flats, and tidal creeks. The northern

portion of the island includes 9,907 acres of designated wilderness and an additional 10,710 acres are classified as potential wilderness[1] (Public Law [PL] 97-250). Most of the island's uplands are federally owned and managed by the National Park Service. The remaining portions of the island are state owned, privately owned, or owned by other federal entities, including the Department of Defense (DOD). Cumberland Island National Seashore includes the island and a small parcel on the mainland in St. Marys, Georgia (figure 1).

The national seashore has the greatest diversity of habitats and biotic communities of any of Georgia's coastal islands. Extensive Spartina marshes and tidal creeks cover the western shoreline, providing highly productive estuarine nursery and feeding grounds for juvenile fish, shrimp, crabs, and other invertebrates. Upland forest communities comprise a large portion of the island. Oak and pine dominate most mature forests and saw palmetto is a common understory plant. Additionally, the island has a sizeable acreage of scrub/shrub habitat supporting a variety of unique plant species. Surface aquatic systems are extensive and include freshwater lakes, ponds, and sloughs with highly fluctuating water levels. Dune communities extend the length of the eastern shoreline and are primarily composed of sparse stands of grasses, forbs, and sedges. Human-dominated habitats consisting of isolated residences and historic landscapes comprise a small percent of the island.

The aquatic and terrestrial fauna of the island are diverse. More than 300 bird species use the seashore during the year, and more than 100 species are known to nest there. The island provides habitat for a variety of mammals, including the white-tailed deer, raccoon, river otter, and bobcat. More than 50 species of herpetofauna are present. American alligators are abundant, and the nesting population of the federally threatened loggerhead sea turtle is the most significant along the Georgia coast. Feral populations of hogs and horses roam freely on the island, and while Cumberland Island National Seashore has established the objective of eradicating the hog population, feral horses currently are not managed.

For more than 4,000 years human visitors and residents have interacted with and relied on the natural resources of Cumberland Island. Numerous shell middens throughout the island and ceramic shards provide the most conspicuous clues to a complex American Indian population that prospered here for generations. At the time of European contact in the mid-16th century, a Timucuan tribe occupied the island.

[1] The National Park Service defines potential wilderness as lands that possess wilderness characteristics that would normally qualify them for designation within the national wilderness preservation system but contain temporary nonconforming or incompatible conditions or uses that prevent their being immediately designated as wilderness.

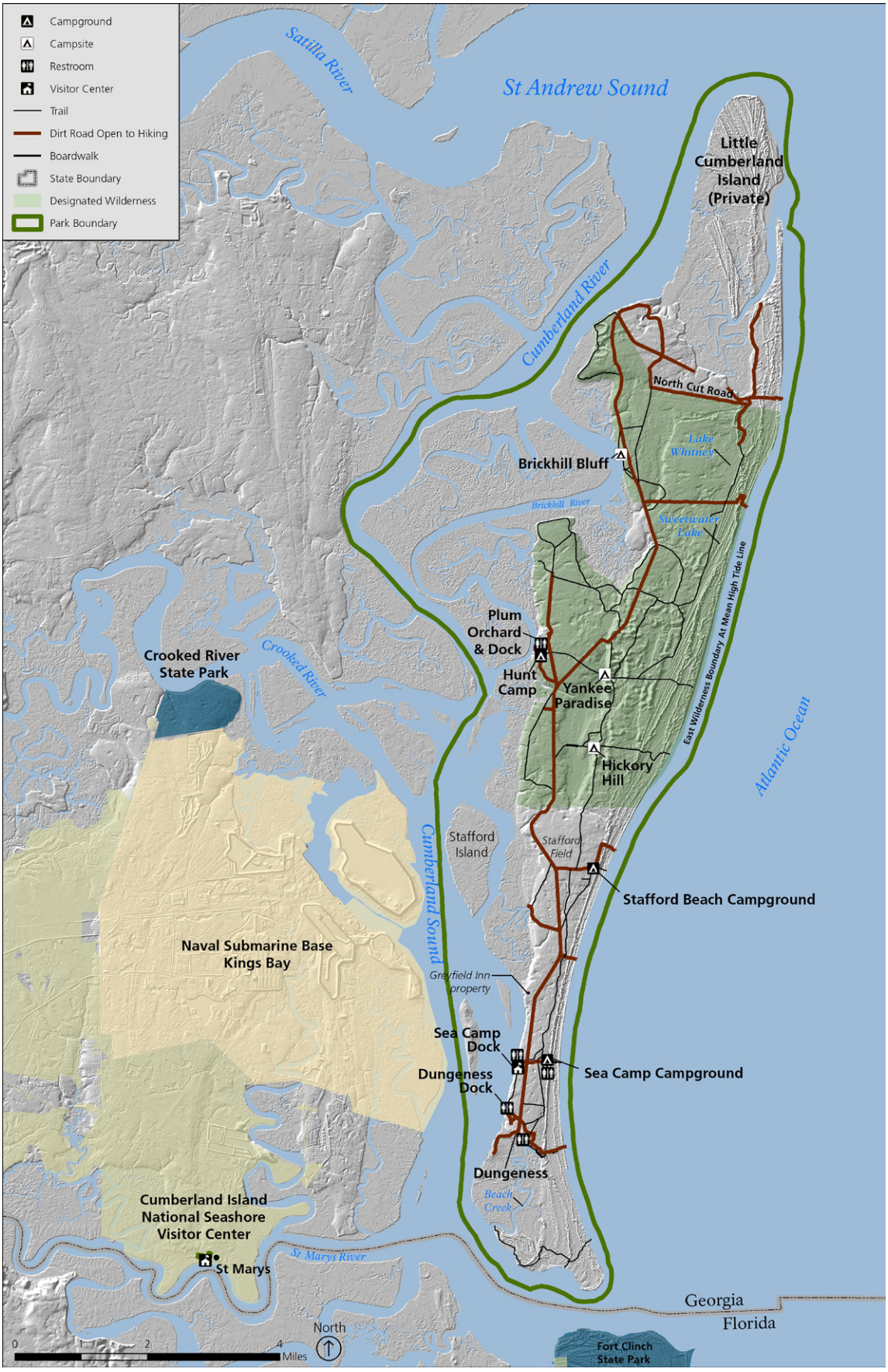


Figure 1. Map of Cumberland Island National Seashore

Starting in the late 1500s, the island was visited by mariners and traders and witnessed the conflict between Spanish and English colonial interests during the late-1600s and 1700s. The plantation agricultural system based on enslaved Africans and the production of monocrops rose to prominence under English colonialism and dominated the island economy and culture for over a century. In 1860, on the eve of the American Civil War, there were approximately 13 plantations profiting from the unpaid labor of approximately 500 enslaved people of African descent.

The Civil War put an official end to slavery and disrupted the agricultural economy of Cumberland Island as formerly enslaved individuals moved to the mainland or purchased some of the land they once were forced to farm. Starting in the 1870s, the island evolved into a recreation destination, with steamboats bringing tourists from the mainland to stay in island hotels and wealthy families purchasing property for their private, seasonal retreats. Gradually, the hotels and resorts gave way to more private retreats. By the mid-20th century, the Carnegie family—the Pittsburgh steel magnates who first came to Cumberland Island in 1881—owned 90% of the island. In 1972, members of the Carnegie family, government officials, environmental organizations, and the National Park Service worked together to establish Cumberland Island National Seashore as a unit of the national park system. When Congress designated Cumberland Island Wilderness in 1982—and expanded the acreage in 2004—it ensured that Cumberland Island's dynamic natural processes would dominate the landscape and that the island's largely undeveloped character would be preserved.[2]

While the National Park Service manages the majority of Cumberland Island, there are a small number of private homes on the western and northern areas of the island that are primarily seasonal residences. Roughly 1,000 acres of Cumberland Island are privately held without restrictions.

CLIMATE CHANGE AND SEA LEVEL RISE

As a barrier island, Cumberland Island is vulnerable to multiple coastal hazards including coastal erosion, storm surge, and sea level rise. At low elevation, the island is frequently inundated with rainwater and surge associated with storms and tidal flooding during exceptionally high tides. Climate change and resulting sea level rise are likely to increase the frequency and magnitude of flooding events in the future (NPS 2016a).

As the sea level rises, the site's vulnerability to coastal storms and the associated surges also increases, putting the island at an elevated risk during severe weather events. Future impacts associated with climate change and sea level rise should be considered when making decisions on the long-term management of Cumberland Island National Seashore. Between 2016 and 2019, Hurricanes Matthew, Irma, and Dorian damaged structures and facilities on the island and in St. Marys. Most recently, the island and its docks were severely damaged from Hurricane Dorian in 2019.

Several recent studies have looked at how the island may be affected by projected future climate change. A *Spatial and Temporal Assessment of Back-Barrier Erosion on Cumberland Island National Seashore, Georgia, 2011-2013* was completed for the park by the US Geological Survey (USGS) in 2016. Research has been conducted to better understand erosion and accumulation processes for the sea-facing side of coastal barrier islands; however, the greater management concern at the park may be the effect that erosion is having on the resources of the island's western shoreline, or the back barrier (USGS 2016). Under a range of sea level rise estimates for the remainder of the 21st century, it was predicted that sites studied along the western shore of the island will be inundated by daily high tides from approximately 20% to 90% of the time, which would be equivalent to an increase from

[2] For a more in-depth history of Cumberland Island's inhabitants and the park, please refer to *Cumberland Island National Seashore: A History of Conservation Conflict,* by Larry M. Dilsaver (2004) *and Cumberland Island: A History,* by Mary Bullard (2005).

between 2 and 45 times the length of current conditions (USGS 2016). It was estimated that the erosional margin across these locations on Cumberland Island will move approximately 120 feet inland from their current position by the end of the 21st century (USGS 2016).

A *Marine Vulnerability Assessment of Cumberland Island National Seashore* was also completed in 2016 by the National Park Service. The study looked at several nearshore marine habitats of interest, all of which were considered highly exposed to sea level rise, particularly the intertidal environments, which are the most vulnerable to changes in sea level (NPS 2016a). Low marsh habitat is found all along the western coast of Cumberland Island. While low marsh habitat is highly vulnerable to sea level rise, this habitat type is also highly adaptable. Most studies agree that with moderate rates of sea level rise, low marshes will be able to keep pace with the rise in water by accumulating sediment or migrating inland; this is especially true in regions with a high tidal range and adequate sediment supply (NPS 2016a), which is similar to conditions at Cumberland Island. However, many studies discuss a "tipping point" or "threshold rate" at which coastal marshes will become submerged due to an inability to keep up with the pace of sea level rise (NPS 2016a). In places like Cumberland Island, where the natural environment is unrestricted and the adjacent lands are suitable, the low salt marsh has the potential to migrate inland as sea level rises. Cumberland Island also has a large tidal range and moderate sediment supply, which have been shown to substantially increase the adaptability of salt marshes to sea level rise by increasing the likelihood that the marsh would gain elevation at a rate sufficient to keep up with sea level rise (NPS 2016a).

Regarding climate change, the overall trends and extremes in temperature are still not as clear as sea level rise, but changes could cause significant problems, particularly for the estuarine habitats on the island. The waters of Cumberland Sound are already negatively affected by increasing water temperature, especially during the summer months. Any increase in water temperature during the summer months could increase the frequency and duration of low dissolved oxygen events, which can cause stress or death among sensitive organisms (NPS 2016a).

Data from a Coastal Facilities Vulnerability Assessment completed by Western Carolina University in 2021 identifies the island as having high sensitivity with 14 structures on the island having moderate or high exposure to sea level rise and storm surge (Peek et al. 2022). These factors are highly likely to affect future access and visitation to Cumberland Island by altering access to many features on the island including shorelines, trails, boardwalks, campgrounds, docks, and kayak routes through impacts on transportation assets and other facilities including bridges, access roads, and docks.

VISITOR USE MANAGEMENT

Visitor use management is the proactive and adaptive process of planning for and managing characteristics of visitor use and its physical and social setting using a variety of strategies and tools to sustain desired resource conditions and visitor experience. Visitor use management is important because the National Park Service strives to maximize opportunities and benefits for visitors while achieving and maintaining desired conditions for resources and visitor experience in a particular area. Managing visitor access and use for visitor enjoyment and resource protection is inherently complex. Managers must acknowledge the dynamic nature of visitor use, the changing types and preferences of visitors, the vulnerabilities of natural and cultural resources, and the need to be responsive to changing conditions.

Proactively planning for visitor use maximizes the ability of agencies to encourage access and protect resources and values. In this plan, visitor use refers to human presence in an area for recreational purposes including education, interpretation, inspiration, and physical and mental health. Visitor use goes beyond the types of activities that people engage in at a park. Visitor use also includes the amount, timing, and distribution of visitor activities and behaviors.

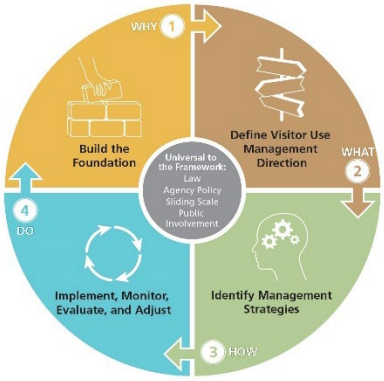


Figure 2. Overview of the VUM Process

THE PLANNING PROCESS

This plan uses the visitor use management framework to develop a long-term strategy for managing visitor use in the park (figure 2). The general planning process used for this plan is outlined below and is consistent with the guidance outlined by the Interagency Visitor Use Management Council (IVUMC, www.visitorusemanagement.nps.gov). Studies conducted by the University of Idaho, Clemson University, Kansas State University, and the University of Vermont also informed the development of the alternatives. These study findings relate to visitor use, the condition of natural resources associated to visitor use, and visitor preferences in the park. For details on where you can find each element of the VUM framework in this plan, see table 1.

Table 1. Visitor Use Management and the Planning Process

Visitor Use Management Framework	Alignment with the Planning Process and Corresponding Chapter Location
Element 1: Build the Foundation	Building the foundation is the first of the four elements of the visitor use management framework. The purpose of this element is to help managers understand what needs to be done, how to organize the plan, and how to define the resources needed to complete the plan. Steps in element 1 include: 1. Clarify the plan purpose and need. (chapter 1) 2. Review the area's purpose and applicable legislation, agency policies, and other management direction. (chapter 1) 3. Clarify the plan purpose and need. (chapter 1) 4. Review the area's purpose and applicable legislation, agency policies, and other management direction (chapter 1) 5. Assess and summarize existing information and current conditions (e.g., current conditions of natural, cultural, and recreation resources and visitor experience opportunities in the area). (chapter 4)
Element 2: Define VUM Direction	The purpose of element 2 is to answer critical questions about what the planning effort is trying to achieve and the acceptable levels of impact from visitor use. Steps in element 2 include: 1. Define desired conditions for the planning area. (chapter 2)

Visitor Use Management Framework	Alignment with the Planning Process and Corresponding Chapter Location
	2. Define appropriate visitor activities, facilities, and services. (chapter 2) 3. Select indicators and establish thresholds. (chapter 3, appendix A)
Element 3: Identify Management Strategies	This element is intended to help managers identify management strategies and actions to achieve and maintain the desired conditions of the plan area. This element also identifies visitor capacity. The goal of element 3 is to define how visitor use would be managed to achieve desired conditions. Steps in element 3 include: 1. Compare and document the differences between existing and desired conditions, and, for visitor use-related impacts, clarify the specific links to visitor use characteristics. (chapter 4) 2. Identify visitor use management strategies and actions to achieve desired conditions. (chapter 3, appendix A) 3. Where necessary, identify visitor capacities and strategies to manage use levels within capacities. (chapter 3, appendix B) 4. Develop a monitoring strategy. (chapter 3, appendix A)
Element 4: Implement, Monitor, Evaluate, and Adjust	Element 4 focuses on implementing management actions, monitoring, evaluating monitoring results, and making adjustments to management strategies and action based on monitoring results. This phase of the planning process focuses on making progress toward meeting desired conditions as well as evaluating potential unintended consequences of the actions for visitors or resources. Steps in element 4 include: 1. Implement management actions. 2. Conduct and document ongoing monitoring and evaluate the effectiveness of management actions in achieving desired conditions. 3. Adjust management actions if needed to achieve desired conditions, and document rationale.

RELATIONSHIP TO OTHER PLANNING EFFORTS

The following plans and actions occurring at the park helped inform the development of this plan.

Foundation Document for Planning and Management (2014). A park's foundation document provides the underlying principles that guided the development of this plan. It identifies what is most important to Cumberland Island National Historic Site (including park purpose and significance), notes special mandates and administrative commitments that affect management of the park, and identifies fundamental resources and values in the park. This plan was designed to be consistent with the park's purpose and significance and information in the foundation plan that ensures the protection of those fundamental resources and values that are related to visitor use would be used to guide the VUM plan. The park foundation document (2014) can be found on the park's website https://www.nps.gov/cuis/learn/management/cumberland-island-management-documents.htm.

General Management Plan (1984). The general management plan provides direction for long-term management of the park including visitor use of the park. Much of this plan is still valid and in effect, including the general measures for the protection of resources and indications for the general developmental goals. This current VUM plan builds on and, in some cases amends the guidance related to zoning/desired conditions and visitor use management including visitor capacity.

North End Access and Transportation Management Plan (2009). The plan was developed as mandated by the Cumberland Island Wilderness Boundary Adjustment Act of 2004 "for the purpose of transporting visitors to and from the historic sites located adjacent to Wilderness." During the transportation management plan (TMP) process an alternative to allow NPS or concessioner guided trips to drive on the beach was considered. However, that alternative was dismissed because of its potential impact on 13 special status species. That exclusion of beach driving would continue.

Long Range Interpretive Plan (2017). The plan provides guidance for interpretive and educational services and programming for Cumberland Island National Seashore. Some parkwide and general actions proposed in this visitor use management plan are described in greater detail in the long range interpretive plan.

PLANNING ISSUES

As defined by the 2015 NEPA handbook, "issues" or "environmental issues" can be problems, concerns, conflicts, obstacles, or benefits that would result if the proposed action or alternatives, including the no-action alternative, are implemented. Issues may be raised by the National Park Service, other agencies, tribal governments, or the public.

The analysis in this plan focuses on significant issues (meaning pivotal issues or issues of critical importance). During scoping for this plan, the interdisciplinary team identified a number of VUM issues and opportunities that would be addressed as part of the planning effort. These planning issues were then presented to the public during civic engagement meetings in April 2019. The public provided feedback on these issues that further refined how they were described. As a result of this process, the following issue statements were identified:

- Visitor Capacity. Although the park has a daily visitation limit—identified in the 1984 GMP as approximately 300 visitors per day—it does not have a comprehensive visitor use plan that considers a variety of current and potential visitor opportunities on the island or identifies related visitor capacities for specific areas and visitor uses. In addition, the current restrictions of the ferry delivery number may indirectly pose socioeconomic barriers to visitation. This planning effort further evaluates the ferry delivery and explores opportunities for providing more equitable access to the island.
- Visitor Access. The majority of park visitors arrive on Cumberland Island via the NPS concessioner-operated ferry and recent use patterns show an increasing number of visitors arriving by private vessels. Appropriate locations for private vessels should be defined to ensure positive visitor experiences and resource protection. There are also opportunities to analyze more flexible ferry schedules that could support a variety of on-island itineraries and increase the diversity of recreational opportunities or means of access to appeal to a wider spectrum of park audiences. These increased opportunities may potentially help diversify visitor demographics—currently 87% of park visitors are white (Brownlee et al. 2019)—and promote equal opportunities for recreation.
- Updated Management Guidance. The management zoning included as part of the 1984 GMP does not provide enough detail to inform decisions of park managers regarding appropriate visitor uses and resource conditions. In some areas, management zoning is outdated and no longer reflects NPS management strategies, land ownership, or other realities. Desired conditions and updated management zoning are needed to guide future park decisions related to visitor use and facilities.
- Analysis of New and Emerging Visitor Services. Members of the public, park staff, and potential visitors occasionally suggest that the park consider providing additional visitor uses

and services either through commercial use providers or through NPS facilities. There is a need to evaluate the accessibility of facilities and recreational opportunities to ensure that activities and services provided to all visitors are consistent with section 504 of the Rehabilitation Act of 1973 (PL 93-112). Desired conditions and updated management zoning should guide conversations about existing and potential activities and services. The park needs criteria that help determine what future commercial services may be necessary and appropriate to support on-island visitor use based on analysis of relevant laws and policy.

- Balancing Wilderness Character and Visitor Experience. Approximately 20,617 acres of Cumberland Island National Seashore—9,907 acres of designated wilderness and an additional 10,710 acres of potential wilderness—are managed to protect the four qualities of wilderness character: untrammeled, natural, undeveloped, and solitude or primitive and unconfined recreation. The "primitive, undeveloped character" of Cumberland Island is referenced in the park's 2014 foundation document and was mentioned in many of the public comments received during the planning process. The National Park Service is required to preserve the qualities of wilderness character.

IMPACT TOPICS ANALYZED IN THIS VUM PLAN/EA

An important part of effective planning is understanding the consequences of making one decision over another. Environmental assessments, such as this document, identify the anticipated impacts of possible actions on resources and on park visitors and neighbors. Impacts are organized by topic, such as impacts on visitor experience or impacts on vegetation. Impact topics focus the environmental analysis and ensure the relevance of impact evaluation. The following impact topics identified for the VUM plan were identified based on the issues addressed in this document and have been analyzed in chapter 4:

- Vegetation
- Wetlands
- Special Status Species
- Character of Designated and Potential Wilderness
- Visitor Use and Experience
- Socioeconomics

Topics discussed by the interdisciplinary planning team and ultimately dismissed from detailed analysis are briefly described in appendix K.

CHAPTER 2: GENERAL VISITOR USE MANAGEMENT DIRECTION

INTRODUCTION

This chapter outlines the general visitor use management direction for the park. The general management plan for the park provides high-level guidance on how the park would be managed. This chapter expands on the general management plan and describes the vision for visitor use management at Cumberland Island National Seashore. This includes descriptions of park zoning and desired conditions. Additionally, this chapter documents the necessary and appropriate determination for commercial uses and services and criteria for evaluating new and emerging uses.

ZONING AND DESIRED CONDITIONS

Management zones as defined in the 1984 general management plan serve as the foundation for this chapter. The general management plan includes four management zones based on a generalized NPS system of management—a natural zone, development zone, historic zone, and special use zone.

In the general management plan, the entirety of the natural zone consists of four subzones—a wilderness subzone, a potential wilderness subzone, a natural environment subzone, and an environmental protection subzone. For this planning effort, the subzones were elevated to zones, thereby eliminating the additional layer that the natural zone represented.

The special use zone was expanded to include all areas that have some level of private, legal, or otherwise binding attachment to lands (including reserved rights properties) within the park boundary. It has been renamed as the private interest zone.

The zoning described in the general management plan does not provide enough detail to inform the decisions of park managers regarding appropriate visitor uses and resource conditions. Therefore, this plan provides greater detail to the zones through the use of desired conditions. Desired conditions are statements of aspiration that describe visitor experiences and opportunities, resource conditions, and facilities and services that the National Park Service strives to achieve and maintain in a particular area.

Desired conditions help park managers answer the question "what are we trying to achieve?" They qualitatively describe an ideal condition for park resources and values and are focused on fundamental resources and values; the visitor experience opportunities associated with them; and the types and levels of management, development, and access that would be appropriate in a particular location. The desired conditions developed for this plan were based on guidance from previous planning efforts (2014 Foundation Document, 1984 GMP, 2009 North End Access and Transportation Management Plan, cultural landscape reports, and others). Other NPS policies and guidance, including the IVUMC Visitor Use Management Framework, and examples from other planning efforts were also used in the development of desired conditions for this plan.

It should be noted that the desired condition statements below describe what conditions and outcomes are to be achieved and maintained in the future. They do not attempt to answer the question of how those conditions or outcomes would be achieved. Actions and management strategies to achieve these desired conditions are described in "Chapter 3: Alternatives."

Desired Conditions by Zone

The desired conditions developed for this plan are included below and are organized by zone. The zone descriptions are drawn from the 1984 general management plan and have been edited for

clarity and consistency. For all desired conditions referring to "visitors," the word is inclusive of diverse populations and people with disabilities. Park staff's intention is to cultivate diverse, equitable, and accessible opportunities for all visitors.

Parkwide. The following desired conditions apply to all zones described in the general management plan and therefore apply parkwide.

Visitor Experience and Opportunities

- Visitors have opportunities for active and passive recreation in an uncrowded setting that is consistent with the values for which the unit was established.
- Visitors have opportunities for a diversity of experiences, including day use and overnight use experiences, water-based and land-based experiences, and experiences in different parts of the island.
- Visitor use levels are managed to maintain a setting that is consistent with the values for which the unit was established.

Resources

- Visitor use does not impede the ability to maintain the biodiversity of the intact barrier island system.
- Visitor use does not degrade the integrity of the island's historic and prehistoric features and values.

Facilities and Services

- Compatible visitor services and facilities are provided to support appropriate recreational uses.

Wilderness Zone and Potential Wilderness Zone (formerly subzones of the Natural Zone). The wilderness zone includes 20,617 acres of wilderness and potential wilderness lands, marshes, and waters described in PL 108-447. This includes most of the island north of Stafford, with the exception of uplands on Little Cumberland Island. The salt marsh islands west of Cumberland, exclusive of large tidal creeks, are classified as potential wilderness. Qualified lands not now under federal ownership, but that may in time be obtained through federal acquisition, are classified as potential wilderness. Wilderness legislation includes a clause to automatically include these lands when they become available.

Some reserved rights are in designated wilderness; however, the properties would not function as wilderness until the reserved rights have expired. As these reserve tracts come under full NPS management and nonconforming uses cease, they would automatically be designated wilderness.

Visitor Experience and Opportunities

- Wilderness provides opportunities for low-density experiences consistent with wilderness values. Visitors have the opportunity to experience solitude, remoteness, risk, challenge, and self-reliance.
- Visitors have the opportunity to understand wilderness character and values.

- Visitors have the opportunity to experience the primitive recreation and undeveloped character of isolated areas of the island and appreciate environments that are ruled by natural forces and processes.
- Visitors have the opportunity to gain an appreciation for the diversity of habitats on the island and their significance.
- Visitors have the opportunity to experience pristine and expansive stretches of beach and to understand the significance of this resource.
- Visitors have the opportunity to gain an appreciation for the deep, lush, live oak maritime forests and the associated untamed atmosphere.

Resources

- Visitor use is managed such that wilderness character and values are preserved.
- Natural resources and processes in this zone remain largely unaltered by direct human activity.

Facilities and Services

- Trails and campsites are as primitive and undeveloped as possible given the resource conditions. Other infrastructure includes only those services and facilities necessary to support resource protection.

Environmental Protection Zone (formerly subzone of Natural Zone). Lands on the south end of the island, including the South End Flats and South End Beach areas, are of particular value as wildlife habitat and have been classified in an environmental protection zone.

Visitor Experience and Opportunities

- Use types in this zone are consistent with prioritizing resource protection goals and protecting low density and low impact recreational experiences.

Resources

- Use would be managed to perpetuate wildlife (i.e., shorebirds, marine mammals) values with little human intrusion.
- Natural resources and processes in this zone remain largely unaltered by direct human activity.

Facilities and Services

- In the environmental protection zone, trails and campsites are as primitive and undeveloped as possible given the condition of the resources. Only minimally developed and moderately developed trails (classes 1 and 2) are appropriate for this zone. Other infrastructure includes only those services and facilities necessary to support resource protection and visitor safety (e.g., wells at campsites).
- In the environmental protection zone, infrastructure includes only that which fulfills a critical need based on the need to protect resources where other mitigations are not feasible or practical.

Natural Environment Zone (formerly subzone of Natural Zone). Lands in public use areas that are used for environmentally compatible recreation activities south of Stafford are classified in a natural environment zone. This zone surrounds debarkation points, picnic areas, campgrounds, and private inholdings. Open waters surrounding the island on the ocean side, larger tidal creeks in the marshes to the west, and waters in the Cumberland Sound and Cumberland River to the Intracoastal Waterway would be classified in this zone and managed to allow activities that are protective of the natural environment.

Visitor Experience and Opportunities

- Active recreational opportunities dominate in the natural environment zone.
- Opportunities for low-density experiences are provided in the natural environment zone.
- Visitors have the opportunity to gain an appreciation for the diversity of habitats on the island and their significance.
- Visitors have the opportunity to gain an appreciation for the deep, lush, live oak maritime forests and the associated untamed atmosphere.
- Visitors have the opportunity to experience pristine and expansive stretches of beach and to understand the significance of this resource.

Resources

- Natural resources and processes in this zone remain largely unaltered by direct human activity.
- Visitor impacts are kept to a minimum.
- Infrastructure to support visitor use does not impact the undeveloped quality of the intact dune system.
- Visitor use does not detract from the distinctive charm and aesthetics of live oak maritime forest resources and does not impact the overall health and integrity of the forest system.
- Visitor use does not impact the overall health and integrity of ecosystems.

Facilities and Services

- Visitor services and facilities compatible with the zone's primitive and undeveloped character are provided to support appropriate recreational uses.
- Trails are compatible with the natural environment. Infrastructure related to trails should support visitor use and protection of resources (e.g., boardwalks). Some hardening of trails (to provide Architectural Barriers Act Accessibility Standard [ABAAS]-compliant access) may be appropriate if consistent with park zoning and resource-protection goals.
- Some commercial use is appropriate, consistent with resource and experience desired conditions of this area.

Historic Zone. Historic properties that are listed in or are eligible for the National Register of Historic Places (NRHP) include buildings, structures, objects, and archeological sites that are found throughout the island. These include six historic districts (High Point-Half Moon Bluff, Plum Orchard, Stafford Plantation, Dungeness, Rayfield Archeological District, Table Point Archeological District, and the privately held Greyfield). These resources are captured in the Historic zone. Additional historic properties, including individual resources, are scattered throughout the island in other management zones.

Visitor Experience and Opportunities

- Visitor recreation is generally contemplative, quiet, and consistent with the historic context in the historic resources zone.
- Visitors gain an understanding of the significance of the island's 4000-year history and the diversity of cultures and activities on the island through time.
- Visitors have the opportunity to understand the significance of national register listed and eligible archeological districts and other significant archeological resources.
- Visitors are provided with the opportunity to understand the significance of national register listed and eligible historic districts, as well as the context and history of the island, regardless of physical access.
- Visitors learn about and develop a respect for the sensitivity of cultural sites.

Resources

- Treatment of and access to structures and landscapes done in a way that is sensitive to the historic and ecological context.
- Visitor use, services, and facilities do not conflict with or impact archeological sites.
- Integrity of historic districts are not impacted by visitor use.

Facilities and Services

- Visitor use, services, and facilities do not conflict with or impact archeological sites or the integrity of historic features.
- Commercial and special-use permits may be issued for the use of historic zones, as appropriate.
- Appropriate visitor services are provided, including some commercial services.
- Educational opportunities exist in this zone, including programs for school groups.

Development Zone. The development zone includes debarkation sites at Dungeness and Sea Camp, improved campgrounds, picnic areas, visitor facilities, roads, NPS housing and operations/administration areas. These areas serve the needs of visitors and management of the park.

Visitor Experience and Opportunities

- Opportunities for higher-density visitor experiences—where most visitor services would be appropriate—are provided in the development zone.
- Active recreational opportunities dominate in the development zone.

Resources

- Visitor use, services, and facilities do not impact archeological sites or detract from the distinctive charm and aesthetics of the maritime forests and undeveloped quality of the dune system or can be mitigated to reduce impacts.

Facilities and Services

- Commercial and special use permits may be issued for uses in this zone, as appropriate.
- Administrative support facilities are appropriate in this zone.
- Visitor services and facilities are provided to support appropriate recreational uses.

Private Interest Zone (formerly Special Use Zone). The private interest zone includes areas that have some level of private, legal, or otherwise binding attachment to lands within the park boundary. This includes private fee simple property on Little Cumberland Island as well as fee simple tracts on Cumberland Island. The zone also includes reserved estate properties on Cumberland Island where the relevant parties, upon selling their property to the federal government, were granted rights of use and occupancy. All remaining reserve properties on the island are life agreements. The two airstrips on the island, Stafford Field and High Point, are included in the zone as well. These airstrips, regardless of land ownership, are for the use of private residents and not the general public. Conditions in reserved estate properties are dictated by rights of use and occupancy established between the rights holder and the US Department of the Interior (DOI).

Conditions on Little Cumberland Island are mandated by the 1975 agreement between the Little Cumberland Island Homes Association, Inc., and the DOI. Private, fee simple land conditions on Cumberland Island are regulated by local, state, and federal laws and regulations, including zoning and building codes.

Changes to Zoning Locations. The current zoning as defined in the 1984 general management plan is in some areas outdated and no longer accurate or reflective of the park's management strategies, land ownership, or other realities. In the more than 35 years since the development of the general management plan, inventories of park resources have occurred, providing managers with much more information than was previously available. In addition, visitor activities and experiences have changed as well as some NPS policies.

This plan includes changes to the park zoning of specific locations so that the zoning scheme is consistent with the actions presented in this plan. These changes (summarized in table 2 and depicted in figure 3) are considered amendments to the park's general management plan. Any development would adhere to the desired conditions for the newly designated zone of the site.

Table 2. Changes to Zoning

#	Area	GMP Zone	Newly Identified Zone	Rationale
A	Little Cumberland Island	Potential Wilderness Subzone	Private Interest Zone	Updated to correct 1984 GMP map
B	Halfmoon Bluff	Potential Wilderness Subzone	Historic Zone and Wilderness Zone	Updated to reflect 2004 wilderness legislation map

#	Area	GMP Zone	Newly Identified Zone	Rationale
C	Hunt Camp	Historic Zone	Historic Zone and Development Zone	Updated to depict historic and current use
D	Hickory Hill, Yankee Paradise, and other sites in wilderness and potential wilderness	Development Zone	Wilderness Zone	Updated to depict historic and current use
E	Stafford Area	Historic Zone, Special Use Zone, and Natural Environment Subzone	Historic Zone, Private Interest, Zone, and Natural Environment Zone	Updated to depict current use and ownership
F	Greyfield Area	Development Zone, Historic Zone, and Natural Environment Subzone	Private Interest Zone	Updated to depict current use and ownership
G	Dungeness Area	Special Use Zone	Historic Zone and Natural Environment Zone	Former reserved rights properties updated to depict current use and ownership
H	South End	Historic Zone	Environmental Protection Zone	No archeological evidence of Fort Prince William exists
I	South End Beach	Natural Environment Subzone	Natural Environment Zone and Environmental Protection Zone	Environmental Protection Zone extended to protect critical bird nesting habitat
J	Drum Point Island	Environmental Protection Subzone	Natural Environment Zone	Outside park jurisdiction

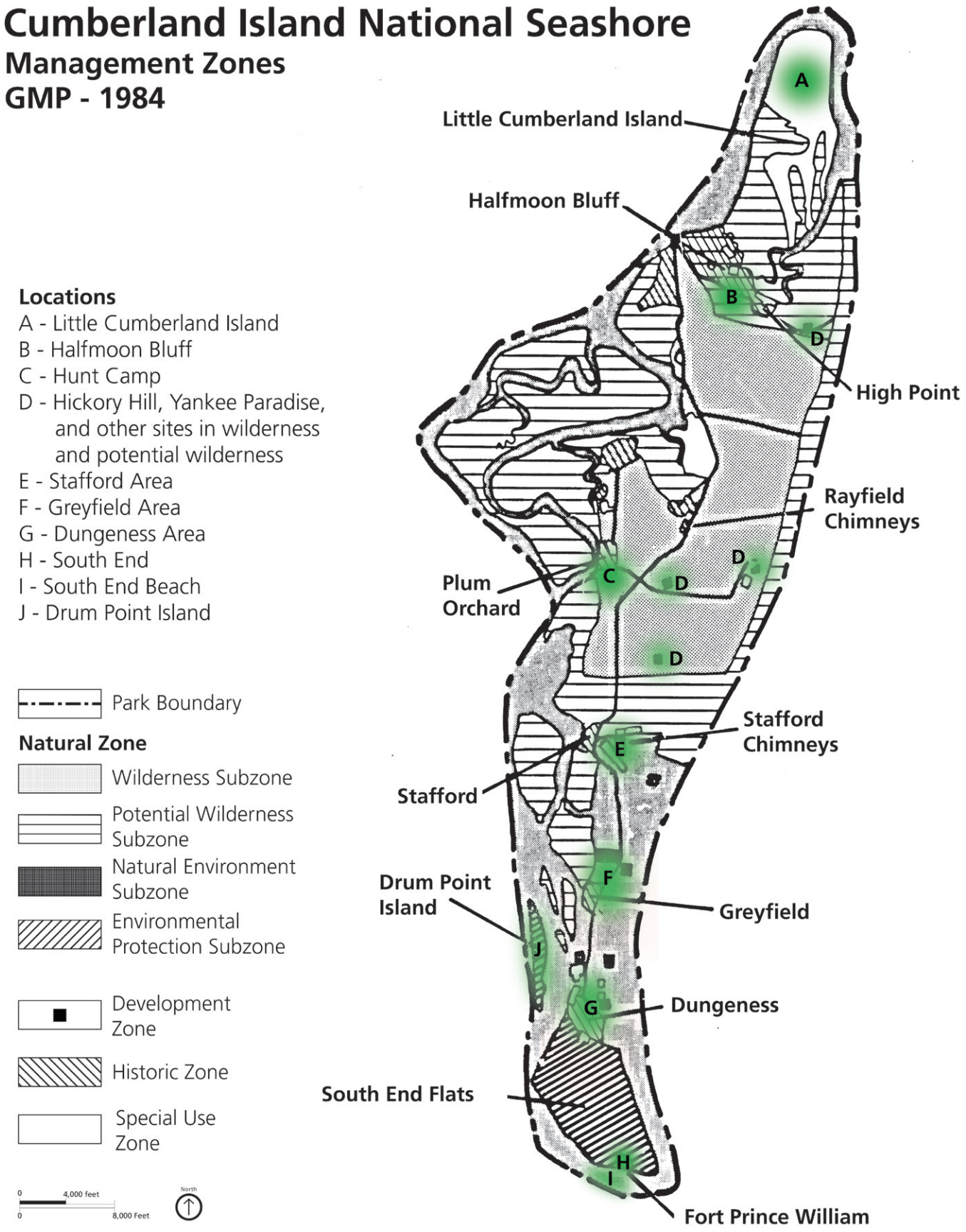


Figure 3. 1984 GMP Management Zones

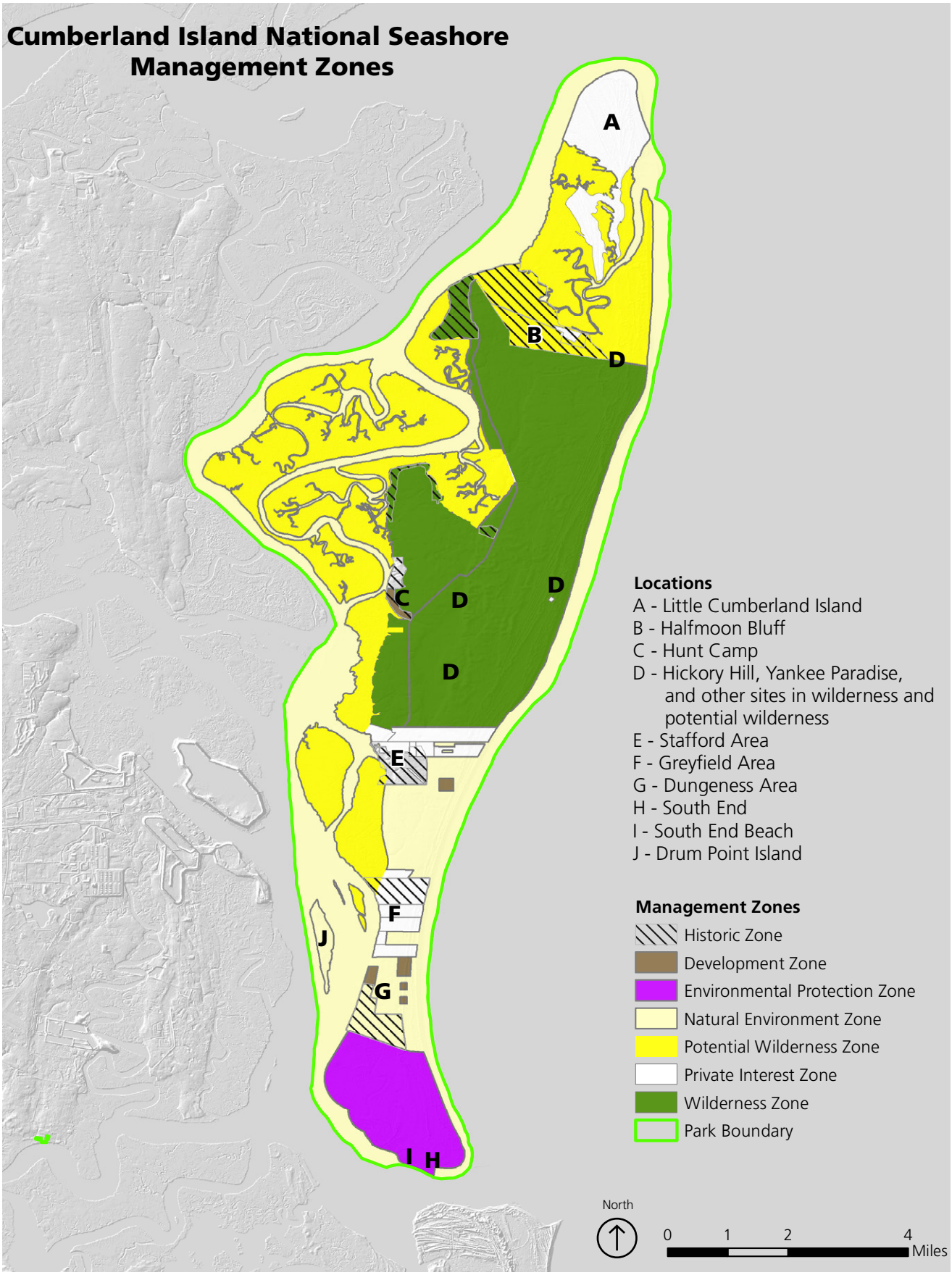


Figure 4. Updated Management Zones

COMMERCIAL VISITOR SERVICES ANALYSIS

Commercial visitor services are defined as any activity or service that occurs in a park for which compensation is made. The two most common mechanisms for delivering commercial visitor services are concessions contracts and commercial use authorizations (CUAs). Concession contracts are typically 10-year agreements for larger commercial activities, granted after a competitive solicitation process. Commercial use authorizations are shorter-term permits authorizing commercial services to park visitors.

The 1998 Concessions Management Improvement Act (PL 105-391) governs commercial visitor services within units of the national park system. The act states that contracts for visitor facilities and services "be limited to those that are necessary and appropriate for public use and enjoyment" of the national park area in which they are located.

Necessary and appropriate criteria help parks determine which commercial visitor services would enhance the visitor experience without negatively impacting the park or its ability to carry out its mission.

Appropriate criteria provide insight into the fundamental resources and values of the park and consider potential negative impacts of commercial visitor services the park must prevent. Commercial visitor services must meet all of the appropriate criteria to operate in the park:

- Consistent with park purpose and significance.
- Consistent with laws, regulations, and policies.
- Does not compromise public health and safety.
- Does not cause unacceptable impacts on park resources or values.
- Does not unduly conflict with other park uses and activities.
- Does not exclude the general public from participating in recreational opportunities.

While commercial use authorizations may be implemented if the commercial service meets all of the *appropriate* criteria above, concession contracts may only be granted for services that also meet one of the *necessary* criteria below. These criteria consider how a commercial service may enhance visitor experience and help the park achieve its goals and mission:

- Contributes to visitor understanding and appreciation of the park's purpose and significance.
- Enhances visitor experiences consistent with the park's purpose and significance.
- Assists the National Park Service in managing visitor use and educating park visitors.
- Provides an essential service or facility not available within a reasonable distance from the park.

Commercial visitor services should be consistent with the park's zoning and management guidance, as previously described. The interdisciplinary team used the necessary and appropriate criteria to evaluate new and emerging commercial visitor services. Tables 3 through 5 summarize the commercial services considered and evaluated against the criteria. All requests for special use permits and leasing opportunities would be evaluated following guidance from NPS Management Policies and in accordance with 36 CFR 5.3 and 36 CFR 18, respectively. Additional details can be found in appendix E. Commercial services must also be evaluated and authorized pursuant to the Wilderness Act of 1964 (PL 88-577), Special Provisions, Section 4(d)(5) provides that "commercial

services may be performed in the wilderness areas designated by this act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas." See appendix F for the Extent Necessary Determination analysis. Park staff would work with commercial operators to ensure that provided services are consistent with section 504 of the Rehabilitation Act of 1973 (PL 93-112). This act requires program accessibility in all services that are provided with federal dollars. Therefore, not only should commercial operators provide accessible means of access to the island, but any commercial service provisions should enable people with disabilities to receive the same benefits as those received by other visitors.

Table 3. Evaluation of Current Commercial Services by Appropriate and Necessary Criteria

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Ferry Service: St. Marys – Cumberland Island	Yes	Yes
Charter Service: St. Marys and Plum Orchard Dock for public hunts	Yes	Yes
Cart Rental	Yes	Yes
Lands and Legacies Tour	Yes	Yes
Bicycle Rental	Yes	Yes
Limited Food and Beverage on Ferry	Yes	Yes
Passenger Ferry Service: St. Marys – Plum Orchard Dock, twice per month	Yes	Yes
Charter Service to Cumberland Island from St. Marys, Georgia, and Fernandina Beach, Florida	Yes	Yes
Water Taxi Service between St. Marys, Georgia, and Fernandina Beach, Florida	Yes	Yes
Day Use Education Programs	Yes	Yes
Guided Walking / Hiking Tours	Yes	Yes
Guided Nonmotorized Boat Tours	Yes	Yes
Guided Motorized Boat Tours	Yes	Yes
Special Events	Yes	No
Bookstore on Mainland	Yes	Yes

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
South-End-Only Shuttle Service	Yes	Yes

Table 4. Evaluation of Potential Commercial Services by Appropriate and Necessary Criteria

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Camp Store on Island	Yes	Yes
Managed Overnight Program	Yes	Yes
No-motorized Boat Rental on Island	Yes	Yes
Nonmotorized Boat Tours on Island	Yes	Yes
Vehicle Tours	Yes	Yes
Motorized Boat Tours on Island	Yes	Yes
Photography Tours/Classes	Yes	No
Guided Fishing	Yes	No

Table 5. Evaluation of Deferred/Dismissed Commercial Services by Appropriate and Necessary Criteria

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Horseback Riding	No, future reconsideration	No, future reconsideration
Motorized Boat Rental on Island	No	No
Food and Beverage – Mainland	No	No
Food and Beverage – Island	No	No

CHAPTER 3: ALTERNATIVES

INTRODUCTION

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act require federal agencies to explore and objectively evaluate all reasonable alternatives and briefly discuss the rationale for eliminating any actions that were not considered in detail. This chapter describes the no-action alternative and proposed action alternative that would meet the purpose and need of this management plan.

DEVELOPMENT OF THE ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

The National Park Service relied on previous planning documents—including the park foundation document and general management plan—for guidance in developing the proposed action alternative. Combined, these documents and the desired conditions developed as part of this planning effort, provide clear direction about what kind of place the park should be—its overall character in terms of resource conditions and visitor experience.

Public input informed the development of the proposed action alternative. The public outreach process helped the National Park Service understand the public's values and preferences regarding visitor experience in the park and concerns, issues, and suggestions for future visitor opportunities on Cumberland Island. The main ideas reflected in the comments relate to the level of park development, wilderness character, and protection of natural resources.

The proposed action alternative must meet the purpose and need for the plan as described in chapter 1. The purpose and need were developed through careful analysis of comments received during public outreach, review of the park's previous planning documents, and input from NPS staff from varying disciplines. Once the purpose and need were articulated, the National Park Service considered a range of strategies that would address park visitor use management in light of park-identified desired conditions. A preferred alternative is the alternative that best accomplishes the purpose and need of the proposed action while fulfilling the statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. In this management plan, the proposed action alternative (alternative 2) and the preferred alternative are one and the same and it is referred to interchangeably.

INDICATORS AND THRESHOLDS

This plan establishes indicators and thresholds. Indicators measure conditions that are related to visitor use, and monitoring is conducted to track those conditions over time. Thresholds are minimally acceptable conditions associated with each indicator. The results of monitoring are used to inform and select strategies to be used by park managers to achieve and maintain desired conditions. This iterative practice of monitoring, implementing potential management strategies, and then continuing to monitor to gauge the effectiveness of those actions allows park managers to maximize benefits for visitors while achieving and maintaining desired conditions for visitor experience and resource conditions in a dynamic setting.

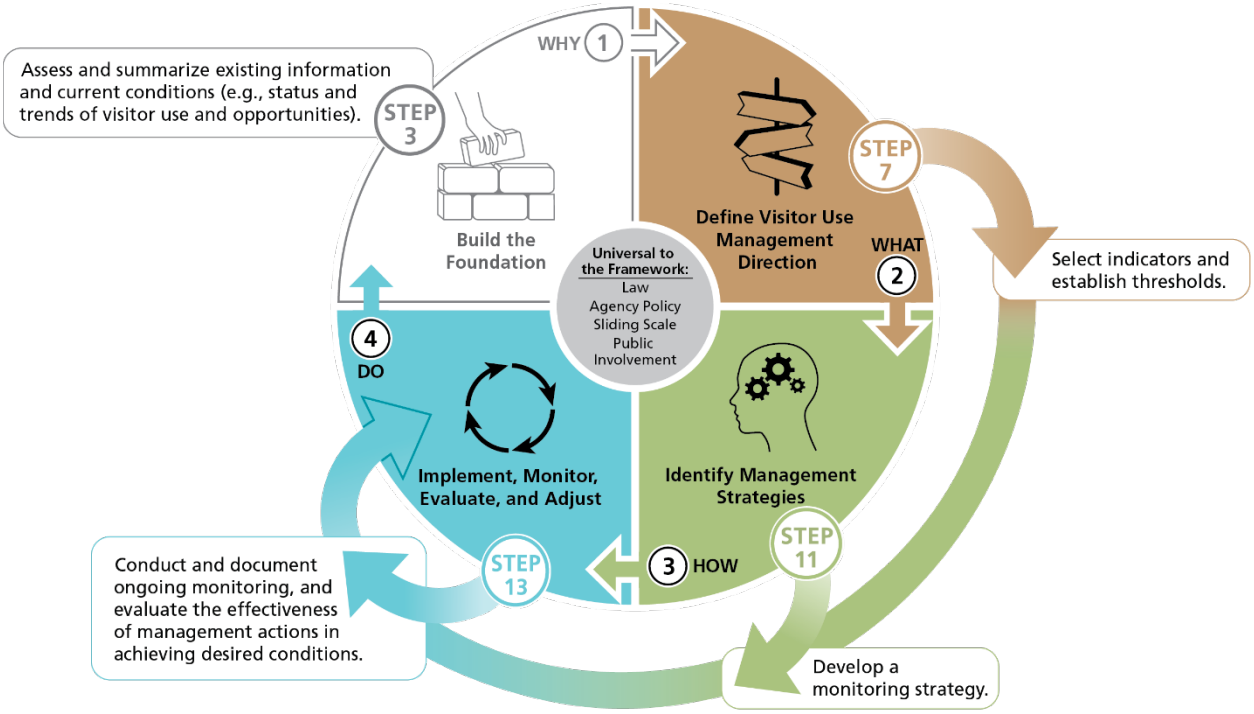


Figure 5. Monitoring Process of the IVUMC Framework

[NOTE: Monitoring is iterative in nature. In the context of the VUM Framework, it includes the selection of indicators and thresholds (Step 7), the development of a monitoring strategy (Step 11), and ongoing monitoring to evaluate effectiveness of management actions (Step 13). This ongoing monitoring can inform future indicators and thresholds as well as the selection of management strategies.]

Indicators that would be implemented as a result of this planning effort are described below and are considered part of the NPS preferred alternative. For a complete discussion of thresholds, triggers, rationale, and associated potential management strategies, see appendix A.

1. **Indicator:** Number of people entering posted closures (temporary or permanent) of sensitive shorebird areas.
2. **Indicator:** Number of people per viewshed at Nightingale Beach.
3. **Indicator:** Number of people encountered on trails per day in designated wilderness.

These three indicators would be used to monitor visitor experience and resource conditions throughout the park. A monitoring program and field protocols for tracking these indicators would be developed subsequent to this plan and prior to implementing management actions. These indicators would help show when conditions of resources and crowding at key sites are approaching thresholds, and therefore could be indicative of conditions that are not consistent with the desired conditions and fundamental resources and values of the park. If these conditions approach their respective triggers or thresholds, action may be taken to address visitor use issues in the park.

VISITOR CAPACITY

The primary goal of this VUM plan is to preserve the fundamental resources and values of Cumberland Island. The amount, timing, distribution, and types of visitor use on Cumberland Island influences both conditions of fundamental resources and visitor experience.

The visitor capacities for this plan are considered part of the proposed action alternative. Visitor capacity is defined as the maximum amounts and types of visitor use that an area can accommodate, while achieving and maintaining the desired resource conditions and visitor experience that are consistent with the purposes for which the area was established (IVUMC 2016). By identifying visitor capacities and managing the amounts and types of use within those capacities, the National Park Service can better protect resources and provide visitors with opportunities for high-quality experiences. Identification of visitor capacities, and strategies to manage to these capacities, is also directed by the National Parks and Recreation Act of 1978. To identify the appropriate amounts and types of use at key areas, a variety of data was reviewed to recognize current conditions compared to desired conditions for the area. The visitor capacity identification also takes into consideration management objectives and strategies being implemented for an area. If the visitor capacity analysis identified any additional actions needed to manage visitor capacities, these actions were added to the proposed action alternative.

The full analysis of visitor capacities related to this planning effort is included as appendix B, and two summary tables of identified capacities are included below.

Table 6. Visitor Capacity Summary for Key Locations

Analysis Area	Visitor Capacity
Nightingale Beach	69 people at one time (PAOT) /mile of beach
Stafford-Greyfield Beach	24 PAOT / mile of beach
Jetty Beach	24 PAOT / mile of beach
North Beach	12 PAOT / mile of beach
South End Beach	60 PAOT in the open portion of South End Beach (the visitor capacity for the closed area to the west of the beach access area is 0 PAOT)
Dungeness Ruins	92 PAOT
Plum Orchard	115 PAOT: 70 PAOT in the mansion 45 PAOT on the grounds
Settlement	33 PAOT, 100 people per day: 9 PAOT inside the First African Baptist Church 12 PAOT in the immediate vicinity 12 PAOT in other areas
Wilderness	210 PAOT: 72 PAOT in campsites 138 PAOT on trails

Table 7. Visitor Capacity Summary for Other Locations

Analysis Area	Visitor Capacity
Sea Camp Campground	148 people per night: 90 visitors in individual sites per night 40 visitors in group sites per night 18 users in administrative sites/night
Dungeness Dock	200 PAOT
Sea Camp Dock	200 PAOT
Stafford Campground	36 people per night
Stafford / Little Greyfield Area	12 people at one time
Hunt Camp	18 people per night
Beach Creek Campsites	18 people per night
Beach Creek	20 motorized boats per day, and 20 nonmotorized boats per day
Southern Uplands	12 people at one time
Mainland Museum	35 people at one time
Mainland Visitor Center	50 people at one time

Ferry Delivery

Management of daily ferry delivery to the island is crucial to maintaining and protecting the desired experience and resource conditions of the park. It is also an important aspect to managing the amounts and types of use in the identified visitor capacities for key areas and ensuring thresholds are not exceeded. Management of daily ferry delivery to the island is considered part of the proposed action alternative. The framework park managers would use to identify how many passengers the ferry service can deliver to Cumberland Island per day is discussed in appendix C.

Based on the analysis in appendix C, the park may increase daily ferry delivery to the island from current levels without adversely impacting desired conditions, exceeding thresholds, or exceeding visitor capacities. The analysis in appendix C estimates that the ferry could deliver approximately 600 people per day to the Dungeness and Sea Camp docks combined. In addition to the 600 people delivered to the Sea Camp and Dungeness area, the analysis estimates that another 100 people per day could be delivered directly to Plum Orchard if ferry service to that location is established under the preferred alternative. The number of people delivered to the island by ferry each day would be managed incrementally and adaptively. As the plan is implemented and additional visitors are delivered to the island each day, two key indicators (PPV at Nightingale Beach and encounter rates in wilderness) would be monitored. If conditions approach their respective thresholds for these indicators, park managers may make adjustments to ferry delivery in terms of the daily delivery number, timing of delivery, and spatial distribution of delivery by working with the concessioner.

ALTERNATIVE 1 (NO-ACTION ALTERNATIVE)

The no-action alternative is the continuation of current management actions and direction into the future; that is, continuing with the present course of action until new guidance changes that course of action. The no-action alternative, as required by NEPA, also serves as a baseline with which to

compare the effects of the action alternative with those of the status quo. Current management is described in the following table (table 8). A map of alternative 1 follows the table (figure 6).

Table 8. Alternative 1 (No-Action Alternative)

Area / Management Topic	Description of Current Management
Designated Wilderness Camping	The park provides wilderness camping opportunities at three designated campsites: Brickhill Bluff, Yankee Paradise, and Hickory Hill. Wilderness campsites consist of small, cleared spaces and wells, but no other infrastructure or development. Sites at Yankee Paradise and Hickory Hill are accessible by foot while the Brickhill Bluff site can be accessed via land or watercraft. The designated wilderness sites are administered through a permit system managed by Recreation.gov; permits are available for up to 4 parties of 6 people per designated campsite at one time. Under current management, up to 72 people may camp in the designated wilderness at one time (3 sites x 4 parties x 6 people = 72 campers).
Backcountry Camping	The park provides visitor backcountry camping opportunities at Stafford Beach Campground. The campground includes a restroom/bathhouse and simple amenities at each site such as fire rings and food storage. There are 10 designated sites, but only 6 sites are available to reserve at any one time to allow individual sites to recover from visitor use. The sites are administered by permits available through Recreation.gov; reservations can be made for 1 party of up to 6 people per available campsite. Under current management, up to 36 people may camp at Stafford Beach Campground at one time (6 available sites x 6 people = 36 campers). Registered hunters use Hunt Camp campground at Plum Orchard for backcountry camping while participating in managed hunts. Hunt Camp campground is also used for administrative/operational purposes to base volunteer groups working in the backcountry. This site is not currently open for reservations or use by the general public.
Sea Camp Campground (frontcountry camping)	The park provides frontcountry visitor camping opportunities at Sea Camp Campground. Designated campsites include fire rings, picnic tables, and food storage. The campground also offers flush toilets, drinking water, showers, and a dish washing sink. Sea Camp Campground consists of 16 individual campsites, but only 12 sites are available for visitors to reserve at any one time; 4 sites are rotated into administrative closures to allow for individual sites to recover from heavy use and 3 sites are designated for overflow situations (when a visitor without a permit needs to camp for the night). Parties of up to 6 campers reserve individual sites through Recreation.gov. Two group sites that can accommodate up to 20 campers are also available in Sea Camp Campground. Under current management, up to 112 people may camp in the frontcountry campground at one time, with 40 campers allowed in the group sites and 72 campers allowed in the individual sites ([12 available sites x 6 people] + [2 group sites x 20 visitors] = 112 campers).
South End Beach and Waters	The National Park Service has jurisdiction over land/beach located above mean high tide. Land, water, and resources located below mean high tide are under the management and jurisdiction of the State of Georgia. Under current management, South End Beach is accessed by land along the beach from the Dungeness Beach Crossing or directly via the St. Marys Inlet by small watercraft. There are no designated visitor use areas and no active visitor use management along the NPS-managed portion of the beach.
South End Trail	South End Trail begins at a dune crossing just north of the jetty and traverses west and north across the island to a point at the mouth of Beach Creek. The trail passes through dune meadows, interdune shrubs, marsh, maritime forest, and shoreline. It is not a loop trail.

Area / Management Topic	Description of Current Management
Plum Orchard	Plum Orchard Mansion is open for daily NPS-guided tours. Visitors may access Plum Orchard grounds via bicycling or hiking on public roads, as part of the road-based Lands and Legacies commercial tour that departs from Sea Camp, or by private boat.
Nightingale Beach	Visitors may access Nightingale Beach via Dungeness or Sea Camp crossings. There is no direct access from the existing Nightingale Trail. Under current management, there are no visitor facilities available at Nightingale.
Dungeness	The Dungeness Trail follows the road network that leads from the Dungeness Dock southeast to connect the dock, Dungeness Mansion Ruins, Tabby House, and boardwalks/dune crossings to Dungeness Beach.
Bicycle Use and Management	Use of manual and Class 1, 2, and 3 electric bicycles (e-bikes) is allowed on all public roads, including the road connecting Sea Camp dock and Sea Camp Campground, and parking areas within the park's jurisdiction per 36 CFR 4.30. The possession and use of bicycles in designated wilderness is prohibited per 36 CFR 4.30(h)(2). Under a Superintendent's Compendium, beach riding (manual and e-bikes) is also allowed between Sea Camp and Dungeness. Bike use is prohibited on park trails and boardwalks, including the boardwalk from Sea Camp Campground to the beach. Please see the Superintendent's Compendium for the speed limit for bicycles. Visitors interested in biking on the island can either transport their personal bicycle to the island via the passenger ferry or rent one of the 24 bicycles available through the on-island rental operation. The current ferry concessions contract requires the concessioner to provide space for the transport of at least 10 personal bikes to the island on each ferry. The current ferry operator offers space for a maximum of 15 personal bikes per ferry. Reservations for personal bike transport on the ferry is managed via Recreation.gov.
Visitor Services provided by Concessionaire or Commercial Use Authorization	The park currently offers a variety of visitor services through commercial agreements. Passenger ferry service from St. Marys, bicycle and cart rentals, and the road-based Land and Legacies tour are operated under a concession contract. The concessioner also offers limited food and drink options aboard the ferry. CUA holders take customers on guided kayaking, hiking, and camping trips.
Education / Interpretation and Signage	The park posts signs to educate and warn visitors about protected species and/or critical periods for those species, and divert them from sensitive areas as necessary. This would include manatee protection, sea turtle nesting, and shorebird nesting. The park also provides numerous educational formats related to the island's natural and cultural resources, such as interpretive exhibits and displays, interpretive programs, posters, brochures, media releases, visual media, and social media.

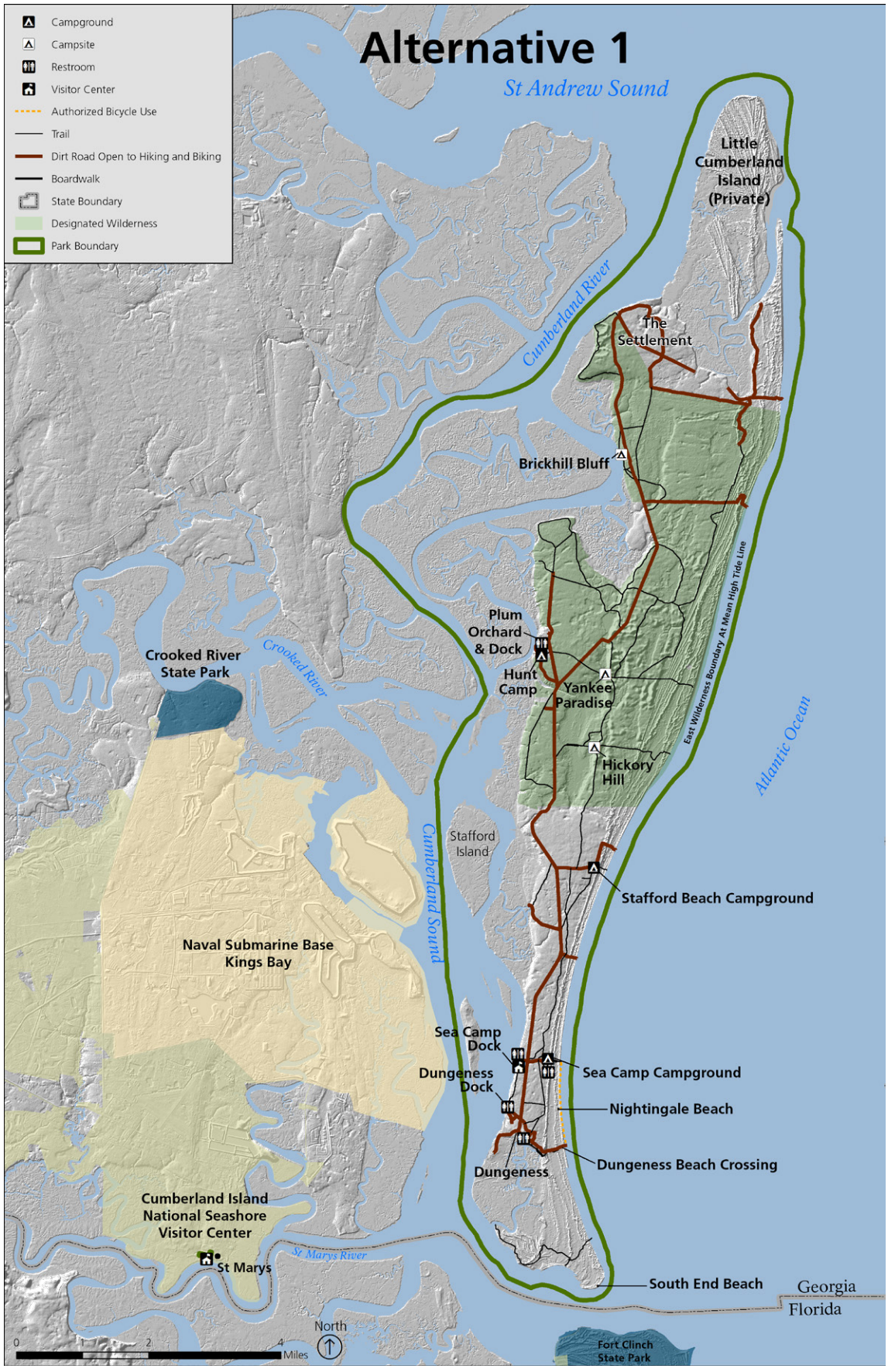


Figure 6. Map of Alternative 1 (No-Action Alternative)

ALTERNATIVE 2: NPS PROPOSED ACTION AND PREFERRED ALTERNATIVE

The proposed action alternative aims to balance visitor use opportunities and resource protection in the areas of Cumberland Island under NPS jurisdiction. Actions proposed under this alternative include improved connections for visitors to the park's fundamental resources and values, increased and more predictable visitor access, and enhanced visitor recreational opportunities in designated wilderness as well as the park's backcountry and frontcountry areas. The proposed action alternative incorporates visitor use management strategies including rotating campsites through administrative closures to allow for recovery and managing within visitor capacities at key locations. A map of alternative 2 follows table 9 (figure 7).

Alternative 2 Summary

Camping Opportunities. Two new wilderness campsites at Toonahowie and Sweetwater Lakes would be designated and added to the Recreation.gov reservation system alongside the existing designated wilderness sites at Brickhill Bluff and Hickory Hill. Fees for the new sites would mirror those charged for existing wilderness campsites. The existing Yankee Paradise site would be abandoned. These changes would allow the same maximum number of people to camp in designated wilderness at one time (72 campers) but spread out the maximum of 12 parties across 4 sites instead of 3.

Backcountry camping capacity would increase from a current maximum of 36 campers to a maximum of 72 campers at one time. Stafford Beach Campground would continue under current management. The 3 sites at Hunt Camp campground now used exclusively for managed hunts and NPS administrative needs would be opened to public reservations. A maximum of 18 campers (3 parties of 6 campers) would be able to make reservations for the Hunt Camp campsites. A new campground with 3 sites would be designated at Beach Creek, accommodating a maximum of 18 additional campers (3 parties of 6 campers).

For frontcountry camping, Sea Camp campground would convert the 3 sites currently reserved for overflow situations into public sites available through Recreation.gov; while no new sites would be developed at the campground, this proposed action would increase camper capacity from 112 campers to up to 130 campers at one time.

Hiking Opportunities. Alternative 2 proposes expanding the trail network on the island to improve connectivity. The South End Trail would be realigned and lengthened to connect the two sections of existing trail. In addition, a new trail segment would be constructed to provide direct beach access at Nightingale.

Visitor Facilities. A bathhouse offering visitor restrooms and outdoor showers would be constructed near Nightingale Beach. Two shade pavilions would be created-- one near the existing Dungeness Beach Boardwalk and one alongside the new Nightingale Trail beach access spur. The proposed pavilions at Nightingale and Dungeness Beaches would be simple, floorless (no concrete pad) shade structures utilizing natural materials with minimal environmental consequences if they were washed out in a storm surge. Proposed visitor facilities would be fully ABAAS compliant for accessibility.

Visitor Service Opportunities. Alternative 2 would expand the types of on-island visitor services that could be offered through concessionaires or commercial use authorization. Expanded ferry service to Sea Camp and/or Plum Orchard dock, on-island kayak and/or canoe rentals, additional flexibility in motorized tour schedules and itineraries, and the potential to sell health, safety, camping

essentials, and bookstore- appropriate items could all be considered alongside the existing on-island bicycle and cart rentals.

Bicycle Management. Bicycle use would be extended north to provide access to Sea Camp and Stafford Beach Crossings. The park would actively manage the number of personal bicycles transported via ferry and the number of bicycles available for on-island rentals. The total daily combined number of bicycles delivered and available for rental would not exceed 100.

Resource Protection. A visitor access and boat landing/anchoring area would be designated at South Beach and a no-wake zone would be designated near the new Beach Creek campsites. Signage would be posted to inform visitors of the Beech Creek no-wake zone, South Beach access and landing area, and prohibition of dogs on South Beach.

Table 9. Alternative 2 (NPS Preferred Alternative)

Area/ Management Topic	Description of Proposed Action
Designated Wilderness Camping	The park would offer camping opportunities at four designated wilderness campsites and maintain the number of visitors that could camp in the designated wilderness at one time. Brickhill Bluff and Hickory Hill would remain active. Additional wilderness campsites would be designated at Toonahowie and Sweetwater Lakes. Sites at Hickory Hill and Sweetwater Lakes would be accessed by foot while the Brickhill Bluff and Toonahowie sites could be accessed via land or nonmotorized and/or small motorized watercraft. The existing site at Yankee Paradise would be abandoned and replaced by public camping opportunities at Hunt Camp campground, which is adjacent to but outside the wilderness area. Similar to the no-action alternative, wilderness campsites would consist of small, cleared spaces and wells, but no other infrastructure or development. The existing well at Toonahowie would be modified for use by campers; at the Sweetwater Lakes campsite, campers could obtain water from the lake. The campsites in designated wilderness would continue to be administered through a permit system managed by Recreation.gov. Fees would be implemented for public campsite reservations at a similar cost to existing wilderness campsites. The National Park Service would follow rules, policy, and engage the public when establishing fee amounts. Permits for each of the 4 wilderness sites would be available for up to 3 parties of 6 people or less at one time. A maximum of 72 visitors would be able to camp in the designated wilderness at one time (4 sites x 3 parties x 6 people = 72 campers).
Backcountry Camping	The park would offer backcountry camping opportunities at current levels at Stafford Beach Campground and new opportunities at Beach Creek campsite and Hunt Camp campground. The designated backcountry sites would continue to be administered through a permit system managed by Recreation.gov; fees would be implemented for public camping reservations. Fees for Beach Creek campsite and Hunt Camp campground would mirror those charged for wilderness campsites and Sea Camp Campground, respectively as amenities are similar. The National Park Service would follow rules, policy, and engage the public when establishing fee amounts. Stafford Beach Campground would continue to accept reservations for 6 of the 10 existing sites at any one time to allow individual sites to recover from visitor use. Up to 36 people would be allowed to camp at Stafford Beach Campground at one time (6 available sites x 6 people = 36 campers). Similar to wilderness campsites, the backcountry campsite at Beach Creek would consist of small, cleared spaces and a well, but no other infrastructure or development. The sites would be accessible by nonmotorized and/or small motorized watercraft or by trail (see South End

Area/ Management Topic	Description of Proposed Action
	Trail description below for additional details). Three parties of up to 6 people each would be permitted to camp at Beach Creek campsite at one time. When Hunt Camp campground, which is adjacent but not in the Cumberland Island Wilderness Area, is not being utilized for park administration use (hunts, trail crews, other permitted uses). It would be available to the public through individual site reservations. No new infrastructure would be needed at Hunt Camp. Reservations would be available for 3 parties of up to 6 people on any given night for a total of 18 campers. Under the NPS preferred alternative, a maximum of 72 reservable camping permits could be issued in the backcountry on any given night (36 Stafford Beach campers + 18 Beach Creek campers + 18 Hunt Camp campers).
Sea Camp Campground (frontcountry camping) and Sea Camp Dock	The park would expand camping opportunities at Sea Camp Campground by adding the 3 existing overflow sites to the current reservation system. Fifteen of the 19 individual sites would be available for visitors to reserve at any one time and 4 sites would be rotated into administrative closures to allow recovery or prevent impacts from heavy use. Parties of up to 6 campers would be able to reserve sites through Recreation.gov and fees would continue to be implemented for public campsite reservations. The two group sites that can accommodate up to 20 campers would remain open for reservations as well. Under the NPS preferred alternative, up to 130 people may camp in the frontcountry campground at one time, with 40 campers allowed in the group sites and 90 campers allowed in the individual sites ([15 available sites x 6 people] + [2 group sites x 20 visitors] = 130 campers). Kayak and/or canoe rentals could be available at Sea Camp Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources.
South End Beach and Waters	The park would designate an approximately 1,900-foot-wide visitor access and boat landing and anchoring area along South End Beach that could shift from year to year depending on coastline conditions. No anchoring or beaching of boats would be permitted outside of the designated area. Establishment of this area would designate an area accessible to visitors and guide visitor use away from sensitive natural resources. The designated landing and anchoring area would be delineated by buoys, markers, signage, and/or flagging. Signage that provides information regarding sensitive species, directs visitors to pay park entrance fees, and notifies commercial service providers of the requirement to have a commercial use authorization would be installed. Overnight anchoring at South End Beach would not be allowed. Dogs would NOT be permitted on South End Beach. Pedestrian access to South End Beach would continue via Dungeness Beach Crossing. Beach Creek would be designated as a no-wake zone as would the small, unnamed tidal creeks that occupy the marsh area just north of South End Beach.
South End Trail	The park would construct and realign South End Trail to provide a loop trail opportunity by connecting the Dungeness Marsh Boardwalk to portions of the existing trail. That new segment would serve as one leg of the loop and the beach would serve as the other leg. A new spur trail would be constructed to connect with the proposed Beach Creek campsite. A portion of the existing South End Trail that runs through the south end marsh would be abandoned and the segment realigned onto upland terrain.

Area/ Management Topic	Description of Proposed Action
Plum Orchard	The park would continue to offer daily NPS-guided tours of the Plum Orchard Mansion. Visitors would continue to be able to access Plum Orchard grounds via bicycling along park roads, hiking, personal boat, or as part of the Lands and Legacies commercial tour. Additional ferry service to Plum Orchard dock would be considered as a new, separate ferry route or as an additional stop on the existing route/schedule. Visitors debarking from the Plum Orchard ferry stop would have direct access to the Plum Orchard grounds and could opt to take one of the NPS-guided tours of the mansion or decide to use the ferry stop as an arrival /departure point for wilderness and backcountry hiking or camping experiences. A new shorter motorized concessions tour from Sea Camp to Plum Orchard would allow day-use visitors more flexibility to also visit other key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. This tour would be considered and evaluated during the concessioner prospectus. Kayak and/or canoe rentals could be available at Plum Orchard Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.
Nightingale Beach and Trail	The park would create one new trail segment to provide direct beach access from the Nightingale Trail. A bathhouse consisting of restrooms and outdoor showers (~400 square feet) would be constructed at the junction of the existing Nightingale Trail and the new segment. Approximately 2,670 feet of water utility line would be installed from an existing well house, across the Main Road, and along the Nightingale Trail. Electricity would either be provided by solar panels or by extending an existing utility line approximately 1,850 feet along the Nightingale Trail from the Main Road. These utility lines would be installed utilizing a trenching machine along existing roads and trails. An approximately 1,200 square foot septic leach field would be installed in appropriate proximity to the bathhouse. The exact location of these facilities would be determined during design. Additional compliance requirements would occur before implementation. A pavilion (~800 square feet) would also be constructed alongside the Nightingale Beach access spur, providing shelter to visitors within the dune field. Additional compliance requirements would occur before implementation.
Dungeness	A pavilion (~800 square feet) would be constructed near the Dungeness Beach boardwalk, providing shelter to visitors within the dune field. Kayak and/or canoe rentals could be available at Dungeness Dock or Beach Creek Dock if either location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the docks would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.
Bicycle Use and Management	Management of bicycles and Class 1, 2, and 3 electric bicycles (e-bikes) would be the same as described in Alternative 1. However, beach riding (manual and e-bikes) would be extended to be allowed between Dungeness and Stafford Beach Crossing. Bike use would remain prohibited on park trails and boardwalks, including the boardwalk from Sea Camp Campground to the beach. Please see the superintendent's compendium for the speed limit for bicycles. Bicycle use would continue to be allowed on the beach from August 1 through March 1; however, from April 1 through July 31, bicycle and e-bike use would remain prohibited from

Area/ Management Topic	Description of Proposed Action
	30 minutes before sunset to 30 minutes after sunrise during turtle nesting season (April 1 and October 30). For bicycle and e-bike speed limits, please see the superintendent's compendium. Additionally, the park would actively manage the maximum number of personal bikes transported on the ferry and rented through the on-island concession. No more than 15 bicycles would be delivered per vessel and no more than 25 bicycles would be available for rent through the on-island concession. The total daily combined number of bicycles delivered and available for rent would not exceed 100.
Visitor Services provided by Concessioner or Commercial Use Authorization	The park would expand the types of visitor services offered through commercial agreements. On-island bike and cart rentals would continue. An on-island kayak and/or canoe rental service, with the possibility of guided rental options, would be considered at Plum Orchard, Sea Camp, or Dungeness. Existing or temporary infrastructure would be utilized, and considerations would be taken to protect sensitive natural and/or cultural resources. Passenger ferry service from St. Marys, Georgia, could be expanded to include mid-afternoon ferry trips, earlier departures from the mainland, and/or a sunset return option. An additional Plum Orchard ferry stop would also be considered. The park would expand motorized concession tours to offer a Sea Camp to Plum Orchard tour that would allow day users more flexibility to visit key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. Visitors could have the opportunity to purchase health, safety, and essential camping items, as well as bookstore-appropriate merchandise (souvenirs, books, etc.), on the island.
Education / Interpretation and Signage	Increased visitor education would be provided (e.g., interpretation, signage, literature) regarding sensitive species and how visitors can help protect island resources. Installation of signs would occur outside the wilderness area wherever possible. Additional signage regarding the no-wake zones and no dogs on South End Beach would be posted in appropriate locations. Outreach to local underserved populations would be expanded and opportunities to provide more affordable access to the island for these groups would be explored. This could include expanded outreach to local school and youth groups and/or a partnership with the ferry concession operator or local philanthropic groups to provide assistance to individuals and families unable to afford the normal ferry fare.

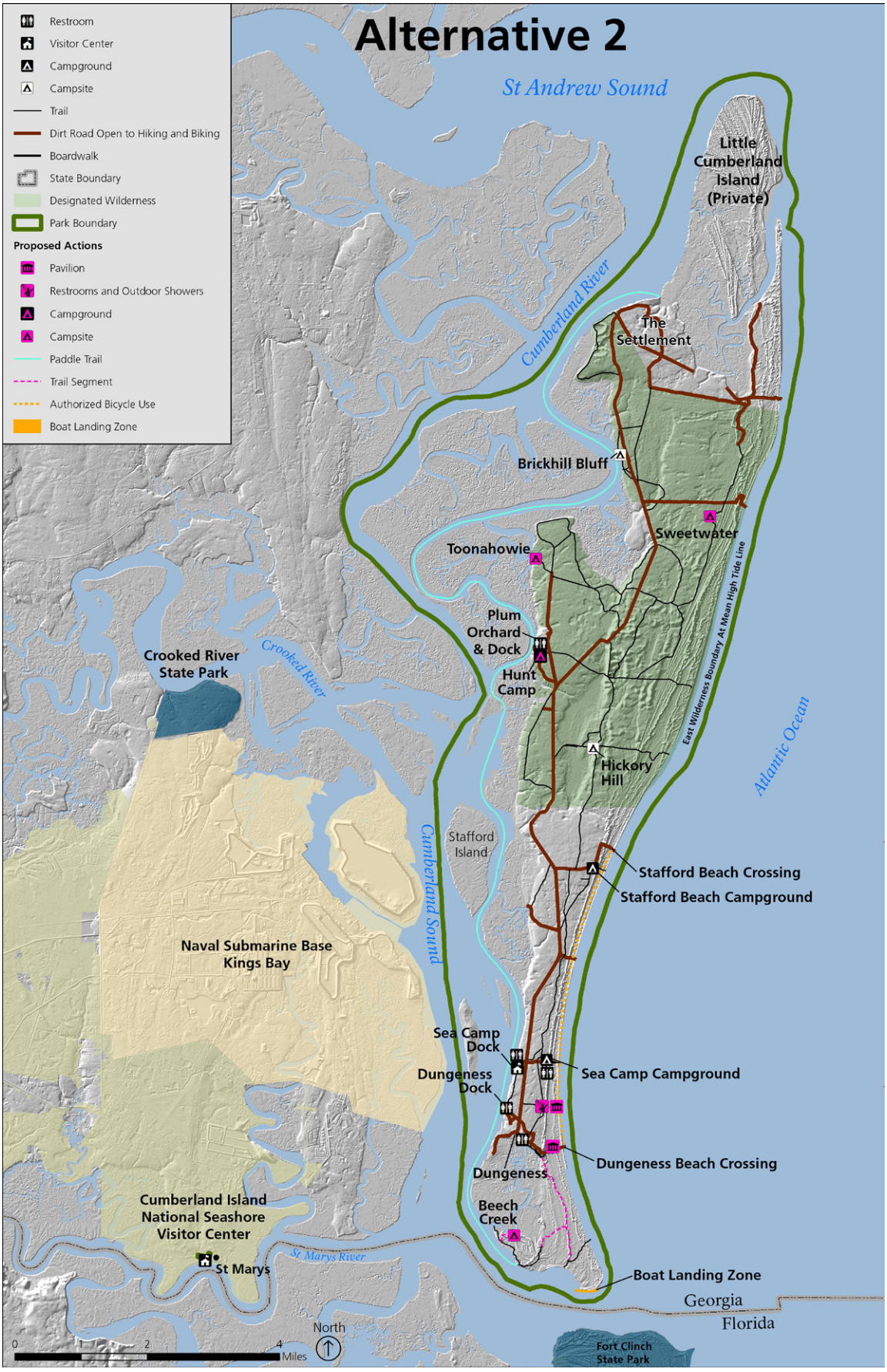


Figure 7. Map of Alternative 2 (NPS Preferred Alternative)

MITIGATION MEASURES

Mitigation measures are presented as part of the proposed action alternative. These actions have been developed to lessen the potential adverse effects of the NPS preferred alternative.

Natural Resources

To minimize potential impact on the natural resources of Cumberland Island from the preferred alternative, actions included in this plan should be implemented with the following conditions:

- Educate ferry operators and boaters about manatees, sea turtles, and sturgeon and boater responsibility.
- Enforce regulations related to the protection of manatees and sea turtles.
- Manage visitor activity adjacent to the Plum Orchard Mansion pond to prevent disturbance of wood storks and other wading birds. Ideally, the number of visitors directly adjacent to the pond should be controlled. If necessary, fencing could be designed to complement and blend with the historic cultural landscape. If fencing is not feasible, then a screen/barrier using natural vegetation should be developed to prevent access to the pond.
- Develop an educational program for concession staff and park interpretive staff that focuses on threatened and endangered (T&E) species identification and proper actions when species are encountered. Provide refresher training for staff on a regular basis and ensure that new personnel receive training promptly.
- NPS staff would monitor the beach for nesting American oystercatcher pairs, least tern colonies, and other species of concern. Informational signs would be used to identify nesting areas and restrict access when and where necessary to protect the species of concern.
- Staff involved with the annual sea turtle nest monitoring and protection project would continue to maintain records of disturbances to nest sites. A database would be developed to evaluate trends in human disturbance potentially related to implementation of the preferred alternative. Mitigation in the form of increased visitor education efforts and nest protection measures would be necessary to maintain a reduced pedestrian presence/disturbance around nest sites.
- Seasonal trail or beach closures may be implemented during certain times of the year. The park's resource managers would make this determination based on the presence of species of concern, their proximity to key visitor access routes or locations, and the likelihood that increased levels of human disturbance may negatively impact breeding or nesting success.
- Any potential future night programming would take precautions to minimize the use of lighting and noise disturbances.
- Bicycle and e-bike use on the beach would be prohibited between 30 minutes before sunset to 30 minutes after sunrise during sea turtle nesting season between April 1 and October 30.
- While on the beach, the speed limit for bicycles and e-bikes would be reduced to 20 miles per hour from April 1 through July 31.
- According to NPS *Management Policies 2006*, the National Park Service would strive to construct the proposed trails with a sustainable design to minimize potential environmental impacts. Development would not compete with, dominate park features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity. To the

extent possible, the design and management of the proposed trails and boardwalks would emphasize environmentally sensitive construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings.

- Care would be taken to not disturb any sensitive wildlife species found nesting, hibernating, estivating, or otherwise living in or immediately nearby work sites. Resource management personnel would be notified/consulted when wildlife must be disturbed or handled.
- If sensitive resources are discovered during trail or campsite construction, construction would cease and the area would be surveyed in more detail so that impacts could be avoided or minimized and/or an alternative route established.
- Educate motorized tour operators of the potential for tortoises on the road and what to do if one is encountered.

Cultural Resources

To minimize potential impact on the cultural resources of Cumberland Island from the preferred alternative, actions included in this plan should be implemented with the following conditions:

- The park would conduct an archeological survey of any area that would be subject to ground disturbance and would avoid and minimize the effects of new development on significance archeological resources.
- The park would consider the effect of all new development on historic properties in consultation with the Georgia state historic preservation office (SHPO) and other consulting parties in accordance with section 106 of the National Historic Preservation Act (36 CFR 800).
- Prior to the start of construction projects that involve ground disturbance, the National Park Service would consult with American Indian tribes to determine if on-site tribal cultural monitoring is necessary.
- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery, and the park would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001) would be followed.

Wilderness Resources and Character

To minimize potential impact on wilderness character of Cumberland Island from the preferred alternative, actions included in this plan should be implemented with the following conditions:

- Develop an educational program for concession staff and park interpretive staff that explains what congressionally designated wilderness is, provides an understanding of the type of experience sought by typical wilderness users, and describes methods for minimizing impacts on wilderness character. Provide refresher training for staff on a regular basis and ensure that new personnel receive training promptly.

ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION

According to NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*, reasons to eliminate actions include:

- Technical or economic infeasibility.
- Inability to meet project objectives or resolve need, to a large degree.
- Duplication with other, less environmentally damaging or less expensive alternatives.
- Conflict with up-to-date and valid park plan, statement, purpose, and significance, or other policy such that a major change in the plan or policy would be needed to implement the alternative.
- Too great an environmental impact.
- The alternative addresses issues beyond the scope of the NEPA review.

The following actions and concepts were considered but dismissed from detailed evaluation:

- Prohibit bicycle and e-bike access north of Plum Orchard. This action runs counter to NPS management policies that allow bicycle use along any public roads open to vehicles.
- Implement permit system for bicycle and e-bike use on public roads north of Plum Orchard. Requiring visitors to obtain permits to bike on public roads open to vehicle use may be confusing and overly restrictive. NPS management policies allow bicycle use along any public roads open to vehicles.
- Eliminate Yankee Paradise and Hickory Hill wilderness campsites and create a new designated campsite at the existing well located between the eliminated sites. While this action would utilize an existing well within designated wilderness, it would result in additional resource impacts from the creation of a new replacement site.
- Full closure of South End Beach. South End Beach provides the only safe and reliable motorized boat landing area because of tidal fluctuations. A full area closure would deny this type of visitor access.

CHAPTER 4: AFFECTED ENVIRONMENT AND IMPACT ANALYSIS

The National Environmental Policy Act requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental impacts that cannot be avoided if an action is implemented. This chapter begins with an explanation of methods, describes the existing conditions including existing resources trends and planned activities (affected environment), and analyzes the potential environmental consequences (impacts or effects) that would occur as a result of implementing the alternatives. This chapter assesses the potential impacts on vegetation, wetlands, special status species, character of designated and potential wilderness, visitor use and quality of experience, and socioeconomics.

VEGETATION

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

Cumberland Island National Seashore is one of the Atlantic Coast's most ecologically diverse barrier islands. Local variations in environmental conditions create extensive and unique communities across the island—from the beach and dune system on the east, through the interdune, freshwater wetland, and upland forest habitats in the interior, to the salt marsh on the west. Vegetation within seashore boundaries is closely related to soil type, past land use, and fire history.

Island vegetation includes marshlands, live oak forests, pine stands, palmetto, swamps, and coastal scrub-shrub species. Understory vegetation consists of the underlying vegetation beneath a forest canopy. In the context of this document, many of the vegetation types described below can be classified as understory, with the exception of mature trees. The southern end of the island includes an extensive example of an intact salt panne community type, which is dominated by halophytic, succulent dwarf-shrubs. Much of the upland portion of Cumberland Island consists of live oak (*Quercus virginiana*) / palmetto (*Sabal palmetto*) maritime forests. Other terrestrial communities include extensive dune systems, interdunal wetlands, freshwater ponds and wetlands, mixed-pine / hardwood forests, and pine-dominated (*Pinus* sp.) flatwoods (Byrne et al. 2012). Within the tidal area on the west side of the island, extensive salt marshes meander along the creeks and create pockets of stabilizing grasses dominated by salt-marsh cordgrass (*Spartina alterniflora*). The tidal amplitude in Georgia is large, approximately 7 feet, so these "bar-built" estuaries are energy absorbing systems (NPS wilderness MP 2000).

Vegetation is critical in maintaining the stability of the island. Extensive root systems of maritime grasses and herbaceous plants help to stabilize sediments, whether windblown or waterborne. In this way, sand dunes and salt marshes build, elevating the topography just enough to create a different microclimate for other plant life to take root. Dune plant communities comprise more than 10% of the island and include sparse stands of grasses, forbs, and sedges along the primary dunes, interdune meadow, and secondary dunes along the 17.5-mile-long beach. Sea oats (*Uniola paniculata*), railroad vine (*Ipomoea pes-caprae*), beach morning glory (*Ipomoea stolonifera*), and beach pennywort (*Hydrocotyle bonariensis*) are important stabilizing plants (NPS Wilderness MP 2000). Where soil has not been disturbed by agricultural tilling, understory species including piney woods dropseed (*Sporobolus junceus*), Aristida spp., Wavy-leaf Noseburn (*Tragia urens*), *Asclepias longifolia*, and Stipa spp. are scattered (NPS Fire Management Plan 2015).

In 2017, the Southeast Coast Network, with the support of the National Park Service Vegetation Mapping Inventory Program, described and mapped vegetation at the national seashore (see

figure 8). For a detailed description of the vegetation types identified in areas of the proposed actions, please refer to appendix J. The following vegetation types were mapped in areas of the national seashore included in this management plan:

- Live Oak – (Cabbage Palmetto) Forest Alliance / Southeastern Florida Maritime Hammock
- Sea Oats Temperate Herbaceous Alliance
- Southern Atlantic Coastal Plain Carolina Willow Dune Swale
- Red-cedar – Live Oak – Cabbage Palmetto Marsh Hammock
- Seaside-Tansy Tidal Shrub Flat

The unvegetated surface is predominantly composed of bare sand, some leaf litter, scatterings of fallen wood, and standing water. In these areas of the island, there is very little evidence of disturbance other than horse trails. Some Jesuit's bark (*Iva frutescens*) and cabbage palmetto (*Sabal palmetto*) may be scattered within this vegetation type and the community also supports the state-vulnerable gulf coast swallow-wort (*Cynanchum angustifolium*).

A long history of fire suppression on the island has resulted in woody encroachment and drying of freshwater wetlands, as well as a reduction in the diversity and composition of the vegetative understory in the fire-adapted uplands. Recent and ongoing fire management activities, including prescribed burns, have gradually improved species diversity and composition for native fire-adapted species.

Estuarine vegetation and dune vegetation have been affected by accretion and erosion processes impacted by climate change, in addition to increased storm frequency. The boundary of estuarine vegetation and marshlands is expected to move inland along the western side of the island as sea level rises and areas that are now upland become marshland.

Invasive plant species are an ongoing threat to understory vegetation on the island because they outcompete native vegetation and reduce species diversity. The spread of invasive species is increased through seed dispersal on shoes, bike tires, and other personal gear. Ongoing and future management actions to control the spread of invasive species on the island help to minimize the spread of invasive plant species and their impacts.

Ongoing and future visitor use and maintenance of designated campsites results in vegetation trampling and removal and introduction of invasive species. Understory vegetation is impacted by visitor trampling and soil compaction from the creation of social trails and encroachment around designated campsites. Trampling and soil compaction are most noticeable in higher-density recreational use areas on the island. Cumberland Island hosts an actively controlled feral hog population and a currently uncontrolled feral horse population. Rooting from hogs impedes seedling recruitment, damages groundcover, disturbs soil structure, and serves as a vector for nonnative plant species. Ongoing and future management of the hog population minimizes but does not eliminate this destruction. The horses and hogs impact understory vegetation by trampling and consuming native vegetation in areas throughout the park. The feral horse herd likely consumes between 200 to 400 tons of vegetation each year and removes up to 98% of vegetation in areas they frequent (NPS 2018). These horses graze intensely on salt marsh grasses, exacerbating erosion and degrading water quality and habitat for wildlife. They also destabilize sand dunes, trample shorebird nests, and adversely affect water quality and wetlands habitat (NPS 2016a). In addition to wildlife, understory vegetation on the island is also trampled by visitors in higher-density recreational use areas from the creation of social trails and encroachment around designated campsites.

Vegetation and Developed Land Classes in Cumberland Island National Seashore

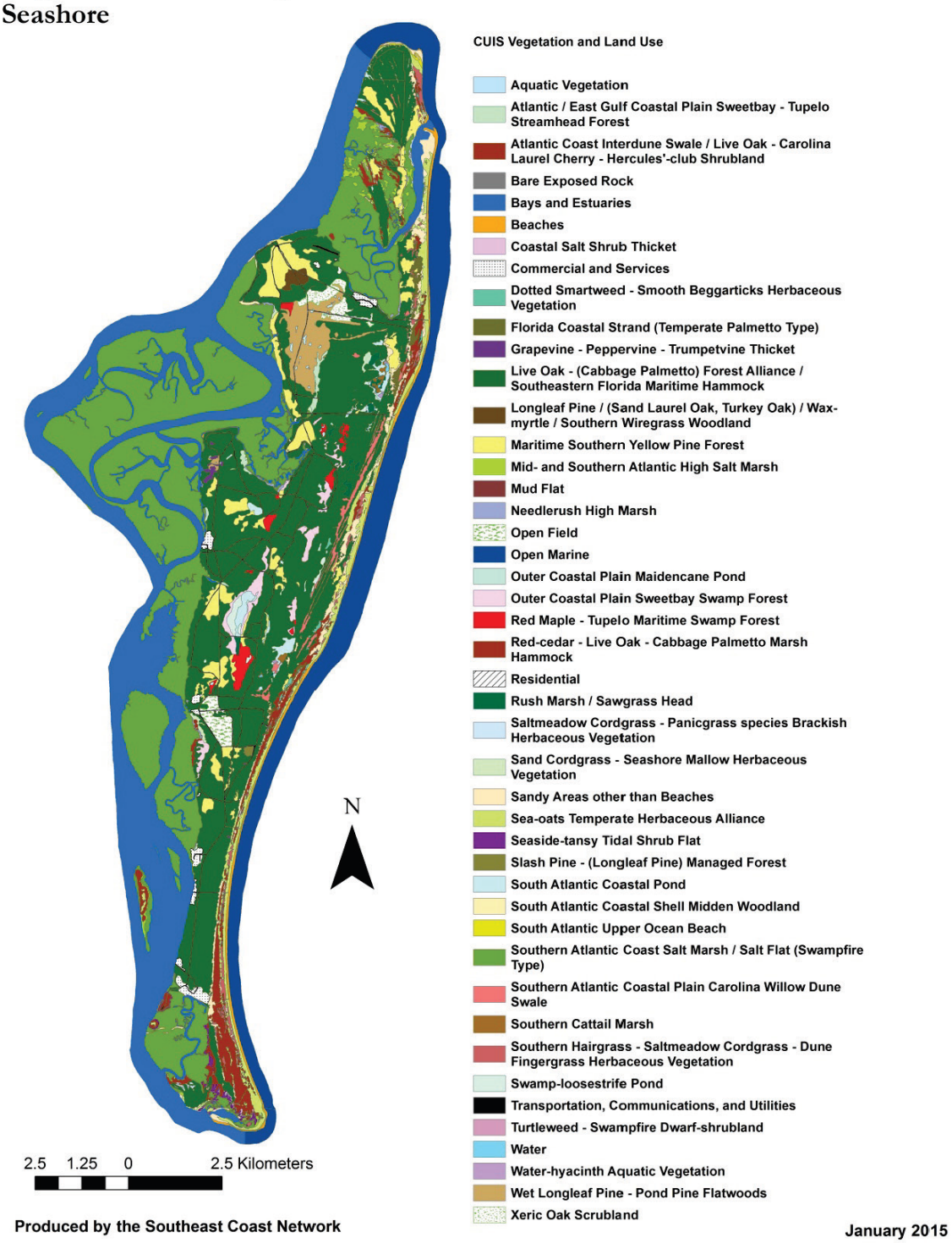


Figure 8. Map of Cumberland Island Vegetation

Impacts on Vegetation

Alternative 1, No-Action Alternative. Under the no-action alternative, the condition of vegetation would remain the same as described in the affected environment. The current resource threats and impacts on vegetation would continue to occur (i.e., invasive species, social trails, hogs, etc.). Ongoing visitor-created social trail expansion is anticipated in the dune areas between Sea Camp and Stafford Beach Campgrounds and the beach.

Alternative 2, NPS Preferred Alternative. Construction of new trails and facilities would require clearing understory vegetation and ground disturbance in some areas. The removal of mature trees would be avoided to the greatest extent practicable. Before any construction occurs, a soil investigation would be conducted to identify any soil conditions indicative of wetlands and all attempts would be made to avoid or minimize impacts on wetland vegetation. If no alternative sites for trail placement were located, boardwalks elevated with helical piers would be used to maintain hydrologic functions and to minimize the need for fill and ground disturbing activities to wetland vegetation in these site-specific areas. Following the completion of these elements, disturbed areas would be allowed to recover naturally or revegetated with native plant species.

Estimated areas of impact on vegetation are presented below. The estimates are approximate because the trail alignments and facility sitings are not yet in the design stage of development and could change; however, the analysis considers a worst-case scenario approach and impacts are not anticipated to exceed the acreage of impacts presented below.

Toonahowie and Sweetwater Lakes Wilderness Campsite—

The proposed campsites are within the Live Oak – (Cabbage Palmetto) Forest Alliance vegetation type. The locations of these campsites were chosen in part because they are in upland areas with little groundcover and understory vegetation and therefore designating the campsite would result in little to no change from the current condition. Vegetation removal within the campsites (less than 1,000 square feet for each site) would be minimal with little impact on understory vegetation, and no impact on mature trees.

Yankee Paradise Wilderness Campsite—

While understory vegetation is naturally sparse and visitor use is minimal, the abandonment of Yankee Paradise Wilderness Campsite would eliminate trampling of vegetation in the localized area around the existing campsite (less than 1,000 square feet) and allow natural reestablishment, resulting in a slight, but beneficial impact.

Beach Creek Backcountry Campsite—

The proposed backcountry campsite is within the Red-cedar—Live Oak—Cabbage Palmetto Marsh Hammock vegetation type. The location of this campsite was chosen because it is in an area with little groundcover and understory vegetation. While marsh detritus from previous hurricane-induced high tide events may need to be cleared, live vegetation removal in the campsite (less than 1,000 square feet) would be minimal with little impact on understory vegetation, and no impact on mature trees. This campsite is in an upland area with a marsh area buffer to mitigate storm surge.

Nightingale Bathhouse—

Construction of the Nightingale Bathhouse would result in the removal of approximately 1,000 square feet of understory and ground cover in Live Oak habitat. Additional understory and ground cover would be removed for the associated infrastructure, including approximately 2,670 linear feet between the bathhouse and main road for utility lines and 1,200 square feet for a septic leach field.

Vegetation would not recover on approximately 400 square feet of the area since the bathhouse is a long-term facility. However, vegetation cleared for construction of the bathhouse, leach field, and utilities would be re-seeded with native vegetation and should recover quickly. Efforts would be made to minimize the removal of mature trees for installation of the leach field, limiting the impacts on vegetation that take longer to recover. Maintenance of the utilities may require periodic clearing and removal of vegetation, but these areas would be re-seeded and impacts would be short term.

Nightingale and Dungeness Pavilions—

Each approximately 800-square-foot pavilion would be placed in areas mapped as Southern Atlantic Coastal Plain Carolina Willow Dune Swale and/or Sea-oats Temperate Herbaceous Alliance. This habitat has very little groundcover in the selected locations and the pavilions would be placed to avoid the need to remove larger mature vegetation. In addition, the pavilions would be sited in appropriate locations to avoid the need for extensive grading efforts and an anticipated floorless design would allow dune sands to migrate without damaging the structure. The island has been in a state of accretion in this area and there is an area of vegetation and sand dunes between the proposed pavilions and the shoreline that would buffer storm surge.

Nightingale Area Beach Access Trail—

The new beach access route would cross through up to approximately 425 linear feet of freshwater forested/shrub wetland in the Red-cedar—Live Oak—Cabbage Palmetto Marsh Hammock vegetation. Helical piers would be installed to support a lofted boardwalk approximately 24 inches above the ground through confirmed wetland areas. The piers would affect up to 165 square feet (0.004 acre) of soil. The total surface of the boardwalk would not exceed approximately 0.03 acre and light and rainfall would be able to infiltrate through and under the elevated boardwalk. The remaining length of trail would predominantly cross through Live Oak – (Cabbage Palmetto) Forest Alliance / Southeastern Florida Maritime Hammock vegetation type. While some understory vegetation would be removed to construct the trail, the route would be designed to avoid the removal of mature trees and minimize impacts on understory vegetation.

South End Trail—

The majority of the trail would cross through sandy upland sparsely vegetated areas. The trail route would follow existing game trails and would require minimal removal of understory vegetation. However, the trail would cross through up to approximately 490 linear feet of freshwater forested/shrub wetlands in Red-cedar – Live Oak vegetation and Live Oak – (Cabbage Palmetto) Forest Alliance. Helical piers would be installed to support a lofted boardwalk approximately 24 inches above the ground through confirmed wetland areas. Up to 190 square feet (0.004 acre) of soil and vegetation would be removed for the placement of the support piers. The total surface of the boardwalk would not exceed approximately 0.03 acre and light and rainfall would be able to infiltrate through and under the elevated boardwalk. During design, efforts would be made to minimize impacts on understory vegetation.

South End Spur Trail to Beach Creek Campsite—

The trail would cross through up to approximately 35 linear feet of estuarine and marine wetlands in Red-cedar – Live Oak vegetation. As stated above, helical piers would be installed to support a lofted boardwalk through confirmed wetland areas. The piers would affect up to 16 square feet (0.0003 acre) of soil. The total surface of the boardwalk would not exceed approximately 105 square feet (0.002 acre) acres and light and rainfall would be able to infiltrate through and under the elevated boardwalk. During design, efforts would be made to minimize impacts on understory vegetation.

Overall, adverse impacts would primarily be limited to understory vegetation in locations where new development would occur because vegetation in those areas would be removed completely. Because of the small footprint of development, the design intent to minimize impacts wherever possible, and the extent of most vegetation types across the island, the impacts are anticipated to be slight in nature.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above under the affected environment section. Most of the vegetation in areas where visitor facilities are planned under alternative 2 would not benefit from controlled burns. Under alternative 2, removal of understory vegetation under alternative 2 would contribute to the ongoing adverse cumulative impacts caused by trampling, erosion, grazing, and invasive species. Proposed revegetation of disturbed areas would contribute slightly to the long-term beneficial cumulative impacts from continued management of invasive species and feral hogs.

Conclusion. Under the no-action alternative, there would be no proposed changes to vegetation on the island. Under alternative 2, there are both beneficial and adverse direct impacts on vegetation as described above. Proposed construction of facilities and trails would result in the permanent removal of approximately 2,500 square feet of vegetation. During construction, approximately 3,870 square feet would be cleared of understory vegetation. Mitigation efforts would limit the extent of impacts on vegetation and would include revegetation. Overall, alternative 2 would remove approximately 6,400 square feet of vegetation over the life of the plan, but the proposed actions would likely be staggered, pending funding and most adverse impacts would be short-term (during construction or maintenance activities).

WETLANDS

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

National Wetlands Inventory mapping was completed by the US Fish and Wildlife Service (USFWS) and is available for the entire project area (figure 8)(USFWS 2019c). The inventory provides reconnaissance-level information on the location, type, and size of wetlands based on the analysis of high-altitude imagery. Wetlands are identified based on vegetation, visible hydrology, and geography (USFWS 2022b). Additionally, the recent vegetation mapping natural resource report for the national seashore that includes locations of vegetative cover types typical of wetlands in the project area (figure 8), contributed to a preliminary assessment of wetland locations. A formal wetland delineation would be needed to further define the boundaries and types of wetlands upon further design of the proposed actions.

Wetlands in the project area have been previously affected in spot locations through vegetation disturbance and placement of fill during construction of trails and boardwalks. In general, wetlands in the park provide important resting habitat for migratory waterfowl and ground-nesting birds. Wetlands also support unique plant species.

Two wetland types, described below are depicted in the project area:

- **Freshwater forested/shrub wetland.** These freshwater wetlands are dominated by trees, shrubs, persistent emergents, emergent mosses or lichens. They occur in tidal areas where salinity levels are below 0.5 ppt and are dominated by woody vegetation less than 20 feet (6 meters [m]) tall. Tidal fresh surface water may be present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the

ground surface for most of the season (USFWS 2018). In the vegetation mapping natural resource report (NPS 2017), these areas are commonly mapped as red-cedar – live oak – cabbage palmetto marsh hammock. Plant species that dominate forested/shrub wetland in the national seashore include red cedar (*Juniperus virginiana* var. *silicicola*), cabbage palmetto (*Sabal palmetto*), and saw palmetto (*Serenoa repens*).

- **Estuarine and Marine Wetland.** These wetlands consist of deepwater tidal habitats and adjacent tidal wetlands and shrublands. In the project area, this consists of tidal wetlands that have open, partially obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff by land. These wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. These wetlands are usually dominated by perennial plants. Tidal shrubland is dominated by wax-myrtle (*Morella cerifera*) and Eastern poison-ivy (*Toxicodendron radicans* ssp. *Radicans*). In the vegetation mapping natural resource report (NPS 2017), dominate plant species in these areas also include red cedar (*Juniperus virginiana* var. *silicicola*), cabbage palmetto (*Sabal palmetto*), and saw palmetto (*Serenoa repens*).

A long history of fire suppression on the island has resulted in encroachment of woody vegetation and drying of freshwater wetlands. Recent and ongoing fire management activities on the island, including prescribed burns, have improved wetland conditions by reducing the woody vegetation and allowing the return of wetland areas in the island's upland areas.

Estuarine wetlands have been affected by sea level rise and increased storm surge affiliated with climate change that can alter the salinity of the water and result in periodic inundation of estuarine vegetation.

Invasive plant species are an ongoing threat to wetland vegetation on the island as they outcompete native wetland vegetation and reduce species diversity. Visitor use in and around wetland areas increases the potential spread of invasive species; however, ongoing management to control the spread of invasive species on the island has helped to minimize these impacts.

Cumberland Island hosts an actively controlled feral hog population and a currently uncontrolled feral horse population. Rooting from hogs is very destructive and can seriously impede seedling recruitment, damage groundcover, disturb soil structure, and serve as a vector for nonnative plant species. Management of the hog population has minimized this destruction. Feral horses require large amounts of forage and freshwater. The horses impact wetland areas by trampling and consuming native wetland vegetation. The feral horse herd likely consumes between 200 to 400 tons of vegetation each year and removes up to 98% of vegetation in areas they frequent (NPS 2018). In addition to wildlife, the creation of social trails by visitors increases erosion and reduces wetland functions in several locations, most noticeably in higher-density recreational use areas on the island.

Ongoing motorized boat activity in the Beach Creek area, vessel traffic in the open waterways, and natural storm surges and wave energy all contribute to ongoing shoreline erosion and the erosion of salt marsh wetlands.

Impacts on Wetlands

Alternative 1, No-Action Alternative. Under the no-action alternative, the condition of wetlands would remain the same as described in the affected environment. The current resource threats and impacts on wetlands would continue to occur (i.e., invasive species, social trails, feral hogs, etc.).

Alternative 2, NPS Preferred Alternative. A wetland delineation would be necessary upon further design of the proposed trails. Construction of new trails and facilities would primarily occur

on excessively drained sandy soils. The construction of new trails and facilities would involve additional vegetation clearing and ground disturbance in some areas. Before any construction occurs, a soil investigation and wetland delineation would be conducted to confirm soil-bearing capacity and drainage characteristics. All attempts would be made to avoid or minimize impacts on wetlands. If no-alternative nonwetland sites were located, boardwalks elevated a minimum of 24 inches with helical piers that would allow hydrologic flow and sunlight to would be used to avoid and minimize impacts on wetlands in these site-specific areas. Wetlands would be minimally impacted through the placement of helical piers. Estimated areas of impact are presented below. The estimates are approximate because the trail alignment is not yet in the design stage of development and could change; however, impacts would not exceed these numbers and are anticipated to be considerably less. If necessary, additional compliance would be completed at that time.

- **Nightingale Beach Access Trail.** The new route would cross through up to approximately 425 linear feet of freshwater forested/shrub wetland. Placement of helical piers to support the boardwalk would require digging postholes and would permanently disturb up to 165 square feet (0.004 acre) of soil. The total surface of the boardwalk would not exceed approximately 0.03 acre.
- **South End Trail.** The trail would cross through up to approximately 490 linear feet of freshwater forested/shrub wetlands. The use of helical piers to support the boardwalk would affect up to 190 square feet (0.004 acre) of soil. The total surface area of the boardwalk would not exceed approximately 1,470 square feet (0.03 acre).
- **South End Spur Trail to Beach Creek Campsite.** The trail would cross through up to approximately 35 linear feet of estuarine and marine wetlands. The use of helical piers to support the boardwalk would affect up to 16 square feet (0.0003 acre) of soil. The total surface area of the boardwalk would shade an approximate 105 square foot (0.002 acre) area.

Construction of the boardwalks would result in the loss of wetlands in spot locations where helical piers were placed as a result of vegetation removal. Some larger vegetation (shrubs and trees) would potentially be removed for the placement of the boardwalks through forested wetlands. In addition, some continual adverse impacts on wetland vegetation could result from shading caused by the boardwalks; however, boardwalks would be constructed with at least 24 inches of clearance to minimize shading and there is very little groundcover or wetland vegetation in most of the proposed trail locations. Removal of trees of substantial size would be avoided to the extent possible to avoid impacts on natural resources. Following construction of the boardwalks, disturbed areas would be allowed to recover naturally or revegetated with native plant species. Wetlands in this portion of the island would continue to filter and convey precipitation and provide an important complex of habitats. The installation of the boardwalks would provide visitor access to areas without trampling wetlands and wetland vegetation and would reduce social trails in these areas. Concentrating access routes on elevated boardwalks would result in a long-term benefit to wetlands in these locations.

To comply with Executive Order 11990, "Protection of Wetlands," any facilities or construction would be designed to avoid adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. A wetland delineation would be necessary to confirm anticipated impacts upon further design development of the trails, though impacts on wetlands are not anticipated to be greater than 0.1 acre and therefore excepted from statement of findings and compensation requirements (NPS 2016b). If impacts greater than 0.1 acre were unavoidable, additional compliance and a wetlands statement of findings would be necessary prior to trail development.

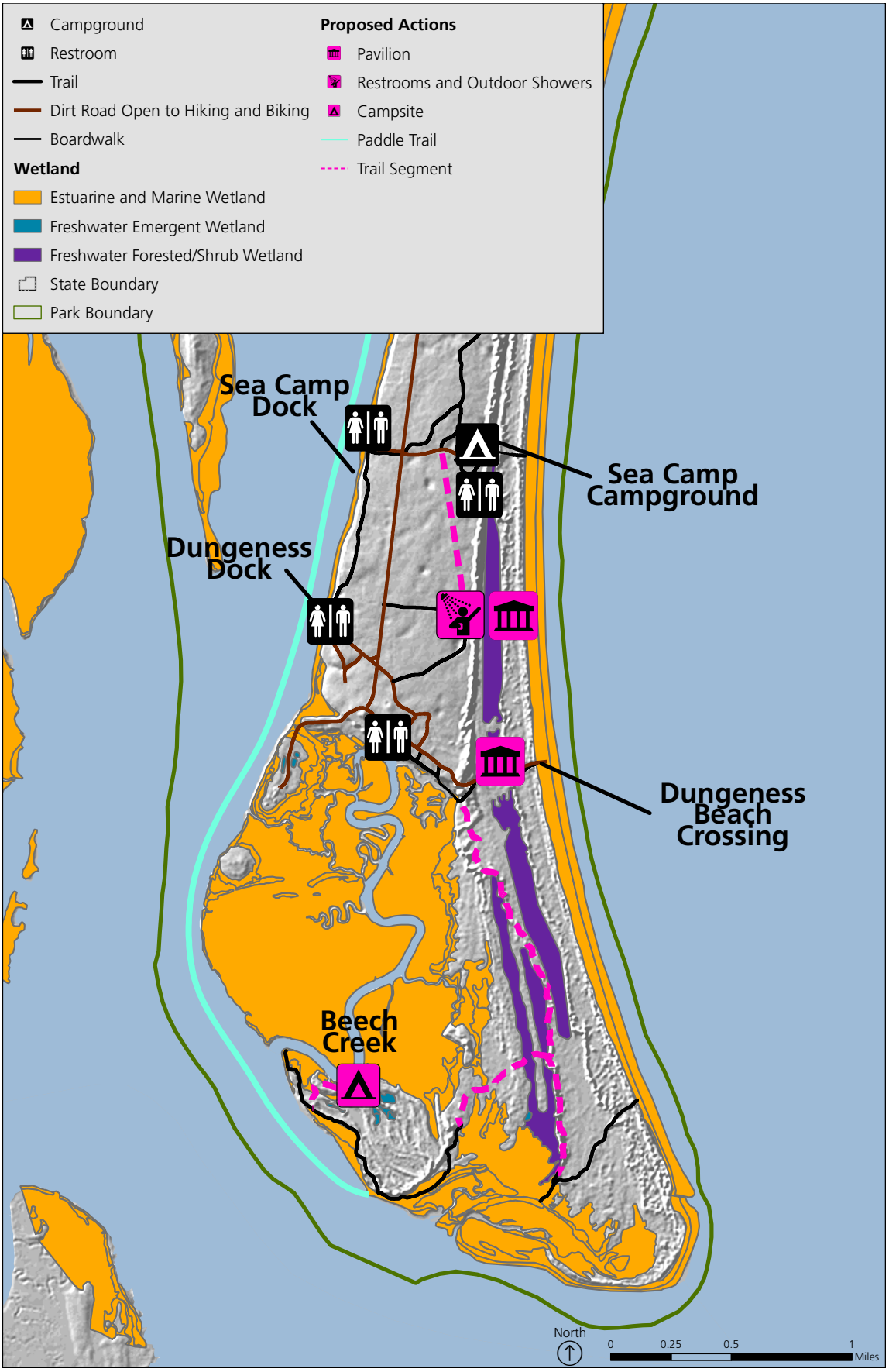


Figure 9. Potential Wetlands in the Action Area as Mapped by National Wetlands Inventory

To comply with Executive Order 11988, "Floodplain Management," any facilities or construction would be designed to reduce property losses and risk to human safety. A Floodplains Statement of Finding is included in appendix H. In accordance with the Coastal Zone Management Act, impacts on estuarine and marine wetlands require consideration for a marsh permit under the Georgia Coastal Marshlands Protection Act. Upon further design and field delineation, if impacts on this wetland type are unavoidable, the park would contact the Georgia Department of Natural Resources, Coastal Resources Division, to ensure the design and installation were compliant with local permit requirements.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above in the "Affected Environment" section. Under alternative 2, most of the proposed actions would either avoid wetland areas or be designed to minimize overlap where possible. Wetlands on the island would continue to benefit from ongoing management activities including controlled burns, management of invasive species, and management of feral hogs. Consumption and trampling and erosion caused by feral hogs and horses, ongoing motorized boat activity, and storm surges would continue to weaken the stability of wetlands on the island. Under alternative 2, proposed actions would contribute slight adverse impacts and long-term beneficial impacts on wetlands.

Conclusion. Under the no-action alternative, there would be no proposed changes to wetlands on the island. Under alternative 2, there are both long-term beneficial and long-term direct adverse impacts on wetlands as described above. Proposed trails would cross through up to approximately 915 linear feet of freshwater forested/shrub wetlands and 35 linear feet of estuarine and marine wetlands. The installation of helical piers to support a boardwalk over these stretches would result in the permanent removal of approximately 371 square feet of wetland soils and wetland vegetation. Overall functions of the wetlands would not be noticeably altered because of the small area of ground disturbance in relation to the total acres of wetlands present in the project areas.

SPECIAL STATUS SPECIES

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

The seashore encompasses both marine and terrestrial communities. Thirty-five species of mammals are found on Cumberland Island, including white-tailed deer, bobcat, opossum, raccoon, otter, mink, armadillo, bat, mole, shrew, squirrel, and several species of rats and mice. Feral animals include horses and hogs. Coyotes appeared on the island circa 2003. Dolphins, manatees, and several species of whales occur in offshore waters. More than 60 species of reptiles (44 species) and amphibians (19 species) inhabit the park, including the central newt, southern cricket frog, southern toad, Eastern narrowmouth toad, green treefrog, pine woods treefrog, squirrel treefrog, spring peeper, little grass frog, pig frog, southern leopard frog, Eastern spadefoot toad, Florida softshell turtle, common snapping turtle, mud turtle, Florida red-bellied turtle, yellow-bellied slider, alligator, green anole, six-lined racerunner, broadhead skink, Eastern glass lizard, ground skink, Eastern diamondback rattlesnake, cottonmouth, coachwhip, black racer, rat snake, banded water snake, ribbon snake, and garter snake. Special status species, including federal candidate and listed species and those identified by the State of Georgia as endangered, threatened, rare, or unusual are included in tables 10 through 14 and discussed below. For more detailed information and analysis regarding the federally listed and candidate species (including section 7 of the Endangered Species Act determinations), please see the biological evaluation in appendix G.

Special Status Mammals—

Western Indian manatees are large aquatic mammals with paired flippers and a round, paddle-shaped tail. Adults are typically approximately 9 feet (ft) in length and weigh approximately 1,000 pounds. They are known to occur in high numbers in the intercoastal waters of Cumberland Island and northern Florida, immediately south of the island. They migrate from Florida to Georgia each spring to feed on abundant marsh grass and aquatic vegetation. Some individuals go back and forth between the states throughout the summer, returning to Florida for the winter when water temperatures fall. According to the Georgia Department of Natural Resources, from April to October, manatees occur in all tidal waters throughout coastal Georgia (GA DNR 2018). At Cumberland Island, manatees are frequently seen around the boat docks on the western shoreline of the island. As in 2021, reduced food resources at key wintering sites in Florida have led to the death of 300 or more manatees along the Atlantic Coast in 2022 (GA DNR 2022). Federal agencies have declared an Unusual Mortality Event for the species, which means that Georgia's marsh habitats are much more critical for the manatee (GA DNR 2022). Additional statistical information on the health and abundance of manatees is more relevant for the State of Florida. The absence of data on manatees in Georgia has been recognized by the Georgia Division of Natural Resources and other partners and efforts are being made to tag and monitor manatees in the state.

Manatees encounter the ferry and other motorized and nonmotorized boats that frequently travel in Cumberland Sound and Beach Creek. Manatees that use both the sound and the waters around the Sea Camp and Dungeness docks on the western shore of the island are at risk of boat collisions and visitor interactions. This threat is minimized by posted signs warning boaters to be on the alert for manatees in areas they are known to frequent and continued use of best management guidelines for boat operators (see the "Mitigation Measures" section). Kayak use around the island is infrequent and disturbance to manatees from this activity is minimal.

Previous, ongoing, and future repairs of the Sea Camp and Dungeness docks on the western shore of Cumberland Island contribute noise and disturbance to nearby West Indian manatees. Increased noise and disturbance is also anticipated during construction of the planned expansion of the St. Marys Gateway Dock and the wharf at St. Marys. These planned projects would increase docking capacity and may increase the collision potential for manatees in these areas due to the impending increase in boat traffic in the St. Marys River and Cumberland Sound.

Special Status Birds—

More than 300 bird species have been documented on Cumberland Island, including full-time residents, nesters, and seasonal migrants. The island's 18 plus miles of undeveloped beach offer important habitat to winter migratory shore and wading birds. The 2012 mid-winter shorebird survey tallied 30,958 birds and 37 species. The beach and associated dunes provide attractive nesting habitat in the spring/summer months to American oystercatchers, least terns, Wilson's plovers, and willets. The Eastern shoreline of the island, including South End Beach (approximately 1,500 ft inland and 1,100 ft out to sea), is designated as critical habitat for the piping plover. Cumberland's uplands provide beneficial habitat to a variety of songbirds and neotropical migrants year-round. The island's extensive marshes offer nesting habitat for birds including clapper rails and marsh wrens. This salt, brackish, and freshwater marsh habitat also supports the Eastern black rail. The marsh is also used by shore and wading birds for foraging throughout the year. Raptors, including the bald eagle and peregrine falcon, use the marsh to hunt for food. Cumberland Island is in the Atlantic Flyway for waterfowl. The island can also support a variety of duck species, depending on annual rainfall and habitat availability.

Harris Neck National Wildlife Refuge is approximately 50 miles north of Cumberland Island. The refuge has six human-made ponds that are managed for feeding and nesting birds and has

constructed more than 100 nesting platforms for nesting wood stork. Water levels in the refuge are managed to attract wading birds, such as the wood stork, during the nesting season. The ample nesting and feeding habitat provided at Harris Neck National Wildlife Refuge may contribute to the limited presence of wood stork on Cumberland Island (Dlugolecki 2012).

State listed bird species include the threatened gull-billed tern, the threatened piping plover and the threatened Wilson's plover, the rare least tern, the rare American oystercatcher, the rare black skimmer, and rare red knot. Least terns, Wilson's plovers, American oystercatchers, and gull-billed terns are all known to nest on the island. Several of these species are also federally listed under the Endangered Species Act. Through a joint effort with Georgia Department of Natural Resources and the University of Georgia, the park assesses numbers and distribution of beach nests along with vehicle and pedestrian impacts. Begun in 1999, this represents the first substantial effort by the National Park Service to monitor nesting activity and human impacts on these rare beach-nesting birds (NPS 2000).

The presence of people and the ongoing use of bicycles and class 1, 2, and 3 e-bikes on the beach between Dungeness and Sea Camp can initiate aversive behavior in shorebirds or cause them to exert energy needed for migration (as applicable) or searching for food in these areas. Shorebird behavior associated with the presence of pedestrians can be described as exiting the area by flight; running away from oncoming bicycles and e-bikes, vehicles, or pedestrians; and running/flying to high tide wrack line to hide. In a review of studies assessing human disturbance impacts on waterbirds, Kathi L. Borgmann (2010) noted that types of disturbances that appeared more likely to cause birds to flush sooner included activities with rapid movement such as running and unleashed dogs. Staff from the Georgia Department of Natural Resources noted that in their experience, birds have faster flush response to an identified predator such as a dog than from humans on foot or bicycle. The use of bicycles, including e-bikes and traditional bikes, on the beach can disturb foraging shorebirds, depending on the location and frequency of their presence. Many shorebirds are more frequently found in low wave energy locations on the northern or southern tips of the island, where bicycles and e-bikes are not allowed on the beach, and are harder for visitors to access.

The presence of migratory shorebird species fluctuates for different species at different times of the year with overlap during the heaviest visitor use times in these areas. At South End Beach, the high volume of visitors along the whole beach and the frequent presence of dogs disturbs nesting and foraging birds and can compromise nesting success. These risks vary widely depending on the time of year, the number of nesting birds, and the behavior of visitors and their pets.

Higher use of the South End Beach habitat is anticipated to correlate with high visitor use in this location, which in recent years has peaked from March through July and again in late fall (NPS 2019b). Despite the full eastern shoreline being critical habitat for the piping plover, most shorebirds, including the plover, typically prefer low wave energy areas, such as those at South End Beach and along the beaches at the northern tip of the island. Additional disturbances to shorebirds on the island occur from ongoing use of motorized boats in the Beach Creek area and around the island in general. This disturbance is greatest in quieter areas with less wave action.

Park staff post educational signage and temporary exclosure areas seasonally at known shorebird nesting areas to protect nests from trampling and disturbance.

Permanent residents of the island who hold permits can drive on the island's beaches. While this activity is prohibited from 30 minutes before sunset to 30 minutes after sunrise during turtle nesting season between April 1 and October 30, the activity is still permitted during the day and, depending on the location and frequency of vehicles, can disturb foraging shorebirds.

Special status species birds will continue to be affected by sea level rise, changing temperatures, increased storm intensity and frequency, and the availability of food, foraging, and nesting habitat.

If constructed, the use of the proposed Camden Spaceport for rocket launches and landings will be audible from portions of the island where special status birds may be present. Depending on the circumstances and conditions, it is possible a sonic boom, sounding similar to a clap of thunder, may be heard from portions of the island, including areas where birds may be present.

Special Status Reptiles—

Special status species reptiles known or with potential to occur on Cumberland Island include a turtle, a tortoise, a frog, and four species of sea turtles.

Diamond back terrapins are known to occur on the island. While there isn't a lot of data regarding their population numbers, threats to hatching success on the island include raccoon and feral hog depredation.

The gopher tortoise occurs in several locations on the island and in varying colony sizes. This species is known to inhabit two Georgia barrier islands, Cumberland being one, and was likely introduced by humans in both cases. Although never recorded on the island, there is potential for the gopher frog to occur because of the presence of the gopher tortoise and areas of suitable habitat. The frogs generally occur only where gopher tortoise are present. Previous and continued fire management, including the use of prescribed burns in the fire-dependent plant communities present on the island, has reduced the potential for catastrophic wildfire and fostered the restoration of longleaf pine and other native fire-adapted vegetation communities preferred by the gopher tortoise, the gopher frog, and several other sensitive species.

Special status reptiles would continue to be affected by sea level rise and the availability of beach habitat, changing temperatures, increased storm intensity and frequency, and the availability of food, foraging, and nesting habitat.

Federally and state listed sea turtles on the island represent some of the best studied, and of these marine turtle nesting has been the most extensively documented. Critical threats to sea turtle nesting and hatching success on the island are raccoon and feral hog depredation and nest inundation. The turtle monitoring efforts to screen nests, selectively relocate them, implement predator reduction efforts, and educate visitors have proven effective in increasing the success of loggerhead sea turtle hatching on the island. Nest protection and monitoring efforts for the entire 17-mile shoreline has been in place since 1992. While green sea turtles rarely nest in Georgia, Cumberland Island does provide seasonal nesting habitat. Turtle nest totals at the national seashore have shown a general increasing trend. Kemp's ridley sea turtle and leatherback sea turtle nests have been documented on Cumberland Island, although rarely. Kemp's ridley sea turtle nesting data for Cumberland Island National Seashore from 2009 to 2019 recorded two nesting events, both in 2017 (GA DNR 2019). Over the past 10 years, there have been 10 leatherback nests recorded on Cumberland Island by the Georgia Department of Natural Resources Sea Turtle Conservation Program (2019). Cumberland's 18-mile undeveloped beach is one of the most important loggerhead sea turtle nesting areas in Georgia (NPS 2019). Each year it accounts for 25% to 30% of the statewide nesting total. In the last 3.5 seasons, Cumberland has produced more than 1,800 nests (NPS 2019). In 2019, there were more than 1,000 loggerhead nests documented by the Georgia Department of Natural Resources Sea Turtle Conservation Program (2019), which was the largest number of nests since 2016. Critical threats to nesting and hatching success on the island are raccoon and feral hog depredation and nest inundation. A portion of nests are lost each year to storm and tidal activity.

Diamondback terrapins and sea turtles are impacted by visitor disturbance and natural predation of eggs from a variety of terrestrial predators. While the use of bicycles on the beach at night is not known to occur with any frequency, it is not prohibited during nesting season the same way beach driving is and therefore may result in limited disturbance to nesting turtles.

Vehicles driving on the beach are a threat to nesting sea turtles because of the collision potential and resulting tire ruts. Island residents who have a Georgia-issued beach driving permit for Cumberland Island are permitted to drive their vehicles on the beach. Having to negotiate vehicle tire ruts increases the amount of time and energy expended by hatchlings attempting to reach the ocean, thereby increasing the chance they will be lost to predators or to desiccation during daylight hours. The risk for potential vehicular collisions is mitigated by restrictions between April 1 and October 30 that prohibit permit holders from driving on the beach between 30 minutes before sunset to 30 minutes after sunrise.

The park's sea turtle monitoring program, which utilizes interns who patrol the beach from May through October each year, documents nesting sea turtles on the island and works to improve their nesting success.

Special Status Fish—

Eighty-nine species of fish have been identified in the fresh, brackish, and saltwater habitats of Cumberland. Special status fish with the potential to occur in the waters around Cumberland Island include Atlantic and shortnose sturgeon. Atlantic sturgeon live in rivers and coastal waters of the Atlantic coast. In a recent study, 20 migrant Atlantic Sturgeon were detected in the lower St. Marys River and Cumberland Sound. The number and seasonal presence of sturgeon indicate that the St. Marys River estuary may be an important seasonal habitat for the species, particularly for nonspawning, migratory life stages. Most of the migrant individuals were only detected in Cumberland Sound and not in St. Marys River, and few to no migrant Atlantic sturgeon were detected during the warmest months (June–November) of the year (Fox et al. 2018).

There is a slight potential for vessel strikes to Atlantic and shortnose sturgeon from boat use in the St. Marys River and Cumberland Sound. This risk would increase with the potential for additional boat traffic in the area following the completion of the planned expansion of the St. Marys Gateway Dock and the wharf at St. Marys.

Special status fish would continue to be affected by changing water temperatures, increased storm intensity and frequency and the resulting availability of food.

Table 10. Mammal Species of Special Concern with the Potential to Occur at Cumberland Island

Species	Federal Status1	State Status1	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
West Indian manatee *Trichechus manatus*	T	E	No	In coastal Georgia, manatees occur in tidal freshwater, brackish, and marine environments. Their typical coastal and inland habitats include coastal tidal rivers and creeks such as the Cumberland River and Cumberland Sound area, salt marshes, and freshwater springs (Smith 1993).	Habitat loss and degradation and mortality from boat collisions. Manatees are slow moving and on average swim 3 to 5 miles an hour. In the area of the national seashore, human-related threats include mortality and injury from collisions with watercraft and entanglement in fishing gear.	Manatees are observed regularly in the St. Mary's River, tidal creeks, and the ocean. Critical habitat for the species does not exist in the national seashore but is present south of the island in Florida.	Yes

The USFWS species list (USFWS 2019a, USFWS 2022a) was obtained from IPaC website on 8/1/2019 and confirmed 9/7/22. The Georgia State species list was obtained from the Georgia Biodiversity Portal on 8/6/2019 and confirmed 9/7/22. Species and critical habitat not having the potential to occur were excluded from further review with a no effect determination and associated rationale, below. N/A=Not applicable

[1] **Status Codes**: **E**=federally or state listed endangered; **T**=federally or state listed threatened; C=candidate for listing; **CH**=designated critical habitat[2] ; R=state listed rare; U=state listed unusual

Table 11. Bird Species of Special Concern with the Potential to Occur at Cumberland Island

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Eastern black rail *Laterallus jamaicensis ssp. jamaicensis*	T	T	NA	Along the southern Atlantic coast, Eastern black rail habitat includes salt and brackish marshes. They require dense vegetation that allows their movement beneath. This dense plant structure has been found to be more important than plant species composition in predicting habitat suitability.	The Eastern black rail is threatened by habitat fragmentation and alteration as a result of climate change and development. They are also impacted by environmental contaminants such as chemical spills, disease, human disturbance, and altered food webs.	The tidally and nontidally influenced salt, brackish, and freshwater marsh habitats around the western portion of the island provide habitat for the Eastern black rail.	Yes
Bald eagle *Haliaeetus leucoce-phalus*	NA	T	NA	Inland waterways and estuarine areas in Georgia. Eagles are abundant on the island during the winter and early spring months due to an influx of wintering eagles from the north. There are two to three nests annually on the island.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.	Construction of proposed new amenities would maintain a 330 to 660-ft (if visible from the nest) buffer from any active nests. Any clearing or construction activity within 660 ft would take place outside of the breeding season. Dismissed from further analysis because there would be no anticipated impacts with implementation of mitigation measures.	No
Gull-billed tern *Sterna-nilotica*	Not listed in Georgia	T	NA	Nests in colonies on sandy sites; forages over salt marsh, dunes, and other grassy areas for insects, spiders, and other invertebrates.	Nest disturbance and loss of habitat to beach-front development are the major threats to this species.	Known to be vulnerable to high levels of human disturbance.	Yes
Piping plover *Charadrius melodus*	T	T	Yes	Winters on Georgia's coast; prefers areas with expansive sand or mudflats (foraging) in proximity to a sand beach (roosting).	Piping plover are threatened by destruction and degradation of habitat, shoreline erosion, human disturbance, and predation. Driving on beaches displaces	The Atlantic Coast and Northern Great Plains population and the Great Lakes watershed	Yes

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
					piping plovers from preferred areas and can result in increased energy expenditure. In wintering sites, human disturbance has been shown to limit local piping plover abundance with dogs increasing the disturbance further.	population are known to occur on the island.	
Wilson's Plover *Charadrius wilsonia*	NA	T	NA	Atlantic Coast breeding populations range from New Jersey to northern South America. Nesting habitat includes beaches, sand flats, and spits.	Loss of nesting habitat from human development; predation from wild, feral, and domestic animals; and human disturbance in the form of pedestrians and vehicles are primary threats to this species.	Wilson's plovers nest along the entire stretch of Cumberland's beach annually and are considered solitary nesters.	Yes
Least Tern *Sterna antillarum*	Not listed in GA	R	NA	Atlantic Coast breeding populations range from Massachusetts to Florida. Nesting colonies have been documented in all Georgia coastal counties. Known to occur on sandy beaches, sandbars, dredge islands.	Human disturbance of nesting colonies is the primary threat to this species' success. Predation also is a concern.	Least tern nesting on Cumberland is variable each year, with potential colony sites including the dunes adjacent to the North Cut Road access and the sand flats on the north and south ends of the island.	Yes
American Oyster-catcher *Haemato-pus palliates*	NA	R	NA	Nests on marsh islands, upland dunes, beaches, and dredge spoils. Atlantic Coast population nests from Massachusetts to southern Florida.	Human disturbance, loss of nesting habitat to development, and predation are known threats to this species' success.	The Georgia coast, including Cumberland, also supports flocks of oystercatchers throughout the winter. Mid-winter waterbird survey data from 2003 to 2008 documented oystercatcher numbers on Cumberland ranging from 34 to 66 birds.	Yes
Black Skimmer	NA	R	NA	Atlantic Coast population nests on barrier island beaches and human-	Main threats include loss of nesting habitat due to beachfront	Black skimmers are colonial nesters and have been observed	Yes

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Rynchops niger				made dredge spoil islands primarily in the mid-Atlantic states. Winters in southern US and Caribbean.	development and human disturbance at nesting colony sites.	nesting in mixed species colonies on sandy beaches, salt marshes, and dredge spoil islands.	
Red Knot *Calidris canutus*	T	R	No	Nests in the Arctic and winters on southern tip of South America. Georgia coast serves as a stopover for winter/early spring migrants. Beaches, river mouth/tidal river, tidal flat/shore. There is no nesting habitat on the island, but they have been recorded foraging on the island during spring and fall migrations.	Reduction in population is thought to be related to lack of preferred food sources during migration and the resulting decline in health.	Red knots undertake one of the largest annual migrations known in the world. Red knots are seen annually on Cumberland during the winter. Mid-winter waterbird survey data from 2003 to 2008 documented red knot numbers ranging from 72 to 673 birds.	Yes
Red-cockaded wood-pecker *Picoides borealis*	E	E	No	Habitat of open, mature pine woodlands. Prefer open savanna with scattered overstory of mature pines and dense groundcover.	Reduction of older age pine stands and encroachment of hardwood mid-story in older age pine stands because of fire suppression.	Historically was present on Cumberland Island, but currently not known to occur per conversations with park staff and USFWS staff. Dismissed from further analysis.	No
Wood stork *Mycteria americana*	T	E	No	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps. Active rookeries were located in Camden County 1991 to 2002.	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/ flooding, raccoon predation on nests, and human disturbance of rookeries. Dry conditions on the island and increased vegetative cover in areas has allowed predators to access former nesting areas that were previously protected by water.	Known to occur on the island, but the last known nesting area was in the Sweetwater Lakes / Lake Whitney area in 2002. The freshwater marsh, swamps, lagoons, ponds, and brackish wetland habitat of the island are still used as foraging grounds throughout the year.	Yes

Table 12. Insect Species of Special Concern with the Potential to Occur at Cumberland Island

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Monarch Butterfly *Danaus plexippus*	C	NA	NA	In Georgia, the butterfly is found in open habitats and depends on a variety of native milkweed species and plants that produce nectar. They migrate across Georgia in the fall as they head towards the mountains of Mexico. They return to Georgia and other states in the spring as they return north.	North American monarchs are threatened by development and changes in their breeding habitat. The species have been affected by the recent loss of milkweed caused by widespread use of genetically modified herbicide-tolerant corn and soybeans and the use of the herbicide glyphosate on these crops (NatureServe 2022).	The butterfly was noted as a candidate for listing in December 2020 but is not yet listed under the Endangered Species Act. While the butterfly is declining across their native range in North America, they have been ranked as "S4, Apparently Secure" in Georgia (NatureServe 2022).	Yes

Table 13. Reptile Species of Special Concern with the Potential to Occur at Cumberland Island

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Diamondback terrapin Malaclemys terrapin	NA	U	NA	Entire coast, estuarine and marine edge; all saltmarsh, beaches.	Primary threats to terrapins include habitat destruction, drowning in fishing gear, and vehicle strikes.	Known to occur in estuarine and saltmarsh areas on the island.	Yes
Eastern indigo snake	T	T	No	During winter, den in xeric sand ridge habitat preferred by gopher tortoises; during warm months, forage in creek	Habitat loss due to uses such as farming, construction, forestry, and pasture and to over collecting for the pet trade.	Per the NPS Integrated Resource Management Applications species lists for Cumberland Island National Seashore, park	No

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Drymarchon corais couperi				bottoms, upland forests, and agricultural fields.		staff, and USFWS input, the species is not known to occur on the island. The snake requires large areas of territory, which are not available on the island. Dismissed from further analysis.	
Gopher frog Lithobates capito	C	R	NA	Inhabits native xeric uplands, particularly longleaf pine-turkey oak associations. Generally, occurs only where gopher tortoise is present. Breeding occurs in ephemeral to semi-permanent freshwater wetlands that do not contain large predatory fish.	Primary threats to the frog include urban development, agricultural conversion, and habitat fragmentation.	Not known to occur on the island, but potential habitat is present.	Yes
Gopher tortoise Gopherus polyphemus	C	T	NA	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting.	Primary threats to the tortoise include urban development, agricultural conversion, and habitat fragmentation. These threats are not as prevalent in the national seashore and as such, the tortoise population on Cumberland Island is growing.	Cumberland's population is known to exist from Stafford Field southward to the Greyfield Inn property.	Yes
Green sea turtle Chelonia mydas	T	T	No	Marine turtles that come to shore to nest. Nesting generally occurs at night, on beaches, and typically on islands. Most nesting occurs on high energy beaches with deep sand.	Major threats vary across the green sea turtle's range, but along the Georgia coastline include degradation of nesting habitat, including beach lighting, which can disorient hatchlings and/or nesting females; predation on eggs and hatchlings by raccoons, dogs, etc.; mortality in fishing gear and other entangling debris; collisions with power boats;	Cumberland Island provides nesting habitat for a small population of green sea turtles.	Yes

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
					contact with chemical pollutants; and epidemic outbreaks.		
Hawksbill sea turtle Eretmochelys imbricata	E	NA	No	This species is typically found in pantropical and warm-temperate regions.	The greatest threat is from commercial harvest and subsistence. Other threats include destruction of nesting and breeding locations from light pollution, incidental take, and exposure to pollutants and contamination.	Known to occur infrequently on the Atlantic coast of central and south Florida and the Florida Keys (NatureServe 2022). While the turtle has been seen in the vicinity of the island, it is not known to nest on the island.	Yes
Kemp's Ridley Lepido-chelys kempii	E	E	No	Open ocean; sounds; coastal rivers; beaches.	Threatened by harvesting of eggs, accidental capture in fishery trawls, loss or degradation of nesting habitat, and sea level rise. In addition, nest depredation by mammals and ghost crabs poses a serious threat to marine turtle populations.	Known to nest on the island, although rarely.	Yes
Leatherback sea turtle Dermo chelys coriacea	E	E	No	Marine turtles that come to shore to nest. Nesting generally occurs at night, on beaches in the Western Hemisphere between March and August.	Major threats vary across the leatherback sea turtle's range, but along the Georgia coastline they include coastal development, beach armoring, dredging, and beachfront lighting, which can disorient hatchlings and/or nesting females. Eggs and hatchlings incur high rates of mortality from predation and adults often die from drowning in commercial fishing nets and from eating floating debris, especially plastic.	Leatherback turtles have been known to nest in small numbers on Cumberland Island.	Yes

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
					Vessel strikes can also injure or kill leatherback sea turtles.		
Loggerhead sea turtle Caretta caretta	T	E	Yes	Found worldwide, primarily in subtropical and temperate ocean waters. Nest primarily along the Atlantic coast of Florida, Georgia, South Carolina, and North Carolina. Cumberland's 18-mile undeveloped beach is one of the most important loggerhead sea turtle nesting areas in Georgia (NPS 2019a).	The primary threat to loggerhead sea turtles worldwide is bycatch in fishing gear, primarily in trawls, longlines, and gillnets. Within the area of Cumberland Island, other threats include ingesting ocean debris and becoming entangled in ocean pollution.	Cumberland Island is one of the most important loggerhead nesting areas in Georgia and annually accounts for 25% to 30% of the statewide nesting totals.	Yes

Table 14. Fish Species of Special Concern with the Potential to Occur at Cumberland Island

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Atlantic sturgeon Acipenser oxyrinchus oxyrinchus	E	E	No	Migratory species that hatch in freshwater rivers, head out to sea as juveniles, and return to their birthplace as adults to spawn or lay eggs. Known to occur in the St. Marys River main stem north of Cumberland Island and seasonally in Cumberland Sound, along the western shoreline of the island (Fox et al. 2018).	Unintended catch in commercial fisheries, dams that block migration, poor water quality, dredging in spawning areas, water withdrawals, and vessel strikes.	Known to occur in the St. Marys River main stem north of Cumberland Island and seasonally in Cumberland Sound.	Yes
Shortnose sturgeon Acipenser breviros-trum	E	NA	No	Live in rivers and coastal water from Canada to Florida. Spend relatively little time in the ocean. Recently discovered in both the Satilla and St. Marys Rivers, just west of Cumberland Island.	Unintended catch in commercial fisheries, dams that block migration, poor water quality, dredging in spawning areas, and water withdrawals.	Known to occur in both the Satilla and St. Marys Rivers, just west of Cumberland Island.	Yes

Table 15. Plant Special of Special Concern with the Potential to Occur at Cumberland Island

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Climbing buckthorn Sageretia minutiflora	NA	T	NA	Calcareous rocky bluffs, forested shell middens on barrier islands, and evergreen hammocks along stream banks and coastal marshes. Recorded from five counties in Georgia.	Conversion of habitat and development.	This species could not be located during 2009 vascular plant surveys. In addition, there are no proposed actions within its habitat. Dismissed from further analysis.	No

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Morzenti's spleenwort Asplenium heterore-siliens	NA	T	NA	Marl outcrops, damp limestone ledges, and tabby masonry. Recorded from three counties in Georgia.	Degradation of habitat by development and exotic species.	Has not been recorded on the island. No proposed actions within habitat. Dismissed from further analysis.	No
Velvet/ Sandy Woods Sedge Carex dasycarpa	NA	R	NA	Well-drained sandy soils in a variety of habitats including mixed pine-hardwood forest, stream terraces, floodplain swales, maritime forests, barrier islands, and beech-magnolia-spruce pine forests.	Conversion of habitat to agriculture and development. Invasion by exotic species.	This species is known to occur on the island.	Yes
Greenfly orchid Epidendrum magnolia	NA	U	N/A	The limbs of both the southern magnolia and live oak trees in moist forests. Typically found along streams.	Removal by people and clearing in lowland forest habitat.	This species is known to occur on the island with resurrection fern and live oak (NPS 2008 vascular plant survey). Removal of mature live oak trees is not anticipated, therefore impacts on this species would be avoided and it was dismissed from further analysis.	No
Florida wild privet Forestiera segregate	NA	R	NA	Dry coastal hammocks, scrub, and thickets.	Clearing and development of coastal habitat.	This species is known to occur along the margin of Beach Field, which is west of Nightingale Beach. There are no proposed actions in this area and therefore no anticipated impacts on this species.	No

Federal Status	Federal Status	State Status	Critical Habitat	Habitat Description	Threats	Potential to Occur / Notes	Carried Forward for Analysis
Soapberry Sapindus marginatus	NA	R	NA	Deciduous tree that grows in coastal hammocks. Prefers dry or moist soils.	Clearing and development of coastal habitat.	Not in south end habitat per conversation with park staff. Could not be found during 2008 vascular plant survey. Dismissed from further analysis.	No
Hooded pitcherplant Sarracenia minor var. minor	NA	U	NA	Hooded pitcher plant found in inland wetlands.	Degradation of habitat by development and exotic species.	Not known to occur on the island. Dismissed from further analysis.	No
Pond spice Litsea aestivalis	NA	R	NA	Shrub or small tree that grows up to 10 ft in height. Grows on the edge of swamps, cypress ponds, depression ponds, and Carolina bays.	The draining and filling of wetlands, fire suppression, digging by feral hogs, and disease. Changes in hydrology from climate change and excessive pumping are also a threat.	Not known to occur on the island. Dismissed from further analysis.	No
Wild coco Pteroglossaspis ecristata	NA	T	NA	Perennial herb that grows up to 5.5 ft and is found in grassy saw palmetto barrens and longleaf pine grasslands and disturbed clearings in these habitats.	Destruction of habitat by conversion of habitat for development and exotic species. Also threatened by fire suppression.	Not known to occur on the island. Dismissed from further analysis.	No

The shortnose sturgeon is a unique fish that appears to be covered in armor. They were considered extinct in the vicinity of Cumberland Island, but were recently found again in both the Satilla and St. Marys Rivers, which are west of the island at the north and south ends, respectively (NOAA 2019). In the southern United States, spawning adults generally migrate upriver between January and April (NOAA 2019). They hatch in freshwater rivers and spend most of their lives in the estuaries of these rivers. During their lifespan, they spend little time in the ocean and typically stay near shore when they do enter marine waters. In the spring, adults move far upstream to freshwater to spawn and rapidly return to the estuaries once spawning is complete.

Special Status Plants—

Velvet sandy woods sedge is a perennial grass-like flowering herb that is commonly found in weedy, lawn-like areas at Dungeness Mansion and Plum Orchard. The sedge is wind-pollinated, but little is known about its seed dispersal. Negligible impacts on the velvet sandy woods sedge occur from ongoing maintenance, competition with invasive species, horse, and human disturbance.

Impacts on Special Status Species

Alternative 1, No-Action Alternative. Under the no-action alternative, impacts on special status species would remain the same as described in the affected environment. The current resource threats and impacts on special status species would continue to occur.

Alternative 2, NPS Preferred Alternative. Impacts from the implementation of alternative 2 are described below.

Special Status Mammals—

Under the preferred alternative, there are no in-water proposed actions and there is no in-water construction required to accommodate the expanded ferry service and therefore no impacts on West Indian manatee habitat. If implemented, expansion of the ferry service would result in passenger ferries regularly traveling farther north within Cumberland Sound to Brickhill River. In addition, extending the season for mid-afternoon departures and potentially extending the hours of operation during the summer season would result in passenger ferries being present in a greater extent of the sound later in the season and later in the day. Manatees congregate at the boat docks on the western shore of the island because they are drawn to shallow waters and the margins of nearby marshes to feed.

According to mortality data from the Manatee Carcass Salvage Program, the leading cause of manatee injuries and deaths in Florida, which is immediately south of Cumberland Island, are boat collisions (USFWS 2007). The increased ferry service would overlap the season when manatees are most likely to be in the waters around Cumberland Island (April through October) and therefore, the risk of boat collisions and visitor interactions with manatees would slightly increase during these months resulting in an adverse impact on individual manatees.

The availability of kayak/canoe rentals on the island could increase the number of interactions between kayakers and manatees in the vicinity of the island; however, kayaking around the island and kayak camping is currently allowed and the national seashore sits at the southern end of the already established Southeast Coast Saltwater Paddling Trail, which covers 800 coastal miles between Virginia and Georgia. Kayaks do not have motorized propellers, are light and shallow-hulled watercraft, move at a slower, human-propelled speed, and therefore, do not pose a collision threat to manatees. If kayak rentals were placed in proximity to areas where manatees are known to congregate, staff would identify and designate a zone on the beach where renters could safely enter and exit the water without disturbing the manatees. Kayak renters would be educated on safe

distances to maintain from the animals to ensure their protection and minimize the potential for disturbance.

Manatees are also known to frequent the tidal marsh areas of Beach Creek. While powerboats frequently access Beach Creek now, they typically stay in the deeper channels. The establishment of the Beach Creek campsite could slightly increase the use of powerboats in the area and their frequency to approach shallower water around the campsite, especially in the first half-mile approach to the campsite from the southern inlet.

These increased risks for vessel collisions and disturbance would be mitigated by additional educational signage around the docks and installation of signage in areas, such as Beach Creek, where manatees are known to congregate. Vessel speed would be posted and further enforced around the ferry landing docks, and no-wake zones would be posted in areas, including Beach Creek and smaller unnamed creeks south of Beach Creek, resulting in beneficial impacts on manatees. In addition, park staff would encourage slower motorized boat speeds and actively educate visitors on do's and don'ts regarding sensitive species and areas. Ferry service operators currently follow boater best management guidelines when operating the ferries, which include for example, keeping their vessels in deeper water whenever possible, operating at a no-wake speed when approaching the docks, watching for manatees around known congregation areas, wearing polarized glasses to reduce glare, and avoiding passing directly over visible manatees. These same guidelines would be followed for expanded ferry services and routes. To date, there has not been a recorded manatee collision by the ferries traveling to the national seashore. With the implementation of these mitigation measures, the risk to individual manatees would be minimized.

Special Status Birds—

Under the preferred alternative, there are several proposed actions that provide additional access options to areas of the island that are currently less frequented by visitors. These actions include the Nightingale Beach Trail, realignment and expansion of the South End Trail, expanded ferry service to Plum Orchard, public camping at Hunt Camp, extending bicycle and class 1, 2, and 3 e-bike use on the beach between Stafford Beach and Dungeness Crossings, and the addition of the Beach Creek, Toonahowie, and Sweetwater Lakes campsites.

The increased potential for the presence of people on the beaches used by nesting and foraging shorebirds would increase disturbance to these species beyond what is currently experienced. The highest visitation numbers at South End Beach have been recorded on weekends in July, when several species of shorebirds are known to be present. The magnitude of increased disturbance would be small and less at South End Beach than in other locations. Please see the biological evaluation in appendix G for an analysis of impacts on critical habitat for piping plover.

Persistent increased pedestrian presence may initiate aversive behavior to the level where the birds seek more remote feeding and resting sites. The continued and expanded use of both bicycles and class 1, 2, and 3 e-bikes on the beach between Stafford Beach and Dungeness Crossings could initiate aversive behavior in shorebirds or cause them to exert energy needed for migration (as applicable) or searching for food in these areas. Under alternative 2, bicycles, including e-bikes and traditional bikes, would be subject to the same seasonally reduced speed limits as motor vehicles on the beach (between April 1 and July 31) and dusk and dawn restrictions (between April 1 and October 30). However, the activity is still permitted and, depending on the location and frequency of bicycles and e-bikes, can disturb foraging shorebirds. Staff from the Georgia Department of Natural Resources noted that in their experience, birds have faster flush response to an identified predator such as a dog than from humans on foot or bicycle/e-bike. Given the naturally high ambient noise levels caused by wave action along the beaches on the island, the noise generated by e-bikes is not anticipated to

result in impacts on special status bird species. In addition, many shorebirds are more frequently found in low wave energy locations on the northern or southern tips of the island, areas where bicycles and e-bikes are not allowed on the beach.

Establishment of the Beach Creek campsite could slightly increase the number of small motorized and nonmotorized boat use on Beach Creek around the campsite. While the fast-moving and loud disturbances created by motorized boats are generally thought to be more disturbing to shorebirds and marsh birds, nonmotorized boat traffic such as kayaks can also cause birds to flush (Borgmann 2010). Due to heavier wave action on the eastern side of the island, kayak use is anticipated to be more common on the western intercostal waters. Beach Creek is currently used by motorized boats and its designation as a no-wake zone would reduce the noise and level of disturbance resulting in beneficial impacts on shorebird and marsh bird species in this area.

At South End Beach, impacts on shorebirds would be mitigated by the establishment of an approximately 1,900-ft-wide visitor access and boat landing and anchoring area that would guide visitor use away from an established environmental protection zone on the western portion of South End Beach, which is frequently occupied by shorebirds. Closing the designated protection zone to visitors would protect foraging shorebirds in this area. In addition, South End Beach would be designated as a dog-free area, which would eliminate the disturbance from off-leash dogs that currently exists. The installation of signage at South End Beach and in other areas of the national seashore would provide information on shorebirds, marsh birds, and other sensitive species and inform visitors of do's and don'ts to protect them and their habitat. Together, these efforts would reduce disturbance to shorebirds and result in beneficial impacts when compared to current conditions.

In addition, part of the proposed management action includes implementing indicators and thresholds for management strategies. Staff would monitor for people entering posted closures (temporary or permanent) of sensitive shorebird areas and would implement adaptive management strategies to reduce disturbance if more than two consecutive monitoring reports of people entering a posted closure or visitor-related disturbance in a posted closure occur during the monitoring period/season. Monitoring human disturbance on nesting shorebirds could coincide with ongoing shorebird surveys. Although many special status shorebirds and marsh birds do not nest on the island, their foraging and resting habitat can overlap the posted sensitive areas of those that do. Implementation of adaptive management strategies to maintain these objectives would result in slight beneficial impacts on shorebirds.

Across the island, impacts on special status shorebirds and marsh birds would be minimized by the beneficial effects that additional enforcement and additional educational signage would provide. Additional enforcement in various locations on the island would seek to reduce disturbances and benefit shorebirds, marsh birds, and other wildlife. In addition, monitoring shorebirds takes place annually on the island and would continue under the preferred alternative, providing a data set for comparison to further inform adaptive management.

There are no proposed actions in the freshwater marsh, swamps, lagoons, ponds, and brackish wetland habitat of the island that are still used as foraging grounds for the wood stork and Eastern black rail. The last known nesting area for wood storks was in the Sweetwater Lakes / Lake Whitney area in 2002. Optimal freshwater emergent wetland habitat for the wood stork is more abundant in the northern portion of the island and is not present near the proposed new trails, pavilions, or bathhouse; therefore, the construction and occupation of these facilities is not anticipated to adversely impact the wood stork. The new Sweetwater Lakes wilderness campsite would avoid the stork's habitat, but it would be located along the trail approximately 250 ft from nearby freshwater emergent wetlands. The creation of this campsite, coupled with expanded ferry service to Plum

Creek, which is closer to this area of the park, could increase use of the Roller Coaster Trail that traverses closer to this optimal habitat for the wood stork. Wood storks have also been documented at the Plum Orchard Pond, which is 200 ft north of the mansion and directly adjacent to Brickhill River and the associated marsh. The potential increased presence of people in these areas that could be used by foraging wood storks and/or Eastern black rail could increase disturbance to these species beyond what is currently experienced, depending on the location of these people and their activities. However, there is a vegetative barrier between the Plum Orchard Pond and the mansion, there are no trails or amenities that would draw people toward the pond, and a visitor capacity of 45 people would be established on the grounds around Plum Orchard at any one time (not including visitors in the house).

Special Status Insects—

The construction of new trails, utilities, a bathhouse, and pavilions, and the addition of campsites would remove small areas of vegetation and provide additional access options to areas of the island that have been less frequented.

There is the potential for single milkweed plants to be removed as part of vegetation clearing for these proposed actions; however, the locations of the proposed structures in the dune fields and in shaded forest are not ideal conditions for most milkweed species that prefer open conditions with access to sun and sandy soils. The majority of the South End Trail would cross through sandy upland sparsely vegetated areas, so vegetation removal is expected to be minimal. Following the completion of these elements, disturbed areas would be allowed to recover naturally or be revegetated with native plant species.

During construction there could be some temporary disturbance to monarchs butterflies, if present, from the noise from machinery and workers in these site-specific locations. However, the noise would be mitigated using best management practices for mechanized equipment and from the sound of nearby wave action of the Atlantic coast. Upon completion, the addition of these two pavilions and a bathhouse at Nightingale could reduce dune trampling by visitors in these areas resulting in a beneficial impact on monarch habitat. These temporary disturbances may temporarily agitate individual monarchs but are not expected to displace the species from the island.

Special Status Reptiles—

Diamondback terrapins are most frequently found in salty marshes such as those along portions of the western coast of the island, including the tidal marsh areas of Beach Creek. The establishment of the Beach Creek campsite could slightly increase the use of powerboats in the area and their frequency of approaching shallower water around the campsite, especially within the first half-mile approach to the campsite from the southern inlet. Similar to what was described above for manatees, the increased risk for vessel collisions and disturbance as a result of this use would be mitigated by posted vessel speed limits, further enforcement, and the establishment of a no-wake zone in areas, including Beach Creek and other smaller unnamed creeks in that area. In addition, park staff would encourage slower motorized boat speeds and actively educate visitors on do's and don'ts regarding sensitive species and areas. These measures would minimize any adverse impacts on diamondback terrapins and may result in beneficial impacts when compared to current conditions.

Most of the proposed actions would occur south of the currently known range for the gopher tortoise on the island (NPS 2008). The expansion of ferry service to Plum Orchard, allowing the public to camp at Hunt Camp campground, and the addition of two wilderness campsites could result in increased use of existing trails in areas the gopher tortoise is known to inhabit. While tortoise burrows would be unlikely in the proposed wilderness campsite locations, the area would be surveyed to ensure avoidance prior to any vegetation clearing at these two campsites.

There would be no direct impacts on gopher tortoise or potential Carolina gopher frog habitat under the proposed actions. However, expanded access and new camping opportunities could increase visitor use in portions of the island that provide tortoise and frog habitat, which could increase disturbance to individual tortoises. Expanded types of motorized concessions tours could slightly increase the number of vehicles on the road and the risk for vehicle strikes. However, tour operators would be advised of the potential for tortoises on the road and what to do if one is encountered.

As discussed above, under the proposed action, there are several proposed actions that provide additional access options to areas of the island that have been less frequented. The northern 5 miles of the island consistently records the highest density of nesting activity for loggerhead sea turtles (NPS 2000); however, the southern end and an area north of Stafford Beach are increasing in importance as nesting areas. General expanded ferry service to the island and additional access to various portions of beach along the eastern seashore may lead to increased pedestrian tracks on some sections of beach, and these tracks may have a small effect on the ability of sea turtle hatchlings to reach the ocean (Hosier et al. 1981). In addition, research has shown that travel times of hatchlings from the nest to the water may be extended when traversing areas of heavy foot traffic (Hosier et al. 1981) or bicycle tracks; the same is true of debris on the beach. Hatchlings may be upended and spend both time and energy in righting themselves. Some beach debris may have the potential to trap hatchlings and prevent them from successfully reaching the ocean. In addition, debris over the tops of nests may impede or prevent hatchling emergence (Hosier et al. 1981; NMFS & USFWS 2008). Please see the biological evaluation in appendix G for an analysis of impacts on critical habitat for loggerhead sea turtles.

Increased use of the island's beaches is anticipated to correlate with historically high visitation periods to the island, which in recent years has peaked from March through July and again in late fall (NPS 2019b). While loggerhead sea turtles nest on the island in greater numbers, all three sea turtle species that nest on the island have the potential to be present between March and September so the anticipated heaviest use of these areas would overlap with the sea turtle nesting season. The increased presence of people on the beaches used by nesting sea turtles would increase the potential for indirect impacts beyond what is currently experienced. Adult nesting females typically crawl out of the ocean to nest during the night. Additionally, nests normally hatch during night hours, with a portion hatching at dawn, and therefore the increased presence of people during the day would not directly impact hatchling turtles since the majority of visitor use on the beaches occurs during daylight hours. However, as documented in the National Marine Fisheries Service and US Fish and Wildlife Service Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*), Second Revision, overnight visitors who may choose to walk on the beaches at night using flashlights during the nesting season may deter nesting females from coming ashore or disorient hatchlings (NMFS & USFWS 2008). In addition, pedestrian traffic may compact sand over unmarked nests, although the effect of this compaction has not been determined and may be negligible (NMFS & USFWS 2008).

Threats to sea turtles also include vessel strikes. Georgia State Sea Turtle Program Coordinator, Mark Dodd of the Georgia Department of Natural Resources, emphasized that sea turtles are not limited to the ocean side of barrier islands. "They occur everywhere, not just in the ocean," Dodd said. "They're in the sounds, the estuaries, the tidal creeks" (GA DNR 2018). The increased ferry service would overlap sea turtle nesting season and the time when they may be present in the intercostal waters where the ferry travels. The risk of boat collisions would slightly increase for sea turtles in these waters during these months. However, implementation of best management guidelines for ferry operators and posting educational signage would help minimize this risk.

As mentioned above, impacts at South End Beach would be mitigated by the establishment of a visitor access and boat landing and anchoring area that would guide visitors away from an

established environmental protection zone on the western portion of South End Beach. The designation of South End Beach as a dog-free area would eliminate potential nest disturbance from dogs digging. The installation of signage at South End Beach and in other areas of the national seashore would provide information on sensitive species, including turtles, and inform visitors of do's and don'ts to protect them and their habitat. In addition, bicycle and e-bike use on the beach would be prohibited between sunset and sunrise between April 1 and October 30 (similar to driving permits). Together, these efforts would reduce disturbance to sea turtles and result in beneficial impacts when compared to current conditions.

The potential impacts on sea turtles would continue to be mitigated by the park's sea turtle monitoring program. Records would be kept to evaluate trends in human disturbance potentially related to implementation of the preferred alternative. Mitigation in the form of increased visitor education efforts and nest protection measures would help reduce pedestrian presence/disturbance around nest sites. Any unanticipated indirect impacts on nesting success would be recorded and adaptive management strategies would be implemented if necessary.

In addition, part of the proposed management actions includes implementing indicators and thresholds for management strategies. Park staff would monitor the number of people per viewshed on several beaches and take adaptive actions to manage the area within established thresholds and capacities (the capacity for Nightingale Beach [between Sea Camp Crossing and Dungeness Crossing] has been identified as 60 people at one time per one-third mile of beach 90% of the time). Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts on the sea turtles. Maintaining this low density use along key areas of the island's shorelines, would indirectly minimize the potential for sand compaction and heavy foot traffic. Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts on sea turtles.

Special Status Fish—

There is no proposed in-water construction and therefore no impacts on Atlantic or shortnose sturgeon habitat.

Under the proposed action, expanded ferry service would result in passenger ferries regularly traveling farther north in Cumberland Sound to Plum Creek and toward the Satilla River. As mentioned above, possible ferry service seasonal extensions would result in passenger ferries being present in a greater extent of the sound later in the season and later in the day. Atlantic and shortnose sturgeon have been documented in the St. Marys River, and Atlantic sturgeon have been documented in Cumberland Sound, both of which are along the route of the ferry service from St. Marys, Georgia.

The increased ferry service would overlap the confirmed spawning season for Atlantic sturgeon in Georgia (late summer and fall) and therefore, the risk of boat collisions would slightly increase for spawning sturgeon returning to the St. Marys River during these months resulting in a slight adverse impact. However, migrant Atlantic sturgeon individuals that are not spawning in any given year are least likely to be present in Cumberland Sound between June and November and therefore the increased risk during much of the high visitation season would be confined to the portion of the route in the St. Marys River (approximately 5 miles). Shortnose sturgeon spend most of their lives in the estuaries of the rivers where they hatch and as such, expanded ferry service from St. Marys would slightly increase the potential for vessel strikes between St. Marys and the Cumberland Sound.

Since Atlantic sturgeon are bottom feeders and shortnose sturgeon have a propensity toward river estuarine habitat, an increase in kayak/canoe activity in the vicinity of the island would not be anticipated to affect the fish.

Special Status Plants—

There are no proposed actions within the lawn-like areas at Dungeness Mansion or Plum Orchard and therefore no impacts on the velvet sandy woods sedge are anticipated.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above in the "Affected Environment" section. Special status species would continue to be affected by the noise and disturbance of ongoing and future development in the area and the use of motorized equipment (boats and vehicles) both on and around the island. Special status species on the island would continue to benefit from ongoing management activities including controlled burns, management of invasive species, management of feral hogs, and species monitoring programs. Under alternative 2, proposed actions would contribute slight adverse impacts and long-term beneficial impacts on ongoing cumulative impacts on special status species.

Conclusion. Under the no-action alternative, there would be no proposed changes to special status species on and in the waters around the island. Under alternative 2, expanded ferry service and motorized concession tours increase risks for vessel and/or vehicle collisions and disturbance to several special status species; however, this increase would be mitigated by additional education and educational signage around the docks and in areas where affected species are known to be present. General expanded ferry service to the island and additional access to various portions of beach along the eastern seashore may lead to an increased potential for the presence of people on beaches used by nesting and foraging shorebirds and sea turtles, and would increase disturbance to these species beyond what is currently experienced. Mitigation efforts and implementing indicators and thresholds for management strategies would help minimize this risk and could reduce disturbance to shorebirds that result in long-term beneficial impacts.

CHARACTER OF DESIGNATED AND POTENTIAL WILDERNESS

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

Cumberland Island National Seashore protects the largest designated wilderness area on an East Coast barrier island. The Cumberland Island Wilderness is in the northern half of the island and encompasses approximately 9,907 acres (see figure 4) that were legislatively designated in 1982 (Wilderness Connect 2019). An additional 10,710 acres are authorized as potential wilderness (see figure 4). In total, approximately 20,617 acres at the national seashore are managed to protect wilderness character, which represents approximately 56% of the upland and marsh within the seashore's boundary. The Cumberland Island wilderness legislation mandates that the national seashore's designated wilderness would be permanently preserved in its wilderness condition. The wilderness area includes most of the seashore north of Stafford Plantation, with the exception of the central and eastern portions of the High Point-Half Moon Bluff Historic District and the uplands on Little Cumberland Island. In 2004, legislation excluded three 25-ft-wide road corridors from the wilderness along the main road, Plum Orchard Spur, and North Cut Road. Congress directed that these corridors be maintained for continued vehicle use.

Keeping It Wild 2, An Updated Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System produced by the Department of Agriculture provides a tangible definition of wilderness character and identifies four qualities of wilderness character that apply uniquely to every wilderness: untrammeled, natural, undeveloped, and solitude or primitive and unconfined recreation. These qualities are based on the wilderness definition from the Wilderness Act (section 2(c)). In addition to these four qualities, a fifth quality—other features of value—was also identified in the Wilderness Act: a wilderness "may also contain ecological,

geological, or other features of scientific, educational, scenic or historical value" (Landres et al. 2012; Landres et al. 2015).

Natural quality centers on the idea that wilderness contains ecological systems that are substantially free from the effects of modern civilization. This quality is degraded by the intended or unintended effects of people on ecological systems inside wilderness. Visitor use on the island increases the dispersal of invasive species that outcompete native vegetation and reduce species diversity. This risk is minimized by ongoing management to control the spread of invasive species on the island.

Ongoing wilderness overnight camping results in some degradation of the natural quality of wilderness by introducing invasive plants into the wilderness and potential human disturbance to ecological systems, including compaction and trampling of vegetation in localized areas.

The *undeveloped quality* centers on the idea that wilderness is without permanent improvements or human occupation. This quality is degraded by the presence of structures and installations, as well as the use of motor vehicles, motorized equipment, and mechanical transport because these increase people's ability to occupy or modify the environment. Scientific instrumentation, roadbeds, and administrative structures on the island diminish the undeveloped quality of wilderness.

The *opportunities for solitude or primitive and unconfined recreation quality* focuses on the outstanding opportunities that exist in wilderness to experience solitude, remoteness, and primitive recreation free from the constraints of modern society. This quality is degraded by tangible attributes of the setting that reduce these opportunities such as visitor encounters, signs of modern civilization, recreation facilities, and management restriction on visitor behavior. The national seashore provides a variety of opportunities for visitors to find solitude. The noise and presence of other visitors, noise from overflights, vehicle traffic noise, presence and maintenance of trails and campsites, and use of mechanized tools for emergency procedures add an element of human control that degrades the character of this wilderness quality. During six designated hunting periods on the island, the wilderness area is closed to all but hunting license holders. These closures temporarily limit opportunities for nonhunting visitors to experience the *opportunities for solitude or primitive and unconfined recreation quality* of the wilderness portion of the park.

The ferry schedule and landing location(s) on the island influences the distance day-use visitors can travel before needing to return to catch the last ferry. As a result, access to wilderness areas of the national seashore are limited to physically able day-use visitors traveling by bike on the main road or visitors on foot who have overnight wilderness permits.

The proposed Camden Spaceport location is approximately 3.5 miles west of designated wilderness on Cumberland Island with a projected flight path that would cross to the north of the wilderness area. Noise levels during launches, landings, and static fire events would be high in the surrounding areas, including Cumberland Island. Although infrequent, these individual noise events would be audible from the wilderness areas on the island and are likely to affect the *opportunities for solitude or primitive and unconfined recreation quality* of this wilderness area. The final Spaceport Camden Environmental Impact Statement (2021) states that "Noise at Cumberland Island National Seashore would be of particular concern because of the expectation among visitors of a completely natural soundscape" (FAA 2021). The analysis states "while many variables would influence whether visitor expectations align with actual events, it is certain that nonnatural noises would be inconsistent with wilderness characteristics and would interfere with natural quiet." The National Park Service estimates, based on long-term measurements in parks as well as urban and rural areas across the country, that median sound levels in the area are between 36 and 38 dBA (FAA 2021). At the northern portion of the island, the closest residence to the proposed spaceport location, noise would be expected to disrupt normal speech (66 dBA) for less than 36 seconds during each noise event. In

cumulative total, over the course of a year, the area would be exposed to noise levels exceeding 66 dBA for about 9 minutes (FAA 2021).

Impacts on Character of Recommended Wilderness

Alternative 1, No-Action Alternative. Under the no-action alternative, impacts on character of recommended wilderness would remain the same as described in the affected environment. The current resource threats and impacts on character of recommended wilderness would continue to occur.

Alternative 2, NPS Preferred Alternative. Under the preferred alternative, the addition of two wilderness campsites (Sweetwater Lakes and Toonahowie) combined with the abandonment of the Yankee Paradise campsite would provide four wilderness campsite locations (Hickory Hill, Brickhill Bluff, Sweetwater Lakes, and Toonahowie). While there would be one additional campsite, the number of available permits would remain the same to allow up to 72 overnight wilderness visitors. This alternative would allow up to three parties of six people each at each of the four wilderness campsites (3 parties x 6 people x 4 sites = 72 campers). The use of these campsites would result in both slight adverse and beneficial impacts on the *natural quality* of wilderness. The repeated overnight human use, the potential human disturbance to ecological systems through compaction and vegetation trampling, and the increased risk for spread of invasives in these areas would add to ongoing or anticipated impacts from projects discussed above and contribute slight adverse impact on the *natural quality* of wilderness in these locations. However, expanding overnight use to four locations, reducing the number of parties at each site, and further dispersing these uses throughout the wilderness area would result in beneficial impacts on the *natural quality* of wilderness by reducing the footprint of impact and confining the areas exposed to the impacts associated with this use.

The addition of two new campsites and the continued use of and maintenance of trails, campsite clearings, and backcountry wells would continue to add an element of human control that would add to ongoing or anticipated impacts that degrade the *opportunities for solitude or primitive and unconfined recreation quality* of the designated wilderness.

During clearing of vegetation at Sweetwater Lakes campsites, the potential use of small, mechanized equipment would temporarily adversely impact the opportunities for visitors to experience the *opportunities for solitude or primitive and unconfined recreation quality*. The campsite at Toonahowie would be placed at the site of a reserved estate property that was removed in the fall of 2018. Because of this previous disturbance and the presence of an existing well, the need for additional clearing is anticipated to be minimal and impacts on the *natural quality* of wilderness are not anticipated in this location. Visitation to two new wilderness campsites would also put visitors in areas of the wilderness where they may not have previously explored.

The abandonment and restoration of the Yankee Paradise wilderness campsite would result in a beneficial impact on both the *natural quality* of wilderness and the *opportunities for solitude or primitive and unconfined recreation quality*. Abandonment of this campsite would be offset by the creation of two new wilderness campsites. Creation of these new campsites would provide additional recreational opportunities but would have a minor adverse effect on the *opportunities for solitude or primitive and unconfined recreation quality*.

Under the preferred alternative, the potential for an expanded ferry schedule and service to Plum Orchard and the use of Hunt Camp campground could extend the frequency and distance day-use visitors travel into wilderness by dropping them off closer to the wilderness portions of the national seashore and allowing for an extended day on the island. As a result, access to *opportunities for*

solitude or primitive and unconfined recreation quality of the wilderness in the national seashore would increase. It is anticipated that many day-use visitors taking the ferry to Plum Orchard would focus their visit on touring the Plum Orchard Mansion and taking short hikes on the wilderness trails in the immediate vicinity. As a result, the *opportunities for solitude or primitive and unconfined recreation quality* could be minimally impacted by a higher concentration of visitors in the vicinity of Plum Orchard. However, these impacts would not extend beyond this area. The addition of two new wilderness campsites, the abandonment of an existing campsite in wilderness, and a reduction in the number of parties allowed at each site would maintain the same number of allowable campers but would also increase their dispersal with slight benefits to the *opportunities for solitude or primitive and unconfined recreation quality*.

Implementation of monitoring indicators for encounter rates on trails in the wilderness area of the island to measure opportunities for solitude would allow NPS management to use adaptive management strategies if this opportunity were threatened. This would result in long-term beneficial impacts on the *opportunities for solitude or primitive and unconfined recreation quality* of wilderness character in the national seashore.

Under the NPS preferred alternative, impacts on each of the wilderness qualities would continue to be greatest along trails and in proximity to the four wilderness campsites and Plum Orchard since access to other parts of recommended wilderness is more difficult and time consuming. Given the dense vegetation that hinders off-trail access, the impacts would continue to be localized and minimal when compared to the overall amount of wilderness in the national seashore.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above in the "Affected Environment" section. The *undeveloped quality* of wilderness and *opportunities for solitude or primitive and unconfined recreation quality* of wilderness would continue to be affected by ongoing park management activities. Opportunities to experience the *solitude or primitive and unconfined recreation quality* of wilderness would continue to be affected by nearby development outside of the park and during six designated hunting seasons when the wilderness area of the park is closed to all but hunting license holders. The *natural quality* of wilderness would continue to be threatened by invasive species and benefit from management to control their spread. Under alternative 2, proposed actions would contribute slight short-term adverse impacts on the overall cumulative impacts on *undeveloped quality* of wilderness and *opportunities for solitude or primitive and unconfined recreation quality* of wilderness. The proposed actions would contribute long-term beneficial impacts on ongoing cumulative impacts on opportunities to experience the *solitude or primitive and unconfined recreation quality* and the *natural quality of wilderness*.

Conclusion. Under the no-action alternative, there would be no proposed changes to character of recommended wilderness. Under alternative 2, repeated overnight human use and potential human disturbance to ecological systems in recommended wilderness areas would contribute slight adverse impacts on the *natural quality* of wilderness in these locations. Reducing the number of parties at each site and dispersing these uses would result in beneficial impacts on the *natural quality* of wilderness by reducing the footprint of impact. New campsites, the temporary use of mechanized equipment, and continued use and maintenance of trails would add to ongoing impacts that degrade the *opportunities for solitude or primitive and unconfined recreation quality* of the designated wilderness. An increase in the dispersal of campers across additional sites would provide slight benefits to the *opportunities for solitude or primitive and unconfined recreation quality*.

VISITOR USE AND EXPERIENCE

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

An unparalleled ecosystem along the southern coast of Georgia, Cumberland Island National Seashore attracts visitors to experience its pristine beaches, unique flora and fauna, and diverse natural and cultural resources. The national seashore is a unique unit that grants visitors the ability to see 4,000 years of history preserved, experience unconfined solitude and recreation in a wilderness area, recreate on a pristine beach, and see endangered species such as loggerhead sea turtles. Much of the western section of the island encompasses marsh land, welcoming visitors who may travel from mainland Georgia via kayak. The southern portion, where visitors arrive via ferry, is the most heavily visited area of the park and includes natural and cultural resources in addition to trails and pristine beaches. For visitors looking for solitude, Cumberland Island offers a wilderness experience in a lush forest of maritime oak and saw palmetto.

Visitation Trends. Visitation rates for Cumberland Island National Seashore include visitors to the mainland visitor center in St. Marys, Georgia, in addition to visitors to the island. In 2010, the park achieved peak visitation when nearly 92,000 people visited the unit. Prior to 2007, the park had not received more than 50,000 visitors in one year. Following the spike in 2010, annual visitation stabilized to approximately 50,000 to 60,000 visitors (PUSO 2019). Figure 9 depicts the overall increasing trend in visitation to Cumberland Island from 1992 to 2019.

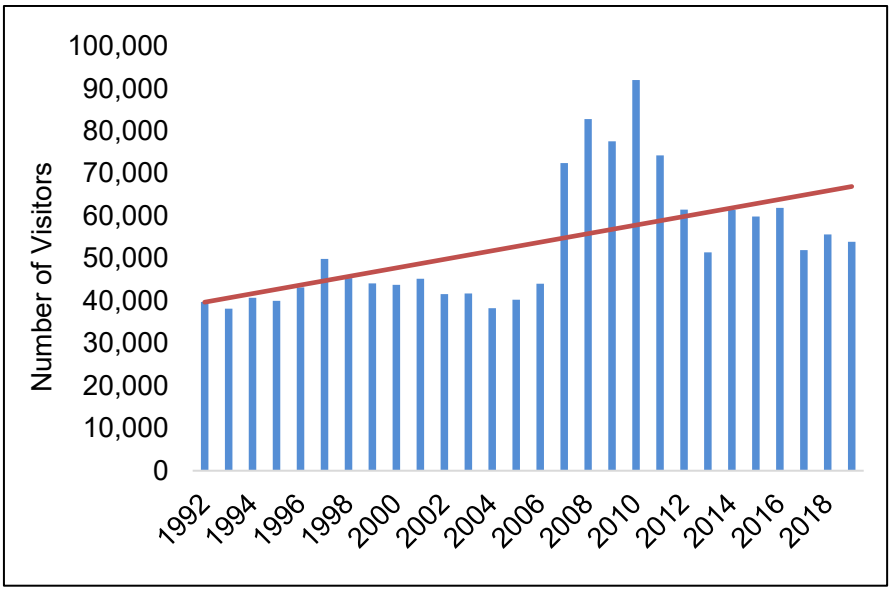


Figure 10. Annual Number of Visitors to Cumberland Island National Seashore with Visitation Trendline, 1992–2019

Visitation Trends. Visitation rates for Cumberland Island National Seashore include visitors to the mainland visitor center in St. Marys, Georgia, in addition to visitors to the island. In 2010, the park achieved peak visitation when nearly 92,000 people visited the unit. Prior to 2007, the park had not

received more than 50,000 visitors in one year. Following the spike in 2010, annual visitation stabilized to approximately 50,000 to 60,000 visitors (PUSO 2019). Figure 10 depicts the overall increasing trend in visitation to Cumberland Island from 1992 to 2019.

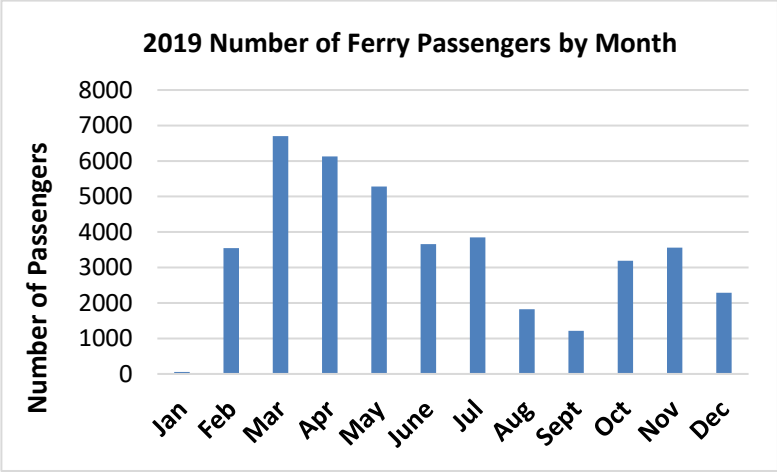


Figure 11. Number of Visitors to Cumberland Island Via Ferry Service by Month (2019)

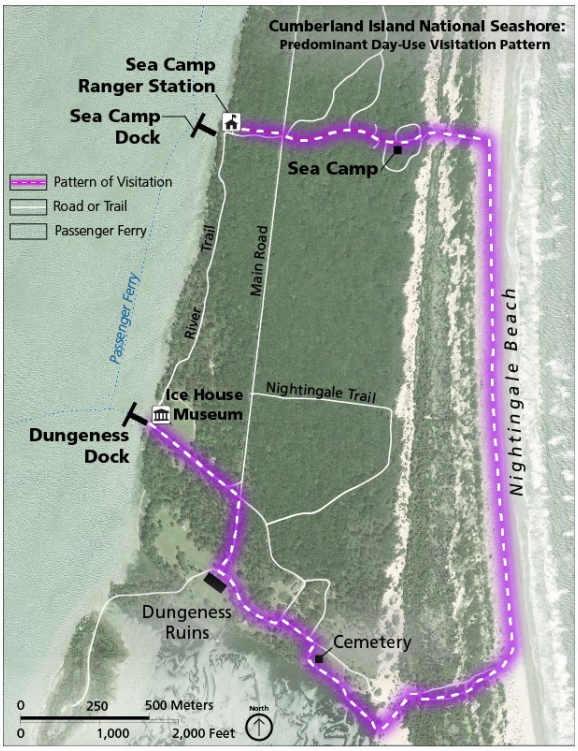


Figure 12. Visitation Pattern Between Dungeness Dock and Sea Camp Ranger Station

Ferry ridership accounts for a portion of total park visitation. The NPS Visitor Use Statistics site reported that the national seashore received nearly 54,000 visitors in 2019. However, the number of passengers that used the ferry in 2019 totaled 41,295. The difference between these two visitation measures is heightened during July, when park visitation is much greater than ferry ridership due to the park's participation in Independence Day events in the St. Marys community. Figure 11 illustrates the monthly number of passengers that accessed Cumberland Island via the ferry service in 2019. Note that January experienced negligible visitation due to the government shutdown that occurred for majority of the month. Most of the visitation to the park unit via ferry occurs between March and July of each year, but the overall warm climate of southern Georgia allows frequent visitation throughout the year, including winter months. As shown in figure 11, March/April and October/November display visitation sub-peaks, indicating that spring and fall are popular times to visit the park.

The majority of visitors traveled from Georgia and Florida with 41 other states being represented. Approximately 4% of visitors were international (NPS 2013 Visitor Use Study).

Note: January statistics are uncharacteristically low because of the federal government shutdown.

Research conducted between 2012 and 2018 suggested the average age of visitors to Cumberland Island is 50 years old. In addition, the typical group size was between two and four people. Visitation trends and access to the island remain constant, with minor fluctuations, due to the ferry delivery number established in the 1984 general management plan.

The development of two proposed local docks (the Gateway Dock and the Wharf at St. Marys) may increase visitation to the island as the town of St. Marys could potentially grow as a tourist destination. With added opportunities for private boaters, Cumberland Island may see an increase in private access visitation in addition to visitors being delivered via the ferry service.

In addition, the construction and operation of a Spaceport in Camden County may attract more visitors to the region. Although its construction is proposed north of St. Marys, the town will likely serve as the primary tourist destination and Cumberland Island may see an increase in visitation as a result.

Visitor Use Characteristics and Patterns. A study by Peterson, Brownlee and Sharp (2016) found that visitor use was most concentrated on the roads, trails, and beaches between Dungeness and Sea Camp. This information was consistent with findings from the 2013 NPS Visitor Use Study, which found that the most popular sites to visit included Dungeness Ruins and the associated beach. In addition, the 2016 visitation study ascertained that most visitors travel in a U-shaped pattern starting at Dungeness Dock—where they arrive on the ferry—then travel to Dungeness Ruins, walk east to the beach, and terminate their visit at Sea Camp Dock (see figure 12). This visitation pattern was consistent across all seasons.

Research suggests that most of the visitors were day-use only, spending between 4 and 8 hours on the island (NPS 2013). This is likely due to the ferry schedule, which heavily influences when day visitors can arrive at and depart from Cumberland Island. During the primary summer months, the ferry departs St. Marys twice per day and the island three times per day, with the last ferry leaving the island at 4:45 p.m.

The most popular activities that visitors engaged in were sightseeing (88%), wildlife viewing (81%), picnicking (62%), and ranger-led programs (45%). Regarding preferred activities for future visits, respondents indicated they would like to participate in wildlife viewing, sightseeing, picnicking, swimming, bicycling, and camping.

Only 15% of respondents from the 2013 NPS study participated in the Land and Legacies Tour, a legislatively mandated tour that transports visitors to historic sites throughout the island. The tours were operated by the National Park Service prior to 2016, and have been operated by a commercial service provider since that time. Primary reasons for not participating in the tour included tour is too long/they did not have time (25%), not interested (16%), and could not make a reservation (10%). Respondents provided other reasons for not taking the tour including, but not limited to, ferry schedule, planned for other activities, and took a different tour. However, 65% of respondents stated they would be interested in taking the tour in the future.

The park does not offer transportation for visitors to Plum Orchard—a cultural resource that highlights recreation, indulgence, and rejuvenation in nature during the 20th century—unless visitors participate in the Land and Legacies Tour. However, survey results from the 2013 NPS study indicated that 80% of respondents would be interested in taking the Plum Orchard Mansion tour if transportation was offered.

Current research suggests visitors experience "low to moderately low" levels of crowding at key destination sites (Brownlee et al. 2019). Current management and operations at the park may restrict a visitor's ability to explore the island due to the timing of ferry arrival and departure. Unless visitors stay overnight in the park, they have limited recreational opportunities once on the island due to timing constraints. The ferry drop-off locations are limited to Sea Camp Dock and Dungeness, which concentrates visitor use to two locations. Concentration of visitor use at key destinations has the potential to cause structural damage to cultural resources and may degrade natural resources through actions such as trampling or altering plant and/or animal habitats.

Visitor Experience. The majority of visitors to Cumberland Island access the park via a ferry service that departs from the NPS visitor center along the waterfront in St. Marys, Georgia. The ferry can accommodate 150 people per trip and departs St. Marys twice per day for a total of up to 300 ferry-based visits to the island per day. After a 45-minute ferry trip, the ferry drops passengers off at one of two primary locations: Dungeness Dock or Sea Camp Dock. Upon arrival to the island, visitors may engage in various recreational opportunities ranging from swimming to visiting cultural resources. However, day use visitors often have limited time for recreational opportunities on the island because of the current ferry schedule and the time it takes to access the island.

Biking. Visitors may bring their own bikes to the island on the ferry or may rent bikes from a concessioner on the island. The current ferry concessioner contract requires space for the transport of at least 10 personal bikes on each ferry. The current ferry operator offers space for a maximum of 15 personal bikes per ferry. In addition, visitors may rent one of the 24 bicycles available through the on-island rental operation. Approximately 15% of visitors to the park use bikes (Brownlee et al. 2019). There are no paved roads on the island, making biking more challenging and increasing travel times. In addition, bikes are not allowed on trails and may only be used on the 18 miles of administrative roads, parking areas, and on 1.5 miles of beach between Sea Camp and Dungeness. E-bikes are allowed in the park unit where traditional bicycles are allowed. Bicycles, including e-bikes and traditional bikes, are subject to the same 25 miles per hour speed limit as motor vehicles on the roads. Speed limits for biking on the beach are managed through Superintendent Compendiums and are currently set at the 25 miles per hour speed limit on the beach from August 1 through March 1 and 20 miles per hour from April 1 through July 31.

With the recent policy to allow e-bikes on administrative roads, visitors may be able to access more areas of the island than on a traditional bicycle or on foot, thus potentially improving the quality of visitor experience and visitor access. In addition, use of e-bikes on administrative roads and on portions of the beach may improve the overall quality of visitor experience because e-bike users may disperse farther north, decreasing the concentration of visitors in the Nightingale Beach area. While

there is potential for visitor use conflicts—particularly on the beaches—research indicates that once users were exposed to e-bikes, concerns about them decreased. The weight, cost, and battery life cycle of an e-bike may serve as barriers to visitors purchasing them and using them on the beach.

Hiking. The park offers more than 50 miles of hiking trails through maritime forests, wetlands, beaches, and historic districts. Due to the ferry location drop-off, many day-use visitors spend most of their time hiking in the southern portion of the island along trails such as the Nightingale Trail or the South End Loop. This use supports the U-shaped pattern of visitation density as described above. In addition, the northern portion of the park offers hiking trails through designated wilderness. Results from Brownlee et al. (2019) indicate that visitors to wilderness areas tend to travel on roads, trails, or the beach, likely due to dense vegetation on the island.

Kayaking/Boating. Aside from the ferry, visitors may access the island by taking a private boat and docking it at the north end of the Sea Camp dock on the western side of the island. The dock spaces are first-come, first-served, and are for day use only. At the southern end of the island along South Beach, private boaters may access the beach via the channel.

In addition to private boating, visitors may travel to the island by kayak from St. Marys, Georgia, Crooked River State Park, Georgia, or Amelia Island, Florida. Crooked River State Park is the most common launching point due to the strong current surrounding Cumberland Island. The tide surrounding the seashore may change between 6 to 9 feet per day, requiring kayakers to be familiar with the tide schedule to avoid getting stuck. For visitors who access the island by ferry, there are few opportunities for kayaking upon arrival.

Overnight Use. For visitors who elect to stay overnight, they can lodge at the privately owned Greyfield Inn or camp at one of the sites on the island. Sea Camp Campground, the only frontcountry camping site, offers 16 family sites (96 people) and 2 group sites (40 people) available for visitors and can accommodate a total of 136 people. In the backcountry, Stafford Beach Campground offers 6 sites that can accommodate 36 people. Lastly, visitors may choose to explore the northern portion of the island, which is predominantly designated wilderness. There are three designated campsites in wilderness that can accommodate 72 visitors in total.

Cultural Resources. Cumberland Island offers various cultural resources for visitors to discover the history of the island. The southern end of the island boasts the Dungeness Ruins and the Ice House Museum, while farther to the north visitors can explore the Plum Orchard Mansion or the First African Baptist Church. The Dungeness Ruins display the remnants of a Carnegie mansion from the late 1800s and is a highly visited attraction on the island. The Ice House Museum includes three primary exhibits: a historical timeline, the Carnegie family, and archeology on the island. Approximately 7 miles north of Sea Camp, the Plum Orchard Mansion remains intact and allows visitors a glimpse of Edwardian high society during the early 1900s. Farther to the north, the First African Baptist Church preserves some of the African American history of the island. However, access to some of these cultural sites, including Plum Orchard, is only available to visitors who are willing to hike, bike, or participate in the Land and Legacies Tour.

Tours. Visitors may explore the island on their own or participate in one of the tours offered through commercial services. The Land and Legacies Tour is a concessioner-provided interpretive tour that takes visitors to historic locations such as Plum Orchard Mansion, the Settlement, and Cumberland Island Wharf. Tours are offered on any days when the ferry is in operation.

Quality of Visitor Experience. Brownlee et al. (2019) conducted research on Cumberland Island to identify temporal and spatial visitor distribution, visitation frequency and density at popular attractions, and visitor thresholds for crowding at key destinations. Study findings indicated that

visitors experienced low levels of crowding at cultural sites, on the ferry and at the dock, at campgrounds, and at the beach. In addition, wilderness visitors expressed low levels of crowding while hiking trails or camping. Overall, visitors perceived crowding to be at a "low to moderately low" level on the island.

Impacts on Visitor Use and Experience

Alternative 1, No-Action Alternative. Under the no-action alternative, impacts on visitor use and experience would remain the same as described in the affected environment. The current resource threats and impacts on visitor use and experience would continue to occur.

Alternative 2, NPS Preferred Alternative. Under alternative 2, beneficial and adverse impacts are likely to occur to visitor access, use, and quality of visitor experience. The NPS preferred alternative proposes management strategies that aim to balance visitor use opportunities and resource protection at Cumberland Island National Seashore. Not all strategies would be implemented immediately, and some may be introduced in incremental phases or as determined necessary by monitoring. See appendix A for descriptions of monitoring indicators, thresholds, and associated management strategies.

Visitor access to Cumberland Island would be improved due to an expansion of visitor services offered through the concessioner. Under the preferred alternative, the passenger ferry service could be expanded to include more frequent trips or additional stops, such as to Plum Orchard. Impacts on natural or cultural resources from tour expansion would be mitigated by implementing strategies to manage within the identified visitor capacities included in appendix B. Visitors would likely experience beneficial impacts by having more flexibility to see the island and access different areas of the park unit. However, there may be short-term adverse impacts on visitor experience as visitors adapt to potential changes in the service.

Implementing and managing within visitor capacities at key attraction sites such as Dungeness Ruins, Nightingale Beach, Plum Orchard, and the Wilderness would provide beneficial impacts on resources and experiential conditions. Managing within capacities would eliminate the crowded conditions visitors sometimes experience on the island and generally maintain conditions acceptable to visitors.

Proposed management strategies may alter visitor use of the national seashore in various ways. Overall, bicycle use may increase as the maximum total number of bicycles allowed per day would increase to 100. The extension of bicycle use to the north between Dungeness and Stafford Beach would have beneficial impacts on visitor use and experience. Similar to the no-action alternative, the allowance of e-bikes may grant visitors the opportunity to experience more areas of the park in less time than on a traditional bicycle or on foot. Visitors seeking solitude may encounter more people and be more frequently disrupted by others if more visitors are able to access remote areas by bicycles or e-bikes. While more encounters may occur in some areas of the park, the number of encounters with e-bikes would be mitigated through the bicycle management strategy that limits the number of personal bikes transported on the ferry and rented through the on-island concession, which is described in Chapter 3: Alternatives.

In addition, use of e-bikes may have a beneficial impact on individual visitor's experiences and their physical health. Given the assistance that e-bikes provide, research indicates that e-bike users are likely to ride more often and for a longer duration than traditional bike users (Nielsen et al. 2019). They may allow visitors who would typically visit the island in a passive way participate in more active forms of recreation. While visitor safety and use conflict may be a concern, managing the number of bicycles is likely to mitigate such conflicts by limiting the total number of bicycles allowed

on the island each day and thereby managing the opportunity for such conflicts. Previous research (Nielsen et al. 2019) indicates that the majority of trail users are unaware of whether a bike is an e-bike or a traditional bike; therefore, the addition of e-bikes to traditional bike use is unlikely to cause any increase in visitor conflict on the beach. Given the natural environment, it is unlikely that e-bikes will be used extensively on the island because sand and salt may damage the relatively expensive motors.

Visitors will gain opportunities for overnight use with the addition of two wilderness campsites and one backcountry campsite, all of which will be managed through a permit system to ensure resource protection. Beneficial impacts result from providing certainty of access to visitors through a confirmed reservation. Increasing the number of campsites available may disperse overnight visitors, thereby improving the resource conditions along pristine beaches. Adverse impacts may occur in the short-term to visitors who aren't aware of the new reservation requirement and arrive at the park planning to camp but cannot because they do not have a permit. However, the proposed strategies increase the overall number of visitors who may be accommodated in wilderness and backcountry campsites from the current number of 36 campers to a maximum of 72 campers at one time. Additional visitor access to a diverse range of opportunities such as backcountry and frontcountry camping, more hiking trails, and commercial services would provide beneficial impacts on visitors. Kayak and/or canoe rental services may be offered for visitors, improving access to intercoastal areas and providing a broader range of recreational opportunities.

A new comfort station and pavilion at Nightingale Beach, and a new pavilion at Dungeness Beach, would provide beneficial impacts to visitors by providing shade and protection from weather while visiting the beach. The availability of health, safety, and essential camping supplies on the island would benefit visitors who travel to Cumberland Island without proper supplies.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above in the Affected Environment. Visitor experience could be affected by an increase in visitation to the local area from the development of two new local docks and the potential construction and operation of a spaceport. These impacts, in combination with the local long-term beneficial effects of alternative 2, would result in long-term moderate beneficial cumulative impact on visitor use and experience.

Conclusion. Under the no-action alternative, there would be no proposed changes to visitor experience. Under alternative 2, visitor access to Cumberland Island would be improved due to an expansion of visitor services offered and with the addition of facilities and supplies on the island. Implementing and managing visitor capacities at key attraction sites would provide beneficial impacts on resource and experiential conditions. Some proposed management strategies, including managing the number of bicycles and e-bikes on the island, may alter visitor use patterns and access, resulting in both beneficial and adverse effects depending on an individual's perspective.

SOCIOECONOMICS

Affected Environment (Current and Expected Future Conditions of Resources that Would be Affected)

Local Socioeconomics. St. Marys is a small historic town located along the St. Marys River. The city sits 7 miles west of the island and houses the visitor center for the park unit. Encompassing 16,000 acres, the city is known for its historic attributes, natural environments, and the Kings Bay Naval Submarine Base. Downtown St. Marys Historic District is listed on the National Historic Register and includes the NPS visitor center and waterfront where visitors depart for Cumberland Island.

Nearby mid-town is centrally located and consists of a shopping center, the Navy Submarine Base, and a commercial corridor. In addition to serving as the gateway community for Cumberland Island National Seashore, St. Marys residents have other recreational opportunities at the nearby Crooked River State Park. In 2019, the Georgia state park received more than 250,000 annual visitors.

In 2018, the population of St. Marys was 17,921 people, representing approximately one-third of Camden County's population of 52,714 (2018 ACS 5-Year Estimates Data Profiles). From 2000 to 2018, St. Marys' population increased by almost 30%; however, the majority of this growth occurred between 2000 and 2012. Camden County experienced nearly a 20% growth in population from 2000 to 2018, while the state of Georgia's population increased by approximately 27% during that same time period.

Visitor Spending and Economic Contributions. Visitation to Cumberland Island National Seashore is discussed above in "Visitor Use and Experience." The park's annual visitation rates are equivalent to the population of Camden County, demonstrating that the park plays an important role in the community. Ferry delivery numbers are consistent with the 1984 general management plan, thus having little to no impact on visitation trends, visitor spending, or the concession operator. In addition, the local community is familiar with the current ferry operating system and can navigate visitor use patterns and avoid congested areas on the mainland. The ferry service may serve as an economic barrier to some visitors, as it requires additional funds to purchase these tickets in addition to entrance fees at the park. Although ferry tickets may be purchased in-person in St. Marys, during the busy seasons the ferry may sell out and it is advantageous for visitors to book online. Therefore, access to the Internet is an additional barrier that may prevent low-income visitors from accessing Cumberland Island, inadvertently creating socioeconomic disparities in visitor demographics.

In 2018, visitors to Cumberland Island spent approximately $2.3 million, supported 33 jobs, $1.0 million in labor income, and generated $2.9 million in economic output. Since 2012, visitor spending on travel-related expenses such as hotels, restaurants, and transportation has ranged from $2 million/year to $2.6 million/year (figure 12).

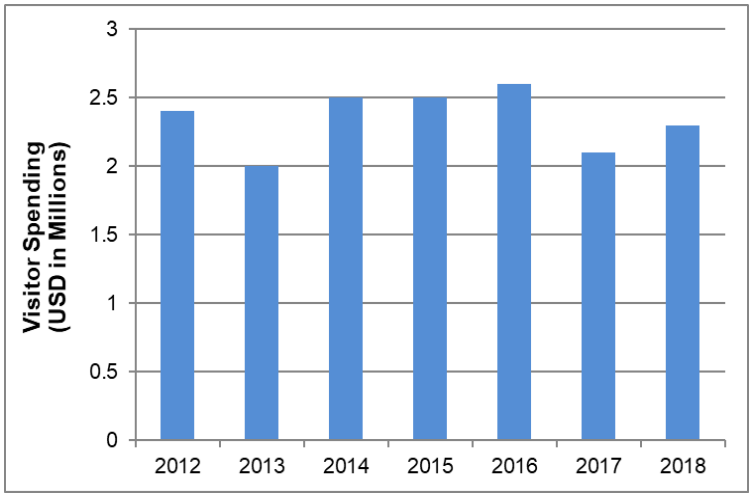


Figure 13. Cumberland Island Visitors' Annual Spending in Local Communities

Service-related business operators in St. Marys such as store owners, hotel owners, and restaurant owners benefit from visitor expenditures on Cumberland Island and in the local community.

Proposed development in St. Marys and Camden Spaceport may increase visitation to St. Marys and develop the town into a primary tourist destination. As a result, the town may need to develop additional accommodations such as lodging and dining that could provide economic benefit to the gateway community and local stakeholders. At the same time, this increase in development and potential growth of the area may lead to changes in local economics that could increase associated prices of traveling and the ferry prices. Consequently, the socioeconomic barriers to visitation may increase or remain the same.

Impacts on Socioeconomics

Alternative 1, No-Action Alternative. Under the no-action alternative, impacts on socioeconomics would remain the same as described in the affected environment. The current impacts on socioeconomics would continue to occur. The local community would not benefit from increased visitation and may experience a loss of economic contribution from people who were unable to purchase a ferry ticket due to the capacity established in the general management plan and therefore did not visit the park. Prices of the ferry service and the online reservation system may continue to inadvertently create socioeconomic barriers to visitation to Cumberland Island.

Alternative 2, NPS Preferred Alternative. The NPS preferred alternative includes management strategies that may incrementally increase park visitation by expanding the services offered through the ferry concessioner. An increase in ferry ridership may provide economic benefits to the concessioner and could provide more job opportunities to operate the services. There would be a potential gain in economic benefit to the concessioner from allowed sale of health, safety, and essential camping items on the island.

Changes to the ferry service may have varying impacts on socioeconomic barriers of visitation. An expansion of services may allow for more ticket sales, and therefore, could decrease the cost per ticket thus mitigating the socioeconomic barrier. In contrast, an incremental increase in visitors may require the concessioner to operate an additional vessel or hire more staff, thereby increasing the cost per ticket. There is potential for park management to work with the concessioner to provide discounted fees on particular days; however, that is not within scope of this planning effort. The future prospectus for the concessioner and associated operating plan would help identify potential options to mitigate socioeconomic barriers to visitation.

Visitor-related businesses in St. Marys such as retail, arts, entertainment, accommodation, and food services would likely experience beneficial impacts from increased visitation and visitor spending. Increased visitation may create a need for economic development such as more accommodation and dining services, thus potentially creating more jobs in the local community.

Cumulative Impacts. The impacts of past, present, and reasonably foreseeable planned actions are described above in the affected environment. The local socioeconomics of St. Marys would continue to benefit from visitation to Cumberland Island and associated park management activities. Socioeconomics could be indirectly impacted by changes to concessioner operations. These impacts, in combination with the minor beneficial impacts of alternative 2, would result in long-term minor beneficial cumulative impacts on socioeconomics.

Conclusion. Under the no-action alternative, there would be no proposed changes to socioeconomics. The local socioeconomics would continue to benefit from current visitation patterns, while the cost to purchase a ferry ticket may present an economic barrier to some visitors. Under alternative 2, local socioeconomics and the commercial service operator may benefit from an expansion of visitor services. The expansion of services may generate new jobs and lead to an incremental increase in visitation that could have long-term beneficial impacts on the local economy.

CHAPTER 5: CONSULTATION AND COORDINATION

US FISH AND WILDLIFE SERVICE, SECTION 7 CONSULTATION

Section 7(a)(2) of the Endangered Species Act requires each federal agency, in consultation with the Secretary of the Interior, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The National Park Service initiated informal consultation with the USFWS Coastal Georgia Ecological Services Field Office in September 2019 to discuss the plan and potential impact on federally listed species and their critical habitats. The most recent list of federally listed species was obtained from the USFWS IPaC website on August 1, 2019. Using this list, the park determined which of those species and their critical habitats had a potential to occur in the plan study area. Park staff met with representatives from the USFWS on-site on October 2, 2019, to discuss the proposed management plan and to seek input on those species with the potential to occur in the project area. Subsequent telephone conversations and meetings occurred between October 2019 and November 2019.

Upon release of this environmental assessment, letters and the biological evaluation of potential impacts on federally listed endangered, threatened, and candidate species known to or with potential to occur at Cumberland Island National Seashore were sent to the USFWS and the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). Known and potential species include the following: West Indian manatee (*Trichechus manatus*), piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), Eastern indigo snake (*Drymarchon corais couperi*), gopher tortoise (*Gopherus polyphemus*), Carolina gopher frog (*Lithobates capito*), green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempi*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*). Both sturgeon species fall under the jurisdiction of the NMFS. The letter requested that each agency confirm the species analyzed, review potential impacts, and concur with the determinations presented in the biological evaluation. The biological evaluation shared with other federal agencies is included as appendix G. These consultations are ongoing.

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

The Coastal Zone Management Act was enacted by Congress to balance the competing demands of growth and development with the need to protect coastal resources (16 USC 1451 et seq.). The Georgia Coastal Management Program was established in 1998 and is administered by the Department of Natural Resources, Coastal Resources Division.

As defined by the Coastal Zone Management Act, the actions subject to the enforceable polices of approved state management programs are any actions that (1) cause changes in the manner in which land, water, or other coastal zone natural resources are used, (2) cause limitations on the range of uses of coastal zone natural resources, or (3) cause changes in the quality or quantity of coastal zone natural resources. Georgia's coastal zone includes the project area. The National Park Service has prepared a Coastal Zone Management Act Consistency Determination (appendix I) for review and coordination with Georgia's Coastal Management Program (33 enforceable policies). Upon public release of this environmental assessment, the consistency determination and a copy of the assessment would be submitted to Georgia's Coastal Management Program for review.

FLOODPLAINS / WETLANDS STATEMENT OF FINDINGS

Executive Order 11988, "Floodplain Management" requires the National Park Service and other federal agencies to evaluate the likely impacts of actions in floodplains. The objective of Executive Order 11988 is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. NPS procedures for complying with the floodplain executive order are outlined in NPS Director's Order 77-2: Floodplain Management and Procedural Manual 77-2 (Director's Orders 77-2 and PM 77-1, respectively).

Executive Order 11990, "Protection of Wetlands" requires the National Park Service and other federal agencies "to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." NPS procedures for complying with the wetland executive order are outline in Director's Order 1-77-1 and Procedural Manual 77-1 (Director's Order 77-1 and PM 77-1, respectively).

In accordance with Executive Orders 11988 and 11990, and NPS guidelines for implementing the orders, the National Park Service has reviewed the flood hazards for proposed actions that fall within the designated floodplain on Cumberland Island and has prepared a Floodplain and Wetland Statement of Findings in compliance with these NPS management procedures. The statement of findings can be found in appendix H.

GEORGIA HISTORIC PRESERVATION DIVISION AND AFFILIATED TRIBES, SECTION 106 CONSULTATION

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (54 USC 306108) to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. Under the terms of the 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance, "all undertakings that do not qualify for streamlined review will be reviewed in accordance with 36 CFR Part 800."

Because of the comprehensive nature of the visitor use management plan and the extended potential timeline for implementation, details related to the exact location, design, and necessary construction activities for all associated actions that may affect historic properties have not been determined. This level of detail is necessary to properly assess the potential effects on historic properties through the section 106 process and to identify additional mitigation measures to best preserve the historic character of the cultural resources found in the park. Since the National Park Service cannot yet assess the specific effects of individual projects on historic properties carried out as the selected alternative is implemented, Cumberland Island National Seashore commits to continuing to consult with the Georgia Historic Preservation Division, traditionally associated tribes, and other consulting parties, as necessary, and completing section 106 compliance for individual actions as they are pursued. This requires that the park continue to perform identification and evaluation of potential historic properties in designated areas of potential effect, in accordance with section 106 regulations (54 USC 306108). Undertakings will be evaluated for their effects findings and every effort would be made to avoid, minimize, or mitigate any activity that is found to have an adverse effect on a historic property.

Indicators and thresholds that have been identified by this current assessment would support the park's efforts to avoid and minimize effects to the park's cultural resources. Monitoring cultural

resources by cultural resource staff and volunteer supporters would help preservation specialists provide treatments to historic properties and the surrounding cultural landscapes. This monitoring and treatment process is ongoing, with this plan supporting future section 106 compliance actions that would complete independent review of a project area, as well as provide information for future section 110 identification and evaluation of cultural resources.

Future undertakings that would result in other activities that may have an effect on historic properties would be reviewed under the section 106 process. For section 106 reviews, Cumberland Island National Seashore's consulting parties include the Georgia Historic Preservation Division, the traditionally associated tribal organizations, and other local and regional partners interested in providing comment.

Based on the described plan, the park has taken into consideration those routine actions and resource management activities that would have an effect on historic properties in Cumberland Island National Seashore. The National Park Service recommends the proposed plan to result in no adverse effects on historic properties.

PREPARERS AND CONSULTANTS

Cumberland Island National Seashore

Jared Brewer, Chief Ranger
Carl David, Facility Manager
John Fry, Chief, Resource Management (former)
Chad Gray, Administrative Officer
Jill Hamilton-Anderson, Chief, Interpretation (former)
Doug Hoffman, Wildlife Biologist
Gary Ingram, Superintendent
Kara Roll, Management Support Specialist
Nick Roll, Ranger
Michael Seibert, Chief, Resource Management

South Atlantic Gulf Region 2

Rachel Brady-Baldwin, Outdoor Recreation Planner
Mark Kinzer, Planning and Compliance
Ben West, Program Manager, Planning and Compliance Division
Amy Wirsching, Community Planner

NPS Denver Service Center

Sarah Bodo, Project Manager
Rachel Collins, Visitor Use Management Specialist
Kelly Horvath, Visitor Use Management and Socioeconomic Specialist
Wanda Gray Lafferty, Contract Editor
Beth Malone, Visual Information Specialist (former)
Alexa Miles, Natural Resource Specialist
Tara Pettit, Project Manager (former)
Hilary Retseck, Cultural Resource Specialist
Andrew White, Visitor Use Management Specialist
Rafael "Zak" Wood, Geographic Information Specialist

This page intentionally left blank.

APPENDIXES

This page intentionally left blank.

APPENDIX A: INDICATORS AND THRESHOLDS

INTRODUCTION

The visitor use management framework created by the Interagency Visitor Use Management Council (IVUMC) includes a series of elements by which planning decisions are made concerning visitor use management. Establishing indicators and thresholds and identifying visitor capacity are key components of this framework as applied by the NPS. Indicators measure conditions that are related to visitor use, and monitoring is conducted to track those conditions over time. Potential management strategies are described for each indicator and would be applied together with the actions of the preferred alternative presented in this plan. This iterative practice of monitoring, implementing corrective strategies, and then continuing to monitor to gauge the effectiveness of those actions allows park managers to maximize benefits for visitors while achieving and maintaining desired conditions for resources and visitor experiences in a dynamic setting. In this section, the indicators to be monitored at Cumberland Island are presented, and the associated thresholds and strategies are used to inform ongoing visitor use management.

Indicators translate the broad description of desired conditions into measurable attributes (e.g., number of people per viewshed) that can be tracked over time to evaluate change in resources or conditions that relate to visitor experience. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described in this section are considered the most noteworthy, given the importance and vulnerability of the resources or visitor experiences affected by visitor use. In identifying meaningful indicators, the planning team also reviewed the experiences of other park units with similar issues. Indicators are applied to the preferred alternative within the plan. Thresholds that represent the minimum acceptable condition for each indicator were then assigned, taking into consideration the qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, and staff management experience. Although defined as "minimally acceptable," thresholds still represent acceptable conditions. Also, establishing thresholds does not imply that no action would be taken prior to reaching the threshold. One goal of visitor use management is to strive to make progress toward desired conditions. Thresholds identify when conditions are about to become unacceptable and accordingly serve as a "line in the sand," letting managers and the public know that corrective action must be taken to keep conditions acceptable so that progress toward desired conditions can be achieved over time. For one indicator, a trigger has been developed. A trigger reflects a condition of enough concern for an indicator to prompt a management response to ensure that desired conditions continue to be maintained before the threshold is crossed (see figure A-1).

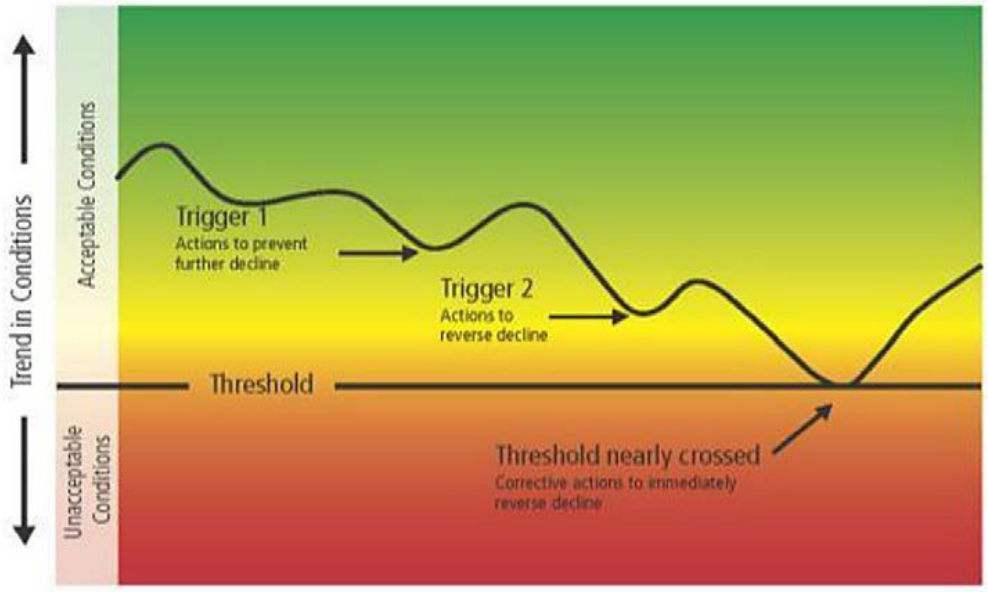


FIGURE A-1. MANAGEMENT TRIGGERS AND THRESHOLDS IN RELATION TO TREND IN CONDITIONS

Potential management strategies identified below represent the range of actions in addition to those found within the preferred alternative that the NPS may take to meet the goals and desired conditions of this plan. If it is determined through monitoring that thresholds are being approached or exceeded, the NPS would employ one or more of these management strategies. The potential impacts of these actions are analyzed in chapter 4 of this plan. Some management strategies are currently in use at the park and may be increased in response to changing conditions. If additional strategies are needed as outlined in the potential management strategies, details of their application would be developed as thresholds are exceeded or approached and would be informed by monitoring results.

Visitor use management is an iterative process in which management decisions are continuously informed and improved through monitoring to determine the most effective way to manage visitor use to attain desired visitor experience and resource conditions. As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and experiential conditions. Information on NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and thresholds would be available to the public. To ensure resources and visitor experiences are protected, a monitoring program and field protocols for tracking these indicators will be developed subsequent to this plan and prior to other management actions (such as increasing daily ferry delivery numbers or making changes to backcountry camping permit availability). Having the monitoring program and protocols in place will ensure park managers have a mechanism for understanding changes before they are likely to occur.

While triggers and thresholds would not be changed or altered merely because they are not being achieved, new information and research could inform an update to identified triggers and thresholds. Specifically, this new information would need to improve park managers' quantitative understanding of how desired conditions are represented on the island.

Indicator: Number of people entering posted closures (temporary or permanent) of sensitive shorebird areas.

Threshold
No more than two consecutive monitoring periods with a report of people entering a posted closure or a report of visitor-related disturbance in a posted closure.

Rationale for Indicator and Threshold

This indicator addresses issues of disturbances from visitors and their pets, which can pose a threat to shorebirds, some of which are protected under the Endangered Species Act and the Migratory Bird Treaty Act. Human disturbance can cause shorebirds to spend less time roosting or foraging and more time in alert postures or fleeing from the disturbances. Shorebirds that are repeatedly flushed in response to disturbance expend energy on costly short flights. Shorebirds such as Wilson plovers, American oystercatchers, Willets, and least terns can be found nesting on Cumberland Island. Areas of the island are designated critical habitat for the piping plovers.

This indicator will help minimize human disturbance and protect sensitive bird species nesting at the seashore. The threshold will also help protect resources by monitoring disturbances at posted closures.

Potential Management Strategies

- Identify and protect shorebird nesting and staging habitat with "Area Closed" signs and fencing to provide a 100-meter buffer between the birds and human disturbance.
- Educate people on the buffer zone and the importance of protecting sensitive and threatened species. Develop and implement a public information effort about the desired conditions for the park and actions the National Park Service is taking to achieve those conditions and how visitors can help. This information could be distributed through direct visitor contact, park publications, wayside exhibits, social media, websites, and through park partners.
- Implement and enforce prohibition on pets (dogs, cats, and other pets) on South End beach. Where pets are allowed, implement and enforce a regulation that all pets must be on a leash not to exceed 6 feet in length.
- Increase law enforcement patrols and possibly partner with other law enforcement agencies to educate and enforce closures and prohibitions as staffing resources allow.
- Directly manage visitor access to targeted areas (i.e., away from known shorebird nesting areas or areas known to be important in past years for resting and foraging shorebirds, detouring visitors around nesting areas).
- Implement and enforce designated boat landing areas or boat landing closures as necessary to protect nesting shorebirds.
- Continue to prohibit and enforce aerial recreation activities (unmanned aircraft, ultralights, hang gliding, paragliding, and parasailing) that could negatively impact shorebirds.
- If necessary, consider a full closure of the South End Beach area to protect sensitive shorebirds if posted closure areas are not effective.

Monitoring Strategies

Monitoring of human disturbance on nesting shorebirds can coincide with ongoing shorebird surveys. Utilizing monitoring strategies recommended by the NPS, other agencies, and the Atlantic Flyway Shorebird Initiative, the park would develop a monitoring plan that would identify the location, frequency, and necessary information to be collected. The park may request assistance in monitoring this indicator from volunteers or other local agencies.

Indicator: Number of People Per Viewshed at Nightingale Beach

Threshold
No more than 23 PPV 90% of the time.

Trigger
20 PPV is reported, 90% of the time.

Rationale for Indicator, Trigger, and Threshold
The uncrowded setting of the island is unique and important because it allows visitors to have diverse recreational opportunities. The absence of crowds and development provides opportunities for solitude and exploration. The Desired Conditions for visitor experience in the Natural Environment Zone, which includes Nightingale Beach, state that "opportunities for low-density experiences are provided in the natural environment zone" and that "visitors have the opportunity to experience pristine and expansive stretches of beach and to understand the significance of this resource."

This indicator monitors the quality of the visitor experience, and the degree to which desired conditions are achieved, by comparing observed conditions with visitor preferences for the number of people within view at Nightingale Beach. For purposes of this indicator, the number of people per viewshed is defined as the number of people one would perceive if they stand on the beach looking parallel to the shoreline (i.e. north or south). Generally, people perceive others if they are within 1/3 mile in this environment. In 2010 and 2011, researchers from Clemson University and Vermont University gathered information on visitors' preferred conditions, minimal acceptable condition, the point at which they believe management action should take place (management action required), and the point at which they might not return to the site because of conditions (displacement) (Hallo et al, 2012). In 2018 and 2019, researchers from Clemson and Kansas State conducted a similar study (Brownlee et al, 2019). These studies involved the use of photo simulations of a viewshed. The social norm curves that reflect the visitor perceptions and preferences from these studies are reflected in figure A-2.

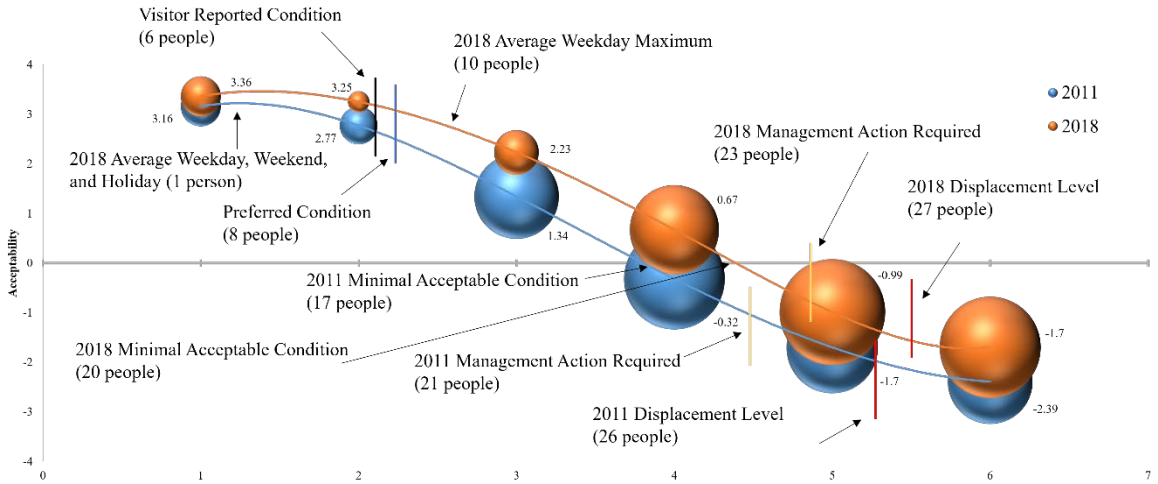


Figure A-2. Social Norm Curves from 2011 (Hallo et al., 2012) and 2018 (Brownlee et al., 2019) Studies. The regression curves show decreasing visitor acceptability of conditions as people per viewscape increases. The relative size of the bubbles represents agreement or consensus regarding the acceptability of conditions, which was moderate overall. (Image Credit: Brownlee et al. 2019).

Park managers considered the two studies and elected to base trigger and threshold identification on the 2019 study. The two social norm curves show that 2019 visitors have higher tolerances for people per viewscape than 2012 visitors. This indicates that visitor tolerances for crowding at Nightingale Beach have marginally increased over time. As the more recent study is likely more reflective of current visitor attitudes and preferences, park managers elected to rely on it.

Park managers then considered the various points along the 2019 social norm curve. As 20 People Per Viewscape represents the point at which conditions become unacceptable for the average visitor, park managers elected to identify a trigger at that point. The trigger was established to ensure that desired conditions continue to be maintained before the threshold is crossed. As 23 People Per Viewscape represents the point at which the average visitor believes management action should be taken to address crowding, park managers elected to identify the threshold at that point. While thresholds are defined as minimally acceptable conditions, they are also the point at which managers take action to address conditions. Therefore this threshold represents the level at which both park managers and visitors think action should be taken to improve conditions.

Park managers also considered current use levels when establishing the trigger and threshold. According to the 2019 data, at peak times of the day on the typical busy day (90th percentile day), there are about 10 people per viewscape at Nightingale Beach (Brownlee et al, 2019). This means the trigger and threshold allow for an approximate doubling of People Per Viewscape from the levels observed during the 2019 study (see figure A-3).

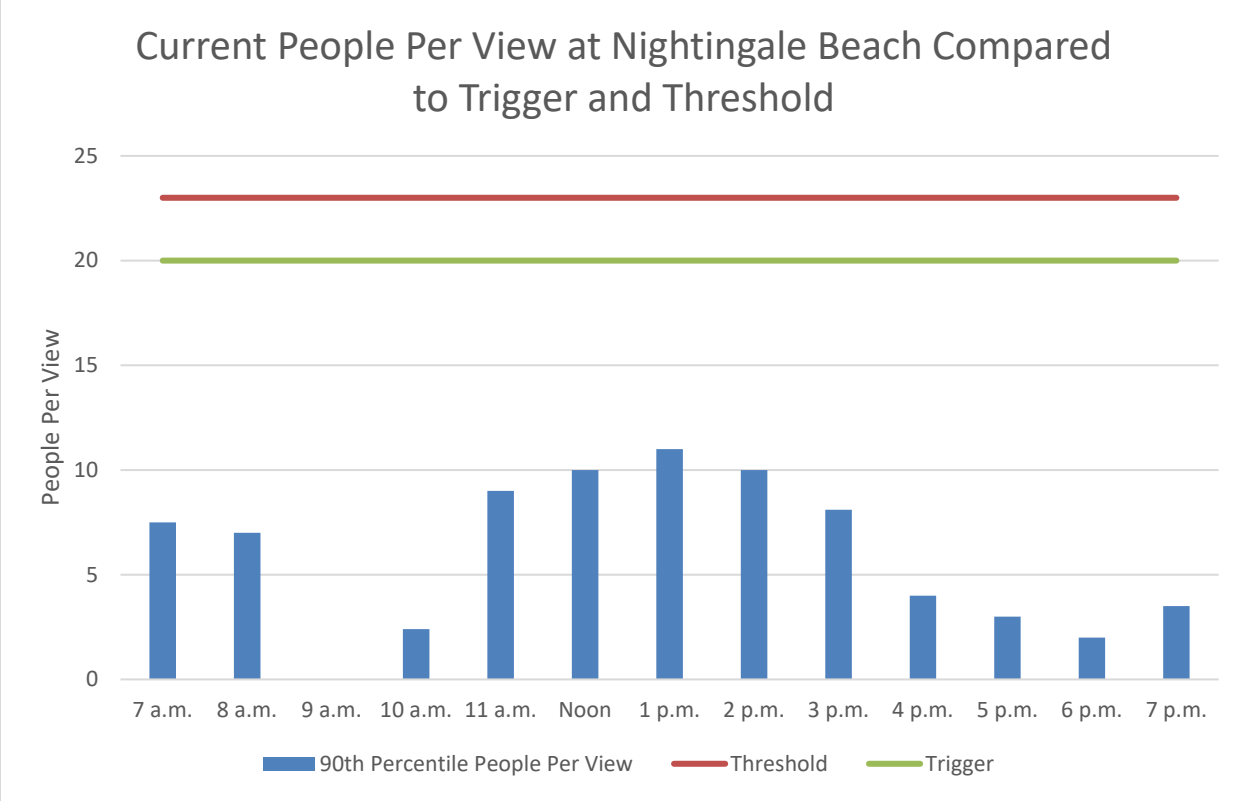


Figure A-3. Current People Per View at Nightingale Beach Compared to Trigger and Threshold. Note that the current people per view at Nightingale Beach was calculated using only observations when at least one person was present. This mimics the Monitoring Strategy described below. (Data Source: Brownlee et al. 2019)

Potential Management Strategies Upon Reaching Trigger

Nightingale Beach is monitored to assess the magnitude of the trend. Management actions that center on providing information to visitors in order to influence visitation levels and patterns would be taken as additional monitoring is conducted. The intent of these actions would be to keep PPV levels from exceeding the threshold.

Potential Management Strategies Upon Reaching Threshold

- Develop and implement a public information effort about the desired conditions for the park and actions the NPS is taking to achieve those conditions and how visitors can best experience the park. This information could be distributed through direct visitor contact, park publications, wayside exhibits, social media, websites, and through park partners.
- Increase the development and distribution of information pertaining to the unique attributes of other areas of the island.
- Encourage visitors to visit these sites earlier or later in the day to avoid periods of peak use.
- Set a maximum group size.
- Alter ferry delivery times, locations, and sizes to distribute visitors more widely across the park during peak periods of the day to lessen the number of PPV at Nightingale Beach.

Monitoring Strategy

The park will conduct an annual review of data collected from monitoring efforts (which may include trail counter or camera data, or observations by park staff or volunteers). During this annual data review, park staff will determine if the threshold or trigger is being approached or exceeded. For purposes of calculating a percentage of time thresholds are exceeded, only observations between 11:00 a.m. to 3:00 p.m. would be considered. This period of the day generally captures peak visitation (Brownlee et al, 2019). Observations that do not include any people within view will not be considered in these calculations regardless of time of day. This will ensure the percentage is not underestimated.

The 90% of the time tolerance means that the occasional surges or spikes of visitors that occur would not automatically mean that the threshold has been exceeded. For example, if there are 100 observations during an annual review, and 10 or fewer of those observations include more than 23 people, the threshold would not have been exceeded. The 90% of the time tolerance also means that the threshold and trigger would be reached when the typical busy day (90th percentile day) reaches thresholds and triggers, not when the absolute busiest day reaches those benchmarks.

Indicator: Number of people encountered on trails per day in designated wilderness

Threshold

90% of visitors will encounter no more than 4 groups (of 6 people or fewer) on trails in designated wilderness per day.

Rationale for Indicator and Threshold

The park protects the largest designated wilderness area on an East Coast barrier island. Wilderness provides opportunities for low-density experiences consistent with wilderness values. Visitors have the opportunity to experience solitude, remoteness, risk, challenge, and self-sufficiency. This indicator measures the number of groups that visitors encounter as they travel through the

wilderness area of the island. This indicator is related to crowding. Encounter rates are a primary means by which opportunities for solitude would be measured on trails in the wilderness area of the island.

Potential Management Strategies

- Develop and implement a public information effort about the desired conditions for the park and actions the National Park Service is taking to achieve those conditions and how visitors can best experience the park. This information could be distributed through direct visitor contact, park publications, wayside exhibits, social media, websites, and through park partners.
- Ensure that informational materials that cover a wide variety of topics such as park rules and regulations, Leave No Trace practices, and wilderness stewardship are available to visitors in a variety of ways.
- Enforce NPS rules related to group size of 6 or fewer people and obtaining permits for camping within the wilderness.
- Encourage visitors to start their hikes earlier or later in the day, or during off-peak times of the year to avoid periods of peak use on high-use trail sections.
- Encourage visitors to explore a diversity of trails.
- Issue day-use permits to hike in wilderness
- Alter ferry delivery times and locations to encourage day visitors to spend their time touring Plum Orchard mansion and grounds instead of hiking in wilderness

Monitoring strategies

The park will conduct an annual review of data collected from monitoring efforts (which may include trail counter or camera data, or observations by park staff or volunteers). During this annual data review, park staff will determine if the threshold is being approached or exceeded. If trail counters are used, NPS staff will periodically conduct direct observation counts of encounters to see if the relationship between automated count totals and encounter rates remains the same or needs to be adjusted.

This page intentionally left blank.

APPENDIX B: VISITOR CAPACITY ANALYSIS

INTRODUCTION

This appendix to the Cumberland Island National Seashore Visitor Use Management Plan identifies visitor capacities for key destinations on the island. The visitor capacities are identified based on the principles described in the Interagency Visitor Use Management Council's (IVUMC's) "Visitor Use Management Framework" and "Visitor Capacity Guidebook." These documents and associated background material are available on the IVUMC's website at: http://visitorusemanagement.nps.gov/.

The IVUMC defines visitor capacity as the maximum amounts and types of visitor use that an area can accommodate while achieving and maintaining the desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established. By identifying visitor capacities and managing the amounts and types of use within those capacities, the National Park Service can ensure that resources are protected and that visitors have opportunities for high-quality experiences. Identifying visitor capacities is also directed by the National Parks and Recreation Act of 1978, which requires the National Park Service to identify and implement commitments for visitor capacities for all areas of a park unit.

Visitor capacities are management decisions based on the best available science and other factors, including professional judgment, staff experience and expertise, lessons learned, and public input. Visitor capacity identifications, like other management decisions, provide management direction, but are not intended to be permanently binding. The visitor capacities could be adjusted in the future based on desired conditions being maintained or new information becoming available through further study, analysis, and monitoring that necessitates a reevaluation of the visitor capacities. Any change in the visitor capacities would be done after rigorous analysis and with strong rationale. Part of this analysis would include identification of the probable cause of the issues or changes necessitating the revised visitor capacities. The rationale for the adjustments would be documented including:

- A summary of the original visitor capacity and how it was implemented,
- Analysis of the monitoring data that suggests the need for an adjustment,
- Reasoning for the selection of the new visitor capacity, including analysis/evidence from which decisions were based,
- What will change, how it will change, and resources needed to make the change, and
- How the visitor capacity adjustment will maintain desired conditions.

If visitor capacities are adjusted, environmental compliance and civic engagement or public notification would be conducted in an appropriate manner given the anticipated impacts of the change.

For background, it is important to note that the 1984 General Management Plan (GMP) stated that about 300 people will visit the island each day. The GMP goes on to say:

> *The present visitation ceiling of approximately 300 people a day will continue until such time as resource and visitor use monitoring indicates that reevaluation of visitor levels is appropriate.*

Since the GMP was developed in 1984, the best practices for identifying visitor capacities have evolved and been refined. Based on the IVUMC's guidance on current best practices, identification of an island-wide capacity as was done in the General Management Plan is not as helpful since managing to an overall number would not necessarily ensure that desired conditions are achieved and maintained at specific locations on the island. For example, if an island-wide visitor capacity were identified and managed to, but the vast majority of those daily visitors spent their day on one small stretch of beach, visitation would likely cause undesirable impacts to the resources and visitor experience at that location. By identifying capacities for each analysis area, park managers can link their actions more closely with the way visitors experience the island.

In addition, while the number 300 has been referred to in the GMP and elsewhere as a "carrying capacity," in practice that number has been used as the commercial ferry's daily delivery number. In other words, while the 300 number may have been commonly referred to as a "capacity," it has in fact been the maximum number of people delivered to the island by ferry on a daily basis. This is not a true visitor capacity since it does not account for visitors arriving to the island by alternative means (i.e., private boats), nor does it account for accumulation (e.g. visitors who arrive by ferry on a Thursday, camp on the island, and return to the mainland on a Sunday). When accumulation, alternative means of arrival, and daily ferry arrivals are taken together, it can be safely said that current management is for an island-wide capacity of some undefined number greater than 300.

Therefore, the planning team determined that this plan will update the island's visitor capacity on an analysis area-based approach according to IVUMC guidance. Identification of the number of visitors that will be delivered to the island by ferry will be based on these analysis area capacities. For a complete discussion of how ferry delivery will be managed within identified visitor capacities in this plan, see appendix C.

Visitor capacities were identified using best practices and examples from other plans and projects across the National Park Service. The process for identifying capacity follows four guidelines: 1) determine the analysis area, 2) reviewing existing direction and knowledge, 3) identifying the limiting attribute, and 4) identifying visitor capacity.

The primary goal of this VUM plan is to preserve the fundamental resources and values of Cumberland Island. The amount, timing, distribution, and types of visitor use on Cumberland Island influence both conditions of fundamental resources and visitor experiences. By identifying and managing the maximum amounts and types of visitor use that areas on the island can accommodate, the National Park Service can help ensure that resources are protected and that visitors have the opportunity for a range of high-quality experiences. Visitors have noted that they are currently having high quality experiences with the generally low-density levels of use found on the island. However, visitors have expressed some concerns regarding the sufficiency of ferry-based access to the island, alternative non-ferry-based access to the island, impacts to sensitive resources, and the diversity and quality of recreational experiences on the island.

Determine the Analysis Areas

Following the IVUMC guidance on visitor capacity, it is necessary to break up a complex area like Cumberland Island into distinct geographical segments, or analysis areas, to effectively analyze appropriate levels of use. These analysis areas are defined by natural geographic boundaries, visitor use patterns, and the spectrum of desired conditions that occur on the island. The analysis areas for Cumberland Island can be categorized into two groups—destinations where levels of visitor use may cause impacts and threaten desired conditions, and locations where this is not currently the case and is unlikely to occur. For the former grouping, referred to in this section as "key locations," a detailed analysis has been conducted to identify the appropriate level of use. The sites listed below were identified by the planning team as the key locations requiring this more detailed analysis:

- **Nightingale Beach**-segment of beach between Sea Camp Crossing and Dungeness Crossing
- **Stafford-Greyfield Beach**-segment of beach between Sea Camp Crossing and the southern Wilderness boundary, analyzed together with Jetty Beach
- **Jetty Beach**-segment of beach between Dungeness Crossing and the Jetty, analyzed together with Stafford-Greyfield Beach
- **North Beach**-segment of beach that stretches from the southern Wilderness boundary north to Long Point
- **South End Beach**-segment of beach that begins south of the Jetty and extends around the southern tip of the island toward the South End Ponds
- **Dungeness Ruins**-includes the Dungeness Ruins, surrounding grounds, and associated support structures
- **Plum Orchard**-includes the Plum Orchard mansion, surrounding grounds, and associated support structures
- **Settlement**-includes the First African Baptist Church and other houses built by the descendants of freed slaves
- **Wilderness**-includes 9,907 acres of designated wilderness and 10,710 acres of potential wilderness.

Other locations on the island, referred to in this section as "other locations," were analyzed more briefly in a table (see Table B-2). This approach is consistent with IVUMC guidance in that the level of analysis that occurs during visitor use management planning and visitor capacity identification is determined on a sliding scale depending on the complexity and context. Since the desired conditions for these "other locations" are currently being achieved with current use levels, the visitor capacities at these locations have generally been identified to be near, at, or slightly above current use levels.

For all analysis areas, both key locations and other locations, future monitoring of use levels and indicators will inform the National Park Service if use levels are nearing visitor capacities. If capacities are approached, management strategies as outlined in appendix A, appendix B, appendix C, and chapter 3 of this plan will be taken. Should the "other locations" begin to receive levels of visitor use that threaten desired conditions, the more detailed analyses completed for the "key locations" would serve as a guide for a more detailed capacity analysis of the "other locations." Together, the key locations and other locations comprise nearly all of the visitor use areas within Cumberland Island National Seashore (see figure B-1).

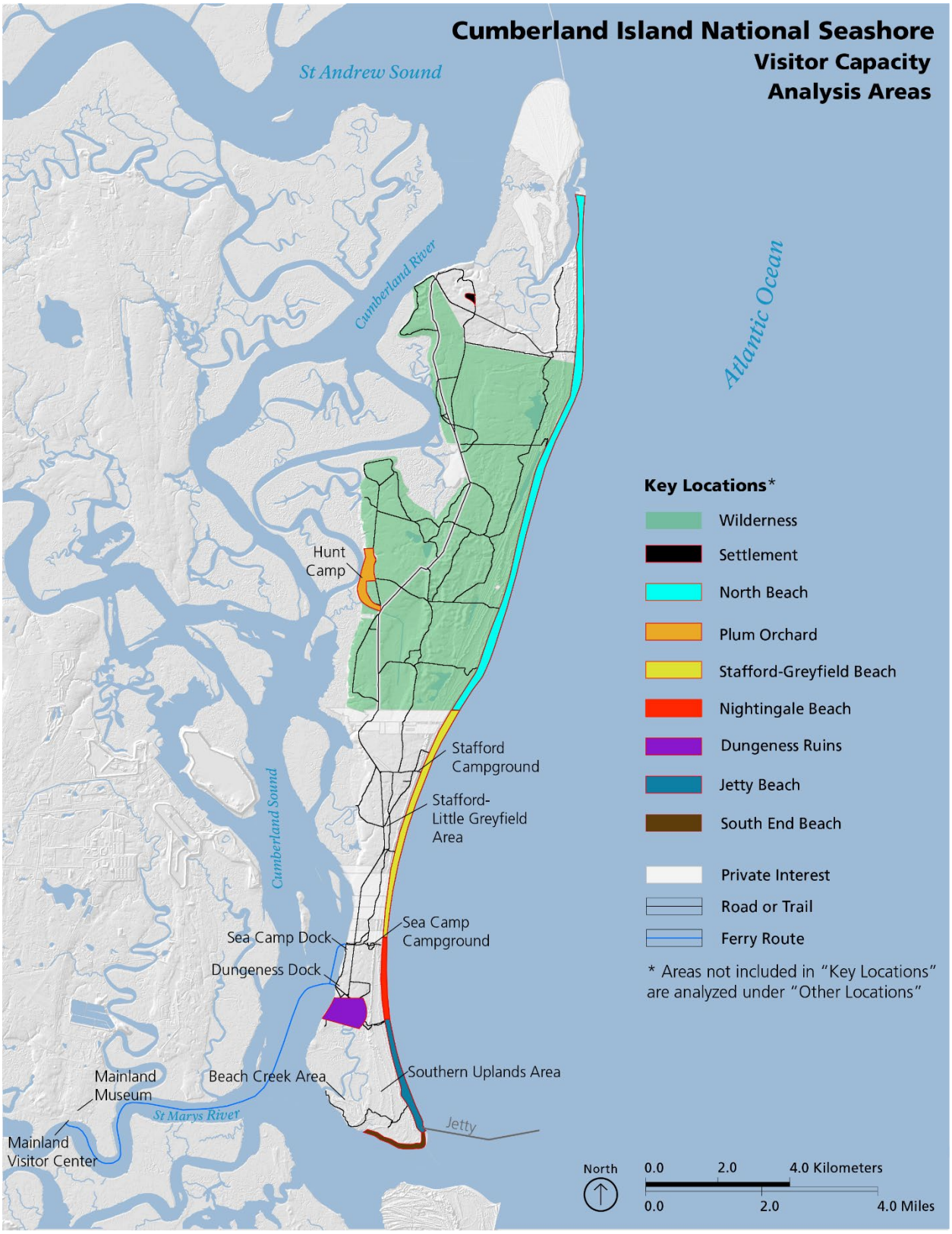


Figure B-1. Map of Visitor Capacity Analysis Areas Including Key Locations (colored polygons) and Other Locations (points indicated with text)

Review Existing Direction and Knowledge

During this step, the planning team reviewed desired conditions, indicators, and thresholds, with particular attention to conditions and values that must be protected and are most related to visitor use levels. Desired conditions are described in chapter 2, and indicators and thresholds are described in appendix A. A description of the desired conditions and any relevant indicators and thresholds is included in the analysis for each analysis area.

To identify the appropriate visitor capacity at the given analysis areas, a variety of social science data were reviewed to understand current conditions compared to desired conditions. The planning team reviewed social science studies that have been completed on the visitors to Cumberland Island. In 2010 and 2011, researchers from Clemson University and the University of Vermont gathered information on visitor use levels, the number of people in view at key destinations, perceptions of crowding, quality of experiences, and visitor preferences (Hallo et al, 2012). In 2016, researchers from the University of Utah and Kansas State University gathered information related to the distribution of visitor use on Cumberland Island, specifically hiking travel patterns on the south end of the island by day visitors (Peterson, Brownlee, and Sharp, 2016). In 2018 and 2019, researchers from Clemson and Kansas State conducted a similar study to the one conducted in 2010 and 2011 to provide comparability and a needed update, as well as a new analysis of temporal and spatial distributions of wilderness users' travel patterns (Brownlee et al, 2019). All three of these reports are referenced frequently (by year published) in this section.

TABLE B-1. CUMBERLAND ISLAND SOCIAL SCIENCE STUDIES

Study Title	Authors	Year Published	Scope	Citation
2010-2011 Cumberland Island National Seashore Visitor Use Study	Hallo, Manning, Brownlee, and Smith	2012	Research to support visitor carrying capacity decisions and alternative transportation planning.	Hallo et al. 2012
Understanding Visitor Use at Cumberland Island National Seashore	Peterson, Brownlee, and Sharp	2016	Research to understand the temporal and spatial distribution of day visitor use.	Peterson, Brownlee, and Sharp, 2016
Evaluation of the Relationship Between Current Conditions, Travel Patterns, Visitor Thresholds, and Ferry Services at Cumberland Island National Seashore	Brownlee, Sharp, Blacketer, Nettles, and Perry	2019	Research to collect, analyze, and interpret information that will help support visitor use management and associated planning.	Brownlee et al. 2019

The 2016 study showed that the majority of day use visitors who arrive on the ferry stay in the Sea Camp and Dungeness area. Fewer than 20% of these visitors travel to the Little Greyfield Area, the Raccoon Keys and Jetty Area, or the northern part of the island (figure B-2).

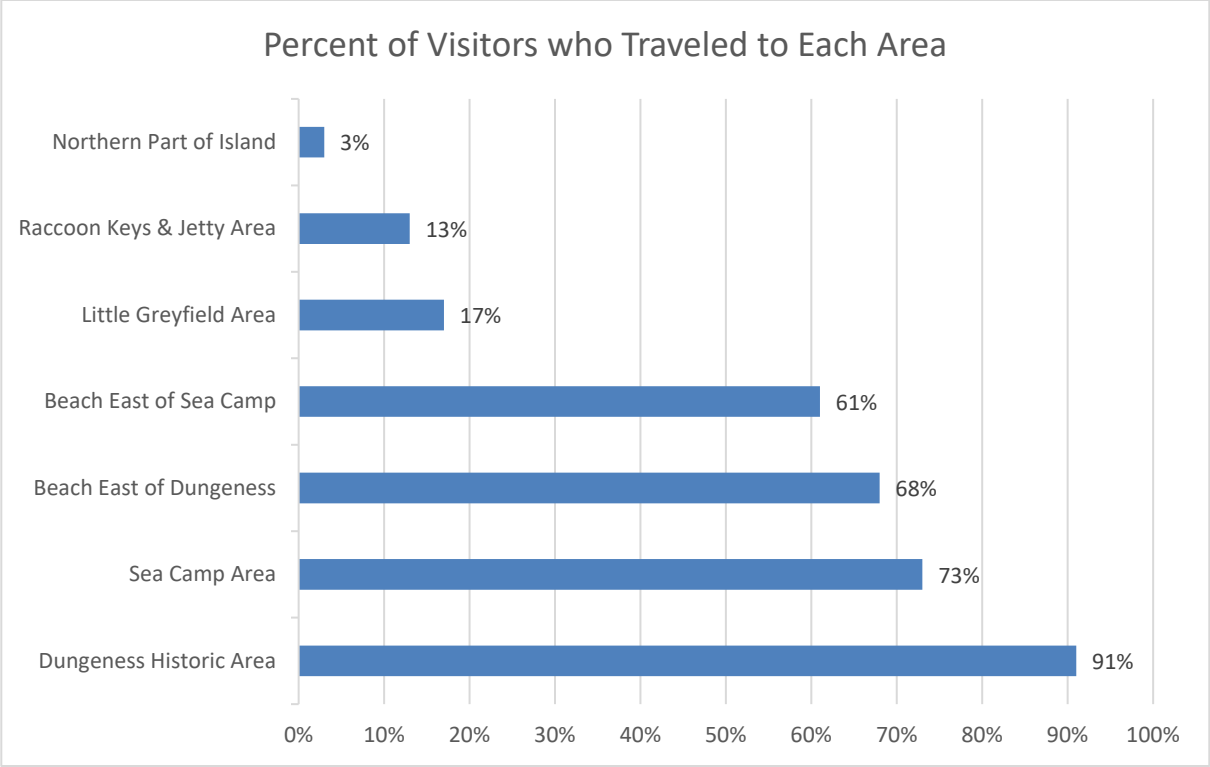


Figure B-2. Percent of Visitors Who Traveled to Each Area (Data Source: Peterson, Brownlee, and Sharp, 2016)

The day use visitors who arrive by ferry largely follow a u-shaped visitation pattern from Dungeness Dock, along Nightingale beach, and back to Sea Camp Dock (see figure B-3). This general travel pattern is recommended by park staff verbally and through informational materials.

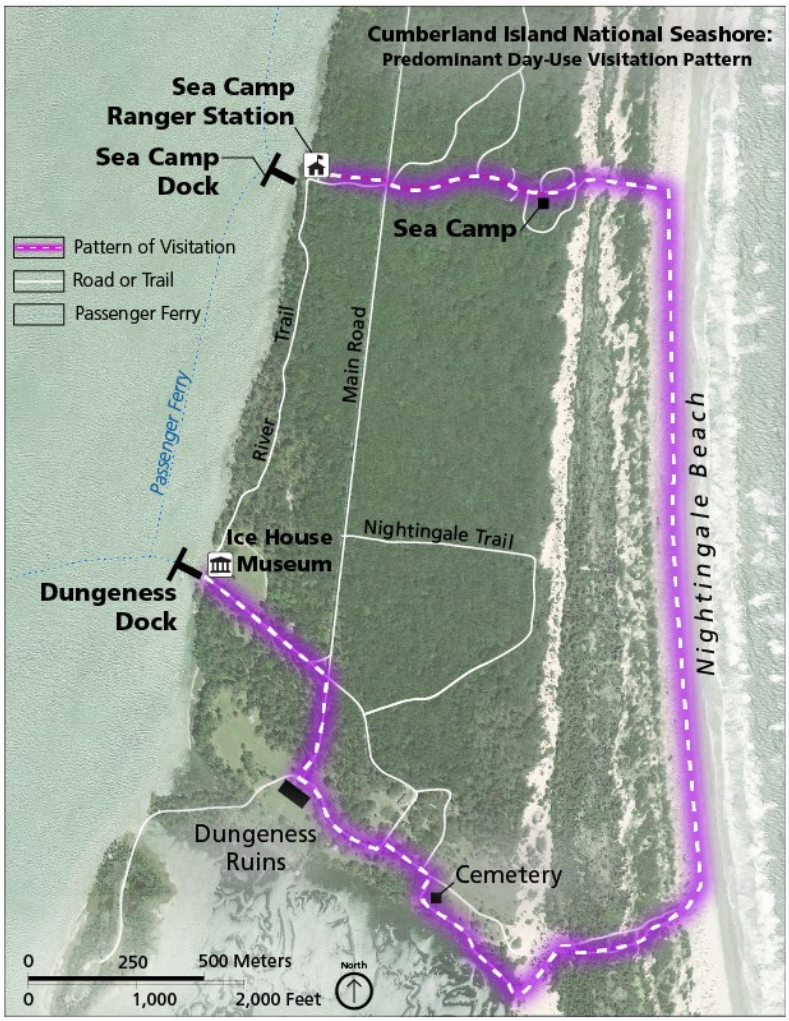


Figure B-3. Map of the Predominant Day-Use Visitation Pattern on Cumberland Island (Data Source: Peterson, Brownlee, and Sharp, 2016)

The 2016 study does not include visitors that arrive by private vessel or from one of several private inholdings on the island. This is one of the shortcomings of the study, as park staff have noted a significant increase in the number of visitors arriving by private vessel and landing on the island, particularly in the South End beach area.

The ferry schedule varies seasonally, though it generally includes two arrivals, one mid-morning and one early afternoon, and two or three departures from mid-morning to late afternoon. Since most visitors arrive by park ferry, peak use occurs during the middle of the day, between 11:00 a.m. and 1:00 p.m. (Peterson, Brownlee and Sharp 2016).

Most visitors to Cumberland Island are on foot for the duration of their visit because of the lack of road access to the island. Approximately 15% of visitors use bikes, however. Most of these bikes are rented at Sea Camp from the park concessioner. Bikes (which include e-bikes) are currently allowed on roads on the island and on the beach between Sea Camp and Dungeness, they are not allowed on

park trails. A few visitors also see the park via vans on the Lands and Legacies Tour. Fifteen percent of visitors take this tour (Hallo et al 2012). Private residents and retained rights holders also drive on the roads and, in some cases, on the beach.

In 1974 and 1975, shortly after establishment of Cumberland Island National Seashore, social science researchers Albert Ike and James Richardson from the University of Georgia conducted a capacity study of the island. Ike and Richardson used many of the same concepts that are presented here in the current capacity analysis. For instance, their study defined "recreational carrying capacity" as "the maximum number of people, involved in a given activity, that can be supported by a given site without degrading the environment or the quality of the visitor's experience," which is similar to, though not identical to, the definition of visitor capacity used here. Likewise, Ike and Richardson were careful to convey that their capacity represented an "absolute maxima" of people that might visit the island, and that park managers could be expected to "start with relatively low numbers of visitors, and that they will increase density according to a cautious plan of trial, observation, and reassessment." This approach is analogous to understanding of the capacities describe in this appendix and the adaptive management approach for ferry delivery described in the technical report included as appendix C.

Ike and Richardson also recognized the importance of a quality visitor experience, and their management objectives included a "back to nature" experience that would allow the seashore to fulfill its function as an example of "wild America." Other management objectives included avoidance of conflicts with the natural environment and recreational experiences that were regionally unique, educational, and emotionally and spiritually satisfying for the visitor. Finally, Ike and Richardson recognized that visits to Cumberland Island should be a rare experience that does not duplicate similar visits to other coastal islands such as Jekyll Island and neighboring beaches to the south. These management objectives echo the desired conditions that are found in chapter 2 of the CUIS Visitor Use Management Plan/EA and serve as the basis for this visitor capacity analysis.

However, Ike and Richardson's study has some important differences from the analysis that will be presented here. For example, their study sums the capacities identified for distinct geographic segments across the island to reach a total of roughly 14,000 people per day on the island. This is a divergence from the approach taken as part of this planning effort in that this capacity analysis keeps the capacities at the analysis area level in recognition of the distinction between capacity, which is determined on a localized scale based on protection of resource and experiential conditions, and delivery of visitors to the island, which is a management tool that influences the conditions found on the island in a very general way.

Another area of divergence is that Ike and Richardson's study identifies two areas that would serve as "high-density use areas" and two areas that would serve as "high-density swimming beaches." One of these high-density use areas, Dungeness, would have 2,000 people at one time in a 150-acre area. The high-density swimming beaches, two one-mile stretches of beach respectively near Dungeness and Sweetwater Lakes, would each have 4,000 people at one time. This would mean that there would be one visitor for every 1.32 linear feet of beach, which is a fairly high density of visitors in one area that would be inconsistent with management objectives defined for Cumberland Island, namely a "back to nature" experience exemplary of a "wild America" that does not duplicate the experiences found on other area beaches. Instead, the authors note that "Most people would probably prefer to swim on a protected (manned by life guards) swimming beach with a rather high density of swimmers." This is inconsistent with management objectives, or desired conditions, and is also inconsistent with the current methodology used in this plan for identifying visitor capacities.

As already noted, this analysis considers the protection of opportunities for solitude and low-density experiences—as well as sensitive resources like shore birds, sea turtles, and historic sites—to be

important and therefore a limiting attribute for purposes of identifying visitor capacities. The connection between protecting these resources and experiences, and capacities that are identified, will be made explicit throughout. This analysis updates the previous work by Ike and Richardson, along with past planning on visitor capacities for the park.

Identify the Limiting Attribute

The limiting attribute is the resource or experiential condition that most constrains the analysis area's ability to accommodate visitor use. The limiting or constraining attribute varies across the analysis areas and is described in detail under each key location. Identification of the most limiting attribute(s) is an important step given that a specific location could experience a variety of challenges regarding visitor use. Indeed, a failure to identify the limiting attribute appropriately was the major shortcoming of Ike and Richardson's study.

Identify Visitor Capacity

There are two parts to visitor capacity: the identification of visitor capacity and the identification of management strategies and actions to manage within the identified capacity. To identify the visitor capacity for each analysis area, the existing direction and knowledge and limiting attribute(s) were reviewed and current conditions were compared to desired conditions.

Visitor capacities in this section are most frequently expressed as the number of people at one time (PAOT). PAOT refers to the total number of people that are present in a defined area at any given point in time. The size of a defined area may vary depending on the analysis area, but are generally made to give park managers the most clarity and guidance to effectively monitor and ultimately manage use within the identified capacity. Occasionally, visitor capacities are expressed as the number of people per day (PPD). PPD refers to the total number of people that pass through an area throughout the day. In both of these metrics, "people" refers to individuals regardless of mode of transport (on foot, on a bike, or in a vehicle).

The identified visitor capacities will be used to inform and implement the management strategies selected as part of this visitor use management plan. Since the timing, amount, and distribution of visitation is driven primarily by aspects of the ferry's delivery of visitors to the island, management to maintain visitation levels within the identified capacities will occur largely through management of the ferry's delivery (see appendix C). Future monitoring of indicators described in appendix A will inform the National Park Service if use levels are nearing visitor capacities and related potential management strategies described in the indicators may also be implemented to maintain use within visitor capacities.

Key Locations

Nightingale Beach

Analysis Area and Introduction — For the purposes of this visitor capacity analysis, "Nightingale Beach" is the segment of beach between Sea Camp Crossing and Dungeness Crossing. It is the most accessible, and therefore, most popular beach segment along Cumberland Island's shore.

Existing Direction and Knowledge — The majority of day-use visitors—61% to 68%—visit Nightingale Beach at some point during their trip to Cumberland Island (Peterson, Brownlee and Sharp 2016). The 2019 field camera study revealed that someone was in view at Nightingale beach for only 13% of the daytime hours between 7:00 a.m. and 7:00 p.m. Someone is much more likely to be within view during the middle of the day, between 11:00 a.m. and 3:00 p.m., when the percent of time somebody is in view rises to nearly 50% (see figure B-4).

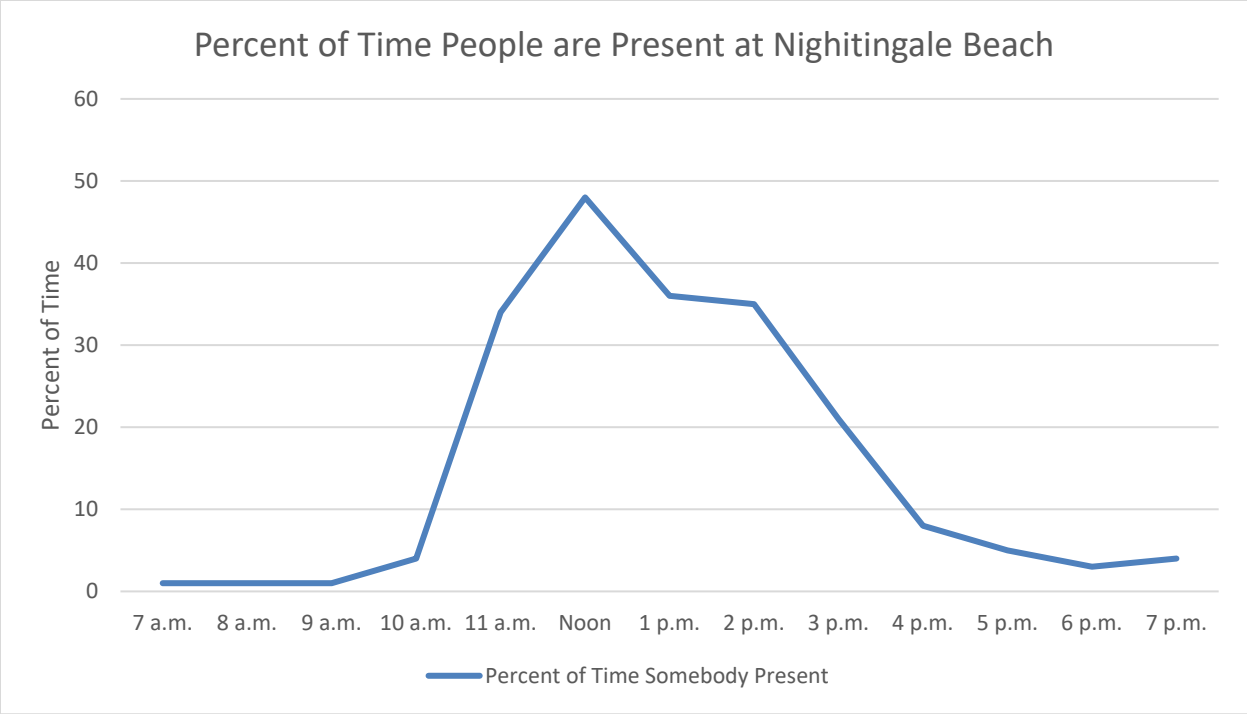


Figure B-4. Percent of Time People are Present at Nightingale Beach. (Data Source: Brownlee et al. 2019. Note: Study referred to this area as "East Beach.")

Of the times when someone was there, the average people per view was 3.4, the median was 2, and the maximum was 42. This high maximum was not typical, though it did occur twice on weekdays in the spring season. The more typical maximum number of people observed was much lower, as the average maximum people per view for weekdays, weekends, and holidays was 10, 9, and 5, respectively. The 90th percentile maximum people per view peaks between 9 and 11 people per view from 11:00 a.m. to 2:00 p.m. (see figure B-5). This 90th percentile day reflects the "typical busy day."

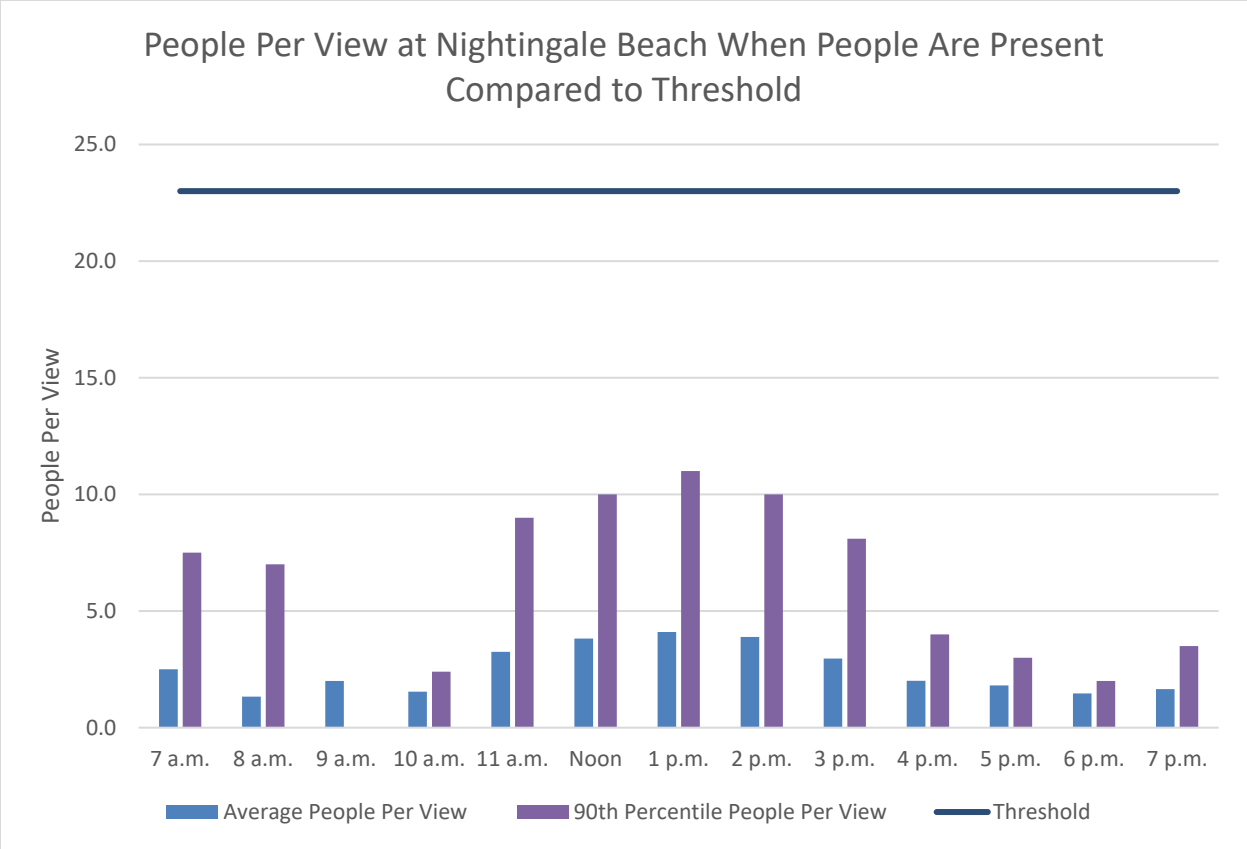


Figure B-5. People Per View at Nightingale Beach When People Are Present. The chart notes both the average and the 90th percentile of People Per View under current conditions in comparison to the threshold of 23 PPV. Note that the calculations for average and 90th percentile people per view only include observations when at least one person was present.

Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. The zone description for the Nightingale Beach area, which falls into the natural environment zone, describes that visitors will have opportunities for low-density experiences, and that they can experience pristine and expansive stretches of beach and understand its significance. Pristine beaches like Nightingale, are fundamental resources of the park (Foundation Document 2014). The Foundation Document notes that Cumberland Island provides exceptional public access to undeveloped, uncrowded, pristine beaches. Beaches like these are increasingly rare, especially on the east coast of the United States. For these reasons, a threshold of 23 PPV was identified for Nightingale Beach (see appendix A).

Limiting Attribute — Access to the sort of low-density shoreline experience described in the desired conditions above is the limiting attribute that most constrains Nightingale Beach's ability to accommodate visitor use. Across multiple survey efforts (Hallo et al 2011; Brownlee et al. 2019) and public comment periods (see Public Comment Summary Report, 2019) visitors have clearly expressed the importance of NPS' continued protection of the island, and specific locations on the island, as low-density experiences that are categorically different from the other barrier island experiences available in the region. While there are some sea turtles and shorebirds that use this area of the beach, monitoring efforts have shown that relatively high use of this beach (compared to other

beach segments) does not adversely impact these populations. Therefore, the protection of access to a low-density shoreline experience, rather that protection of natural resources, is the limiting attribute that most constrains the Nightingale Beach's ability to accommodate visitor use. Access to a low-density shoreline experience can be expected to occur when use levels remain within the identified threshold of 23 PPV at Nightingale Beach (see appendix A).

Visitor Capacity — To identify visitor capacity, it is necessary to translate the threshold of 23 PPV to an actual density. Since the functional "view" used to identify the benchmarks in the studies was approximately one-third mile, the visitor capacity is identified as 69 people at one time per mile of beach (3 x 23 = 69). The actual use levels observed during the study period were generally lower than this capacity of 69 people per mile of beach, however a few select days did exceed this number between noon and 2 p.m., occurrences that were typically accounted for by education programs. However, these occurrences were minimal, and represented approximately 0.0018% of the total observations during the study period. Additionally, 95% of the time there are less than 14 people per 1/3 mile of beach. Potential future management strategies identified in appendix A are designed to manage these spikes should monitoring reveal that they persist or worsen over time.

Stafford-Greyfield Beach and Jetty Beach

Analysis Area and Introduction — For the purposes of this capacity analysis, "Stafford-Greyfield Beach" is the segment of beach between Sea Camp Crossing and the southern Wilderness boundary. "Jetty Beach" is the segment of beach between Dungeness Crossing and the Jetty. While not nearly as popular as Nightingale Beach, Stafford-Greyfield and Jetty beaches are used by more visitors than the North Beach.

Existing Direction and Knowledge — The 2019 studies focused on conditions and experiences at Nightingale beach and did not gather data for the Stafford-Greyfield or Jetty beaches. Stafford-Greyfield and Jetty beaches share desired conditions guidance with Nightingale beach. This means that the desired conditions for visitor experiences of the entire park, which articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation, also apply to Stafford-Greyfield and Jetty beaches. These two beaches also fall into the natural environment zone, which describes that visitors will have opportunities for low-density experiences, and that they can experience pristine and expansive stretches of beach and understand its significance. The Foundation Document's notation that the island's beaches provide exceptional public access to undeveloped, uncrowded, pristine beaches also applies to Stafford-Greyfield and Jetty beaches.

Where Stafford-Greyfield and Jetty beaches differ from Nightingale beach is in terms of current use levels and patterns. According to the 2016 study of visitor use patterns, around 17% of day use visitors visit the area that includes Stafford-Greyfield Beach, and around 13% visit the area that includes Jetty Beach. It should be noted that not all of these visitors necessarily visited the respective beaches, as the study did not distinguish between the beach-based analysis areas and inner island locations, so the 17% and 13% figures are on the high end of actual use. When compared with the 61% to 68% of day use visitors who visit Nightingale Beach, Stafford-Greyfield and Jetty beaches receive three to five times fewer visitors. These beaches receive lower levels of use largely due to the fact that day use visitors tend to follow the u-shape visitation pattern from Dungeness Dock, along Nightingale Beach, and back to Sea Camp Dock. Most visitors do not choose to experience the Stafford-Greyfield or Jetty beaches which are located immediately north and south, respectively, of this u-shape travel pattern.

Limiting Attribute — Since Stafford-Greyfield and Jetty beaches do not receive as much visitation as Nightingale Beach, it can be said that they provide even greater opportunities for visitors to have a low-density shoreline experience that is categorically different from the other barrier island

experiences available in the region. These beaches are also better habitat for bird foraging and sea turtle nesting than Nightingale Beach because of the lower levels of human activity and disturbance to these species. Artificial light at night can disrupt sea turtle navigation and human activity can cause birds to flush more frequently. However, visitors are prohibited from using artificial light at night, and the current amount of light is well below the amount that would impact the turtles. Monitoring efforts have shown that use of this beach does not adversely impact populations of shore birds. Therefore, the protection of access to a low-density shoreline experience, as emphasized in multiple survey efforts (Hallo et al. 2011; Brownlee et al. 2019) and public comment periods (Public Comment Summary Report, 2019], is the limiting attribute that *most* constrains the Stafford-Greyfield and Jetty beach's ability to accommodate visitor use. Protection of sea turtle and shore bird habitat likely constrains the area's ability to accommodate visitor use to a lesser degree.

The 2012 and 2019 studies that assessed Cumberland Island visitors' preferences for the number of people on the seashore's beaches generally focused on the acceptability of various condition scenarios (Hallo et al. 2012; Brownlee et al. 2019). These studies described various benchmarks including the point at which the average visitor would be displaced from an area, the point at which the average visitor believes management action should be taken to address crowding, minimal acceptable conditions for the average visitor, and also a preferred condition level for the average visitor. While the visitor capacity for Nightingale Beach (see above) is based on the threshold of 23 PPV, which is tied to the management action required benchmark, the planning team elected to base the analysis of visitor capacity for Stafford-Greyfield and Jetty beaches on the preferred condition benchmark. This was done to protect the greater opportunities for low-density shoreline experiences that Stafford-Greyfield and Jetty beaches currently provide by virtue of being off the well-trodden u-shaped pattern that travels along Nightingale beach. This differentiation provides for a spectrum of low to lower density experiences along the Cumberland Island shoreline. The 2012 study found that visitors prefer to see between four and nine people per view. The 2019 study did not independently evaluate this metric. Identifying the visitor capacity in the four to nine range would provide visitors with opportunities for an experience that is not just acceptable, but rather, preferable.

Visitor Capacity — Given that the Stafford-Greyfield and Jetty beaches are adjacent to the popular Nightingale Beach, and not quite as remote as the North Beach (see below), the planning team identified a visitor capacity toward the upper end of the range of preferable conditions, at eight people per view. Since the functional "view" used to identify the preferable condition in the studies was approximately one-third mile, the visitor capacity is identified as 24 people at one time per mile of beach (3 x 8 = 24). Since the average maximum people at one time per one-third mile of Nightingale Beach on weekdays, weekends, and holidays was 10, 9, and 5, (30, 27, and 15 people at one time per mile) respectively, and since Nightingale beach is visited by three to five times more visitors, it can reasonably be assumed that current use levels at Stafford-Greyfield and Jetty beaches are well below the 24 people per mile of beach capacity.

North Beach

Analysis Area and Introduction — For the purposes of this capacity analysis, "North Beach" is the segment of beach that stretches from the southern Wilderness boundary north to Long Point. North Beach receives the fewest visitors of any of the beaches. It should be noted that the majority of North Beach is immediately adjacent to the Cumberland Island Wilderness, but as the eastern Wilderness boundary is the mean high tide line, the beach itself is not within Wilderness.

Existing Direction and Knowledge — The desired conditions for visitor experience of the entire park, which articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation, apply to North Beach. The Foundation Document's notation that the

island's beaches provide exceptional public access to undeveloped, uncrowded, pristine beaches also applies to North Beach. North Beach falls into the natural environment zone (see chapter 2). The desired conditions for the natural environment zone describe that visitors will have opportunities for low-density experiences, and that they can experience pristine and expansive stretches of beach and understand its significance.

According to the 2016 study of visitor use patterns, less than 4% of day use visitors visit the northern part of the island. Many, if not most, of these visitors likely spend their time in the Plum Orchard and Settlement areas and do not visit North Beach, so 4% is on the high end of actual use by day use visitors. The few visitors that do visit the North Beach tend to be wilderness backpackers and island residents and their guests. For wilderness backpackers, the 2019 study revealed that around 9% of the total distance they traveled occurred on the North Beach. While there is no data on the private residents' use, park staff have observed that overall, visitor activity that does occur on North Beach tends to be focused near South Cut Trail, North Cut Road, and Long Point, with patches of activity where the Willow Pond and Duck House trails arrive at the beach. These are locations where campers and island residents tend to arrive at the beach. Sometimes these groups move along quickly as they are accessing other areas by foot or by motor vehicle, while at other times these groups tend to linger in one spot for a while. Overall, use levels tend to be very low at the North Beach. While some beach driving does occur, it is clear that North Beach is categorically different from the other beaches with far fewer visitors and much greater opportunities to have low-density experiences and even experience solitude.

In addition to providing opportunities for the lowest density shoreline experiences on an island known for access to uncrowded settings, North Beach is also great habitat for bird and sea turtle activity such as eating, foraging, nesting, and roosting. As mentioned above, visitor activity can impact wildlife, which is of particular concern along North Beach since shorebird nesting, as well as sea turtle activity, tends to increase as one moves north along the seashore into the North Beach. Park managers are not currently concerned about the overall levels of use impacting wildlife, however they are concerned about a few use types, including beach driving and increasing illegal bike use, impacting these animals. Human activity's impacts to shorebirds on the North Beach is compounded by the fact that shorebirds residing there have lower exposure, and therefore lower tolerance, to people. These birds tend to be especially sensitive and will easily flush when humans are present. This flushing expends energy and is harmful to nesting success.

Limiting Attribute — Both facts about North Beach—that it provides the best opportunities for low-density experiences on the island, and that it serves as habitat for a greater concentration of more sensitive wildlife—point to a visitor capacity that is lower than at other beach segments along the shoreline. To quantify this lower visitor capacity, the 2012 and 2019 studies that assessed Cumberland Island visitors' preferences for the number of people on the seashore's beaches are again helpful. Similar to Stafford-Greyfield and Jetty beaches, the planning team elected to base the analysis of visitor capacity for North Beach on the *preferred condition*. The 2012 study found that visitors prefer to see between four and nine people per view. While the planning team identified the capacity for Stafford-Greyfield and Jetty beaches toward the upper end of this range, they identified visitor capacity as being toward the lower end of this range for the North Beach.

Visitor Capacity — To protect the wildlife and remote setting of this beach, and ensure opportunities for solitude continue to exist on the beaches of Cumberland Island, the visitor capacity for North Beach is tied to the lower end of the spectrum of preferred conditions at four PPV. Since the functional "view" used to identify the preferable condition in the studies was approximately one-third mile, the visitor capacity is identified as 12 people at one time per mile of beach (3 x 2 = 12). The visitor capacity of 12 people per mile of beach is protective of nesting shorebirds and is unlikely to create conditions where shorebirds frequently flush. This capacity also provides opportunities for

the lowest density experiences on the island and enhances the spectrum of low-density experiences along the seashore. While the social science surveys did not collect people per view data for North Beach, in the estimation of park staff it is reasonable to assume that current use levels at North Beach are usually at or below the 12 people per mile of beach capacity.

South End Beach

Analysis Area and Introduction — For the purposes of this capacity analysis, "South End Beach" is the roughly one-mile segment of beach that begins south of the Jetty and extends around the southern tip of the island toward the South End Ponds. In recent years, park staff have noted a significant increase in the number of visitors recreating at south end beach. Since most of these visitors arrive by private vessel, the proposed action includes designation of a boat landing area for a one-third mile stretch in the middle of South End Beach. In the boat landing area, landing, anchoring, beach walking, and other forms of access would be allowed. The westernmost portion of beach would be closed to all forms of public access to protect sensitive shorebird habitat. The one-third mile stretch between the boat landing area and the Jetty would be open to public access but closed to boat landing and anchoring for safety reasons.

It should be noted that the visitor use dynamics at the South End Beach are changing quite rapidly, and park managers are planning to collect more data regarding visitor use in the near future. While this capacity analysis is based on current knowledge and guidance, it will likely need to be revisited once more information about visitor use in the area is known.

Existing Direction and Knowledge — Visitors to the South End Beach arrive primarily by private vessel or unauthorized commercial vessel. South End beach is relatively far away from the Sea Camp and Dungeness docks, and the u-shaped visitation pattern that connects the two, and therefore few ferry-based day visitors visit South End Beach. According to the 2016 study of visitor use patterns, less than 13% of these visitors made it to areas broadly referred to as "Raccoon Keys and Jetty Area," which included South End Beach (Peterson, Brownlee, and Sharp, 2016). It can be assumed a much lower proportion of ferry-based day visitors actually visit South End Beach because of the further distance from the well-trodden u-shaped pattern that travels along Dungeness Crossing, Nightingale beach, and Sea Camp.

The private vessels and unauthorized commercial vessels deliver a number of visitors to the South End Beach area. During the 2019 study, researchers attempted to collect data on this use, though the effort was plagued by challenges including camera vandalism and robbery. Accordingly, the use level data collected during this effort is considered unreliable. However, much of the trend data, including that use levels tend to spike during the middle of the day and those users tend to venture further inland in the morning than in the afternoon is confirmed by anecdotal observation and is considered reliable (Brownlee et al, 2019).

Because of the challenges experienced by the 2019 remote camera-based data collection effort, park staff conducted a subsequent physical count of users in the South End Beach area on weekends and holidays during the summer of 2019. This data collection effort focused on the busiest days during the May through July period and included a count of the total number of people on the beach as well as other data of interest including the number of dogs on and off-leash and the number of boats on or near the shoreline. The count showed that on the busiest days of the summer, Independence Day and Memorial Day, there were 418 and 225 people on the beach at one time, respectively. However, on the non-holiday weekend days, observed use levels were much lower and ranged from eight to 58. The median observed use level on all holiday and weekend days was 42, while the average of all these days was 72 (see figure B-6). These users were spread across the one mile of the South End Beach that is currently open to public access.

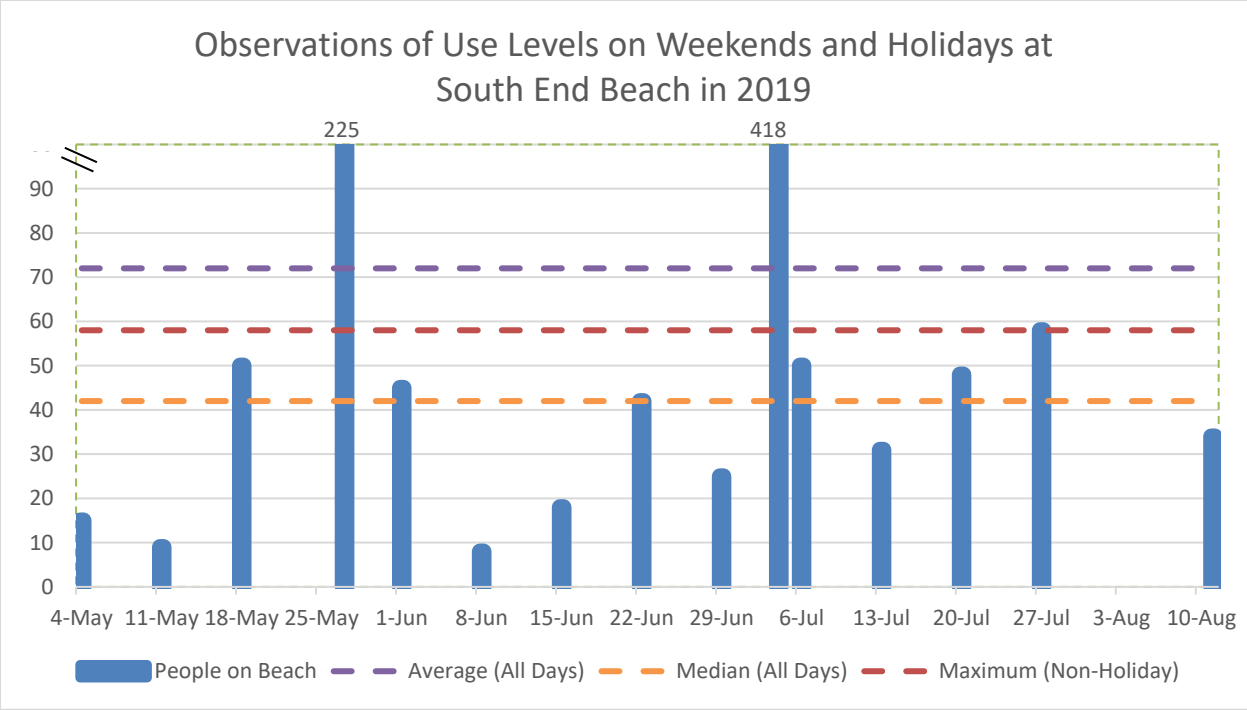


Figure B-6. Levels of Visitor Use Observed By Park Staff During the Spring and Summer of 2019

Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. The South End Beach area includes some areas that are part of the environmental protection zone and other areas that are part of the natural environment zone. In the environmental protection zone, visitor use should be consistent with prioritizing resource protection goals and protecting low density and low impact recreational experiences. Use is managed to perpetuate wildlife (i.e., Shorebirds, marine mammals) values with little human intrusion, and natural resources and processes remain largely unaltered by human activity. In the natural environment zone, active recreational opportunities dominate, and low-density experiences are provided. Visitors have the opportunity to experience pristine and expansive stretches of beach and to understand the significance of this resource. Natural resources and processes should remain largely unaltered by human activity, and visitor impacts are kept to a minimum. Visitor use should not impact the overall health and integrity of ecosystems.

Given the desired conditions for the environmental protection zone, areas within that zone would be closed to public access under the preferred alternative to protect shorebird habitat. A designated boat landing area, which would correspond with the natural environment zone, is also included in the preferred alternative (figure B-7). In this boat landing area, visitors would be allowed to land their watercraft, move about the area and toward the Jetty.

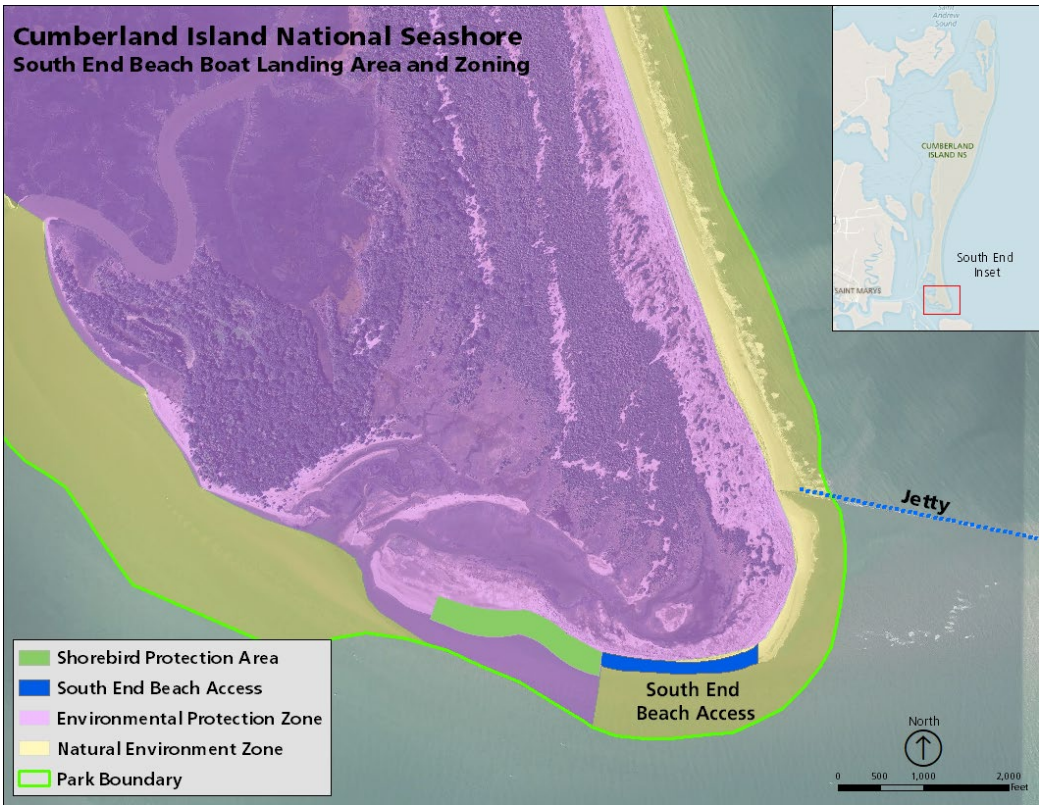


Figure B-7. Map showing the South End Boat landing area in relationship to management zoning

Limiting Attribute — Access to a low-density shoreline experience and the protection of natural resources to ensure they are unaltered by human activity, as described in the description of the natural environment zone, are the limiting attributes that most constrain South End Beach's ability to accommodate visitor use in the areas open to the public. Across multiple survey efforts (Hallo et al. 2011; Brownlee et al. 2019) and public comment periods (see Public Comment Summary Report, 2019) visitors have clearly expressed the importance of NPS' continued protection of the island, and specific locations on the island, as low-density experiences that are categorically different from the other barrier island experiences available in the region. Similarly, the South End Beach area is important to wildlife, namely shorebirds, as demonstrated by the designation of much of this area as a Shorebird Protection Area.

As described for the other beaches, park managers have an understanding of visitor preferences for the number of people on the beach from the social science studies. Specifically, the 2019 study indicated that visitors' preferred condition is eight people per view, minimal acceptable condition is 20 people per view, and displacement level is 27 people per view. These were the preferences of visitors who travelled to and from the island by ferry. Park managers also understand from observation that visitors to the South End Beach, who predominantly arrive by private vessel, may have a slightly higher tolerance for people per view. Park managers can infer from current observed activity that visitors to the South End Beach desire a somewhat more social experience than visitors to other areas of the island.

With this desire for a more social experience in mind, park managers also recognize that the desired conditions for visitor experiences and natural resources on the island dictate that visitor use needs to be managed to protect resources and preserve some degree of low-density experience. Accordingly, visitor use levels in the range of 200-400 people at one time are not appropriate.

Visitor Capacity — Considering the desired conditions and visitors to the area's apparent tolerance for somewhat higher levels of visitation, park managers identified a visitor capacity of 60 people at one time in the open portions of the South End Beach. Since the open portion of South End Beach is roughly 2/3 mile, this capacity translates to roughly 30 people per view. Sixty people at one time on the entirety of South End Beach is just above the maximum level (58) that was observed on non-holiday weekend days during the spring and summer 2019. Since these observations were only made on the busy days, this capacity can be understood to be at or slightly above the level of a busy day, and well above what occurs on the typical day. It is also understood that this visitor capacity is well below the 225 and 418 users that were observed on holidays during that summer. These extremely high levels of visitation are not consistent with the desired conditions for visitor experiences or natural resources in the area.

It should be noted that visitors observed during the summer of 2019 counts were spread across the roughly one-mile stretch of the South End Beach that is currently open to the public. Upon implementation of the plan and the establishment of the boat landing area, visitation would be concentrated within the two-thirds mile stretch of beach that remains open. This means that the density visitors experience would be comparable to that currently experienced when about 90 visitors are at the South End Beach. This level of visitation is 50% more than what was observed on any weekend day during the summer of 2019 and was only observed on Memorial and Independence days.

The visitor capacity of the Shorebird Protection Area at South End Beach would be zero as it would be closed to public access under the preferred alternative.

Dungeness Ruins

Analysis Area and Introduction — The Dungeness Ruins analysis area includes the Dungeness Historic District. This area is one of the most frequently visited locations on the island.

Existing Direction and Knowledge — Many ferry-based day-use visitors travel through the Dungeness area during their visit. More than 91% of day use visitors go to the Dungeness Historic Area and 84% visit the ruins (Peterson, Brownlee and Sharp 2016).

The 2019 field camera study revealed that someone was in view at Dungeness Ruins for 30 percent of the daytime hours between 7 a.m. and 7 p.m. Someone was much more likely to be within view later in the day, after 10 a.m., when the percent of time somebody is in view rises up to 50% (See figure B-8).

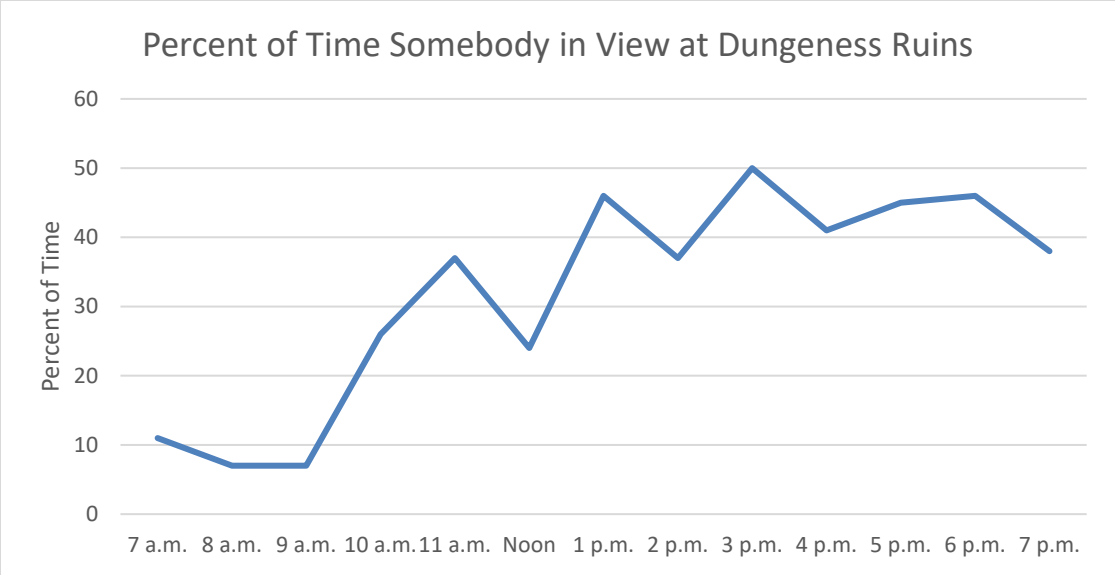


Figure B-8. Percent of the time that at least one person was in view at Dungeness Ruins during the 2019 field camera study (Data Source: Brownlee et al. 2019)

During the study, of the times when someone was in view at Dungeness Ruins, the average people per view was 2.5, the median was 2, and the maximum was 40 (see figure B-9). This high maximum was not typical, as the average maximum people per view for weekdays, weekends, and holidays was 13, 9, and 6, respectively. Additionally, 95% of the time at Dungeness Ruins there are less than 10 people during peak periods of the day (1:00-2:00).

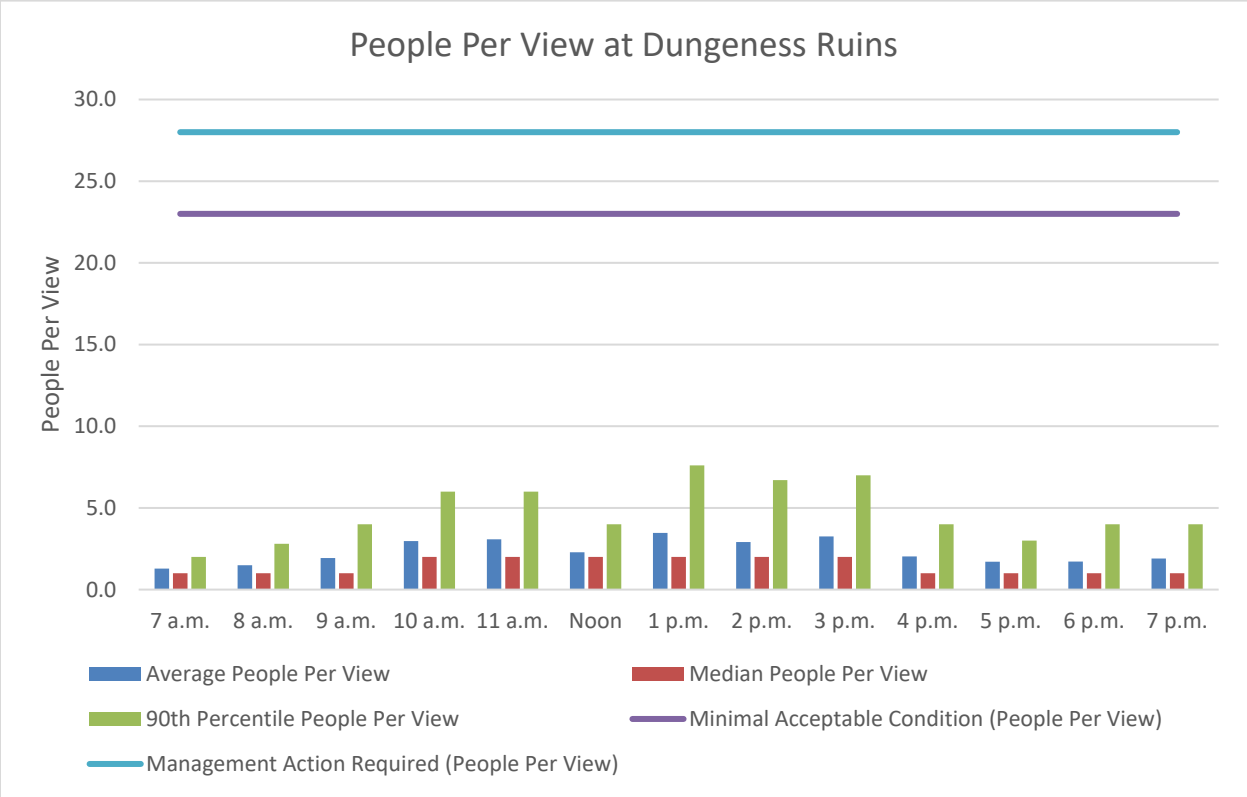


Figure B-9 People Per View at Dungeness Ruins. Note that the calculations for average, median, and 90th percentile people per view only include observations when at least one person was present (Data Source: Brownlee et al. 2019)

Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. The Desired Conditions for the Historic Zone, which includes the Dungeness Ruins, state that visitor recreation is generally contemplative, quiet, and consistent with the area's historic context. Visitors should have the opportunity to understand, develop values about, and develop a respect for the sensitivity of the island's cultural resources. The integrity of historic districts should not be impacted by visitor use.

Limiting Attribute — Access to this uncrowded setting with opportunities for contemplative, quiet recreation consistent with the area's historic context is the limiting attribute that most constrains this area's ability to accommodate visitor use. Indeed, current use patterns are illustrating this constraint. Visitors tend to platoon, or gather in groups, in the Dungeness area. This creates pulses of crowding around the Dungeness Ruins and along the boardwalk to the beach area. However, visitors have expressed preferences for an uncrowded setting there at Dungeness Ruins.

The same studies that assessed Cumberland Island visitors' preferences for the number of people in view on the island's beaches also assessed visitor preferences at Dungeness Ruins. Like they did for the beaches, these studies generally show that visitor acceptability of conditions decreases as the number of people in view increases (Hallo et al 2012; Brownlee et al 2019).

The 2012 study found that visitors' minimal acceptable condition is 20 people per view. The 2019 follow-up study found that visitors' minimal acceptable condition was 23 people per view. Both studies found that the point where visitors believe management action should take place is 28.

Visitor Capacity — Park managers considered the two studies and elected to base visitor capacity identification on the 2019 study. The two studies indicate that visitor tolerances for crowding at Dungeness Ruins have marginally increased over time. As the more recent study is likely more reflective of current visitor attitudes and preferences, park managers elected to rely on it.

Park managers elected to base the visitor capacity identification for Dungeness Ruins on the minimal acceptable condition, 23 PPV, as this benchmark represents the point at which conditions become unacceptable for the average visitor, and park managers want conditions at this popular destination to be generally acceptable.

This analysis assumes that visitors can only see about one quarter of the other people at the site from any given location. This estimate is based on the assumption that peoples' binocular (non-peripheral) field of view is about 115 degrees. This 115-degree field of view is what the 2012 and 2019 studies represented in their photo simulations. This 115-degree field of view is just under one third of the possible 360 degrees that other people could be in three-dimensional space. Given the setting around the Dungeness Ruins, which is expansive and includes structures and vegetative cover, it is assumed some people within the field of view will not be seen (e.g. they are on the other side of a building or tree), likely accounting for about 8-10% of people present. This means that each viewshed that visitors experience captures on average about one quarter of the people at this site. Therefore, the visitor capacity for the Dungeness Ruins area is 92 people at one time.

23 people per view x 4 viewsheds = 92 people at one time

The 2019 field camera study revealed that, of the times when someone was there, the average people per view at Dungeness Ruins was 2.5, the median was 2, and the maximum was 40 (see figure B-9, above). The average maximum people per view for weekdays, weekends, and holidays was 13, 9, and 6, respectively. Therefore, the actual use levels observed as part of the 2019 study were generally much lower than this capacity. Given the assumption that approximately one quarter of the people at the site are within view, current use levels appear to be well below the capacity of 92 PAOT.

Plum Orchard

Analysis Area and Introduction — The Plum Orchard Historic District includes the Plum Orchard mansion, surrounding grounds, and associated support structures. Access to Plum Orchard is currently somewhat difficult, though it receives moderate levels of visitation.

Existing Direction and Knowledge — Plum Orchard is located along the western edge of the island along the Brickhill River about 7 miles north of the Sea Camp dock. Because of its relatively remote location, Plum Orchard is currently somewhat difficult to access, though ferry service directly to Plum Orchard as described in the preferred alternative would change this. Some public day-use dock space is available at Plum Orchard on a first-come, first-served basis and is not actively managed. Visitors to Plum Orchard can tour the mansion with volunteer guides on a first-come, first-served basis and may explore the surrounding grounds on their own.

Cumberland Island's four National Register historic districts, including Plum Orchard, are fundamental resources of the park, and their continued protection is essential as they are a crucial part of the significance of the park (Foundation Document 2014). Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. The Desired Conditions for the Historic

Zone, which includes Plum Orchard, state that visitor recreation is generally contemplative, quiet, and consistent with the area's historic context. Visitors should have the opportunity to understand, develop values about, and develop a respect for the sensitivity of the island's cultural resources. The integrity of historic districts should not be impacted by visitor use.

Limiting Attribute — Preservation of opportunities for contemplative, passive, and quiet opportunities to experience Plum Orchard is the limiting attribute that most constrains Plum Orchard's ability to accommodate visitor use. While the Plum Orchard mansion was at times a place for entertaining large numbers of guests, and it could be said that large groups of visitors would be consistent with aspects of the site's history, public comment has made it clear that the idea of a peaceful mansion surrounded by Wilderness has captured the modern visitor's imagination. The planning team has determined that protection of opportunities to experience this peace and quiet should prevail. Protection of the integrity of the historic house itself also constrains the ability of Plum Orchard to accommodate visitation.

Visitor Capacity — To preserve opportunities for contemplative, passive, and quiet opportunities to experience Plum Orchard and protect the integrity of the historic house and surrounding grounds, it is necessary to consider use both inside and outside the house. Through experience, park volunteers have learned that the house can accommodate no more than three tours at one time without the tours coming into conflict. Likewise, these tour groups can be no larger than 15 people if a contemplative experience protective of the historic resource is desired. If more tours were to occur at once, or the tour groups were to be any larger in size, the tour groups would become difficult to manage as the visitors wander through small linear areas and become disconnected from their group. Together, these two factors indicate that no more than 45 people can be in the Plum Orchard mansion at one time (3 x 15 = 45).

To assess the number of people that can be on the surrounding grounds at one time, the planning team referred to the studies which assessed visitor preferences for the number of people per view at the Dungeness Historic District (no study was conducted at Plum Orchard, so the best available data is from this other historic district where a similar experience is desired). The 2012 study found that visitors identified 20 people per view as the minimal acceptable condition (Hallo et al 2012). The 2019 follow-up study found that visitors identified 23 people per view as the minimal acceptable condition (Brownlee et al 2019).

Since the 2019 study is more recent and therefore more reflective of visitors' current attitudes, park managers decided to apply the acceptability standard from this study. Therefore, the visitor capacity reflects the higher minimal acceptable of 23 people per view.

This analysis assumes that visitors can only see about one quarter of the other people at the site from any given location. This estimate is based on the assumption that peoples' binocular (non-peripheral) field of view is about 115 degrees. This 115-degree field of view is what the 2012 and 2019 studies represented in their photo simulations. This 115-degree field of view is just under one third of the possible 360 degrees that other people could be in three-dimensional space. This means that each viewshed that visitors experience captures on average about one third of the people at this site. Therefore, the visitor capacity for the Plum Orchard grounds is about 70 people at one time.

23 people per view x 3 viewsheds = (roughly) 70 people at one time

A total of 115 people at one time has been identified as the visitor capacity for Plum Orchard by summing the maximums of 45 people at one time in the house and no more than 70 people at one time on the grounds. These capacities are believed to be low enough that physical loading and wear and tear on the historic structure will not become an issue and desired conditions can be maintained

and achieved in the analysis area. Anecdotally, the planning team believes the current use levels are below the 115 people at one time capacity.

It should be noted that this capacity applies whether or not ferry service is provided directly to Plum Orchard and regardless of whether other services are provided there. Should ferry service be provided to Plum Orchard, as described in the preferred alternative, it would be done in a manner protective of this capacity.

There are a few occasions during the year when special events such as holiday tours or weddings by special use permit (grounds only) are likely to exceed the identified capacity of 115 people at one time. During these special events, visitors are not seeking or expecting a contemplative, passive, or quiet experience. Rather they are looking to celebrate and enjoy the company of friends and family. This celebratory atmosphere is consistent with Plum Orchard's historic context as a place of entertainment and fellowship and is appropriate for these isolated special events. Given their infrequent nature, just once to a few times per year, the higher use levels during the special events is not expected to affect the structural integrity or historic fabric of the Plum Orchard mansion.

Settlement

Analysis Area and Introduction — The Settlement area is located on the north end of Cumberland Island and includes the First African Baptist Church, a popular destination for Cumberland visitors, and other houses built by the descendants of freed slaves. Access to the area is challenging, so current use levels are not particularly high.

Existing Direction and Knowledge — The settlement is primarily accessed by day users who participate in a Lands and Legacies Tour, wilderness users on overnight trips, and guests of Greyfield and other private properties. Visitors that arrive by Lands and Legacies Tour or that are guests of Greyfield arrive by van, typically in a group of 8 to 10 people. Wilderness users arrive by foot.

Like the other historic districts, the High Point-Half Moon Bluff area, which includes the Settlement, is a fundamental resource of Cumberland Island National Seashore. These historic districts are fundamental resources of the park, and their continued protection is essential as they are a crucial part of the significance of the park (Foundation Document 2014). Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. The Desired Conditions for the Historic Zone, which includes Plum Orchard, state that visitor recreation is generally contemplative, quiet, and consistent with the area's historic context. Visitors should have the opportunity to understand, develop values about, and develop a respect for the sensitivity of the island's cultural resources. The integrity of historic districts should not be impacted by visitor use.

Limiting Attribute — Preservation of opportunities for contemplative, passive, and quiet opportunities to experience the Settlement is the limiting attribute that most constrains the Settlement's ability to accommodate visitor use. The Settlement area is particularly sensitive to crowding which can prevent these contemplative opportunities because visitors largely want to visit the same small location—the First African Baptist Church. This one-room structure can only accommodate a handful of visitors before crowding begins to impinge on those contemplative opportunities. Protection of the integrity of the historic church also constrains the ability of the Settlement to accommodate visitation, as large volumes of foot traffic through the church each day would begin to affect its structural integrity and historic fabric.

To preserve opportunities for contemplative, passive, and quiet opportunities to experience the First African Baptist Church and protect its historic integrity, it is necessary to consider use both from an

at-one-time and from a daily use perspective. The at-one-time perspective will ensure contemplative experiences are possible, while the daily use perspective will ensure overall cumulative use does not adversely affect the church over time.

To assess the number of people that can be both inside and around the First African Baptist Church at one time, the planning team referred to the 2012 study of visitor preferences for the number of people per view since the 2019 study did not evaluate the acceptability of the number of people at the First African Baptist Church. The 2012 study found that visitors that stopped at the church as a part of an overnight wilderness trip identified nine people per view as the minimal acceptable condition, while day use visitors identified 12 people per view as minimally acceptable.

Visitor Capacity — Given that day-use visitors arriving by van have different preferences and expectations than overnight users that arrive by foot, the planning team decided to identify a capacity that both would generally find acceptable, or at least not cause their displacement. Therefore, the visitor capacity is identified after understanding both wilderness users' minimal acceptable condition of no more than nine people per view inside and outside the church and day users' minimal acceptable condition of 12 people per view inside and outside the church. Given the relatively small size of this area, a "view" can reasonably be interpreted to include all visitors inside the church or all visitors in the immediate vicinity around the church.

Since the experience inside the church is the priority experience in the area, the visitor capacity is identified using the more constraining number of 9 people per view, so the visitor capacity inside the church is nine people at one time. Outside the church, where the experience is not as much of a priority, the visitor capacity is identified using the less constraining number of 12 people, so the visitor capacity outside the church is 12 people at one time. While this capacity is above what Wilderness visitors reported to be minimally acceptable, it is below the 14 people at one time they reported would cause them not to visit. Having the capacity outside the church identified as 12 people at one time will also avoid the operational challenge that would be presented if the number of people at one time outside the church was less than the number that often arrive on a given van. It should also be noted that the comparison of the 2012 and 2019 studies available at the other sites indicates visitors generally become increasingly tolerant of higher visitation levels over time. It is likely that if the 2019 study had evaluated wilderness visitor preferences at the First African Baptist Church, it would have found that their minimally acceptable condition was greater than nine, and likely closer to 12.

The resulting visitor capacity is identified as 9 people at one time inside the church, and 12 people at one time in the immediate vicinity, or viewshed, around the church. Applying the same logic and visitor preferences, the visitor capacity for the remainder of the Settlement is identified as 12 people at one time, bringing the total visitor capacity of the Settlement to 33 people at one time.

As mentioned above, to ensure the continued protection of the First African Baptist Church, an essential part of one of the fundamental resources of the park, it is necessary to think about use levels from a daily use perspective as well as an at-one-time perspective. The Cumberland Island Wilderness Boundary Adjustment Act of 2004 requires that Cumberland Island provide up to eight opportunities for tours of the northern portion of the island. These Lands and Legacies tour vans have seats for 12 people. This means that the legislated capacity is at least 96 people per day. As noted above, wilderness users and the guests of private properties also visit the Settlement, which would mean even more than 96 visitors to the church in a day. However, park staff have noted that Lands and Legacies tour opportunities are rarely, if ever, filled to capacity, and it is much more common to have three or fewer tours in a day. Therefore, identifying a visitor capacity near the legislated capacity would still allow for these Wilderness users and the guests of private properties to visit. Therefore, the planning team has identified the daily visitor capacity for the Settlement as no

more than 100 people per day. Anecdotally, the planning team believes the current use levels are below both the 100 people per day and 33 people at one time capacities.

Wilderness

Analysis Area and Introduction — The northern portion of Cumberland Island includes nearly 10,000 acres of designated Wilderness and 10,710 acres of potential wilderness. This capacity analysis is for the designated Wilderness as the potential Wilderness is predominantly inaccessible salt marsh that cannot accommodate any significant visitor use. Use of the Wilderness area is primarily by overnight backpackers. Given the Wilderness boundaries, visitors on roads or beaches are outside of this analysis area.

Existing Direction and Knowledge — Wilderness users include visitors on overnight backpacking trips who camp in the Wilderness or in the primitive Stafford Beach and Hunt Camp campgrounds located just outside the Wilderness boundary. Some day-users find their way into the Wilderness after taking the ferry to Sea Camp or Dungeness, docking a private boat at Plum Orchard, arriving from one of the private inholdings, or by some other means. Under the preferred alternative, some visitors may access the Wilderness by taking the ferry directly to Plum Orchard.

Desired conditions for visitor experiences of the park (see chapter 2) articulate that the park provides an uncrowded setting with opportunities for passive and active outdoor recreation. Specifically, Wilderness is a fundamental resource of the park (Foundation Document, 2014). The Foundation Document notes that Cumberland Island's Wilderness is exceptionally large for a barrier island, that "its deep, lush forest and untamed atmosphere offer outstanding opportunities for solitude and inspired recreation," and that "low visitation helps maintain these qualities." In fact, Cumberland Island protects the largest designated wilderness area on an East Coast barrier island, providing visitors with a regionally unique opportunity to have wilderness experiences.

The Desired Conditions for the Wilderness Zone state that Wilderness provides opportunities for low-density experiences consistent with Wilderness values. Visitors should have the opportunity to experience solitude, remoteness, risk, challenge, and self-sufficiency. Visitors should have the opportunity to experience the primitive and undeveloped character of isolated areas and appreciate an environment ruled by natural forces. Natural resources and processes within this zone should remain largely unaltered by human activity.

During public comment in the spring of 2019, visitors clearly expressed how important NPS' continued protection of Wilderness values and experiences is to them (see Public Comment Summary Report, 2019). The island's large Wilderness area was foremost among the locations where NPS' continued protection of low-density experiences was emphasized.

Limiting Attribute — This protection of opportunities to experience solitude and other Wilderness qualities is the first limiting attribute that most constrains the Wilderness' ability to accommodate visitor use. The second limiting attribute is the permit availability in the Wilderness campsites. The addition of more campsites beyond those identified in the proposed action was considered by the planning team, but ultimately dismissed due to the adverse impact this would have on natural resources in the Wilderness (see chapter 3). These two limiting attributes relate directly to the visitor capacity on the trails (limiting attribute: experiences of solitude) and in campsites (limiting attribute: space in campsites).

Visitor Capacity — The indicator "number of people encountered on trails per day" serves as a starting point to identify the on-trail visitor capacity, which is constrained by opportunity for experiences of solitude on the trails. The threshold for this indicator is that 90% of visitors will encounter no more than four groups (defined as six people or less) on trails in the Wilderness per

day. The average Wilderness backpacking trip is 21 miles in length and lasts about 3.3 days (Brownlee et al., 2019). This means that, for the duration of their trip that includes distance both inside and outside of Wilderness, backpackers cover just under 6.5 miles per day on average, with just over half (54%) of that distance on trails (Brownlee et al, 2019). However, GPS tracks indicate that during the portion of their trip when they are in Wilderness, most of their travel occurs on Wilderness trails (Brownlee et al, 2019). Therefore, it is reasonable to assume that for a "Wilderness hiking day," where the travel occurs mostly on Wilderness trails, the total distance travelled on those trails is about 6 miles per day. The same distance travelled on Wilderness trails will be assumed for Wilderness day hikers, as no data has been collected on this relatively small user group's hiking behavior.

Since hikers typically travel about 1.5 miles per hour, trail users spend about four hours per day on the trails.

6 miles per day/1.5 miles per hour = 4 hours per day on trails

Since the trail users are on the trails for about four hours, and the threshold dictates that they should encounter no more than four groups in a day, they should, on average, encounter no more than one group per hour.

4 hours per day on trails/4 groups encountered per day = 1 group encountered per hour

This means that at any single point in time, there can be no more than one group every 1.5 miles to ensure the threshold is not violated (it is assumed that half the hikers are going in one direction on the trail and half are headed the other direction). Since there are about 34 miles of trail, this means about 23 groups, or up to 138 people, can be hiking on trails in the Wilderness at one time without violating the encounter rate threshold.

34 miles of trail/1.5 miles between each group = 23 groups (138 people) at one time

This capacity only addresses people actively hiking on the trails at one time. It does not address people in a Wilderness campsite, as they will be addressed below, or on the north beach or Settlement areas, as they are addressed in other analysis areas.

It is worth remembering here that the on-trail visitor capacity for the Wilderness is the maximum amount of use the trails can accommodate while achieving desired conditions. The visitor capacity identification assumes that each of the trails are used with equal frequency, and that groups are evenly distributed across those trails. In reality, these conditions are unlikely to exist (just as it is unlikely that all 23 groups are composed of six people, as the current average group size is 2.65). As emphasized above, the protection of opportunities to experience solitude is incredibly important, and this will be best protected through monitoring of the encounter rate indicator. Since it is unknown how changes in visitor arrival to the island may impact current visitor use patterns, it is especially important to monitor the encounter rate indicator. If encounter rates exceed the established threshold, action will be taken as described in appendix A. While this concept is true of all visitor capacities identified in this analysis, it is particularly relevant in wilderness.

The second limiting attribute that constrains the wilderness' ability to accommodate visitor use is the amount of overnight backcountry use that can occur without the development of additional campsites. Allowing overnight visitor use beyond what the designated campsites can accommodate would inevitably lead to the creation of user-created campsites and trails, which would also adversely impact natural resources in the Wilderness. Campsites in the wilderness consist of a small cleared space and access to a well. This limiting attribute relates directly to the overnight permit availability in the wilderness.

Under the proposed action, there would be a total of 12 permits available (3 permits each at Brickhill Bluff, Hickory Hill, Toonahowie, and Sweetwater Lakes). The number of people allowed under each permit is six due to the available space at the campsites and the desire to manage for a less social, lower density experience at each of the campsites. Therefore, the capacity for the Wilderness campsites is 72 people at one time.

12 permits per night x 6 people per permit = 72 people

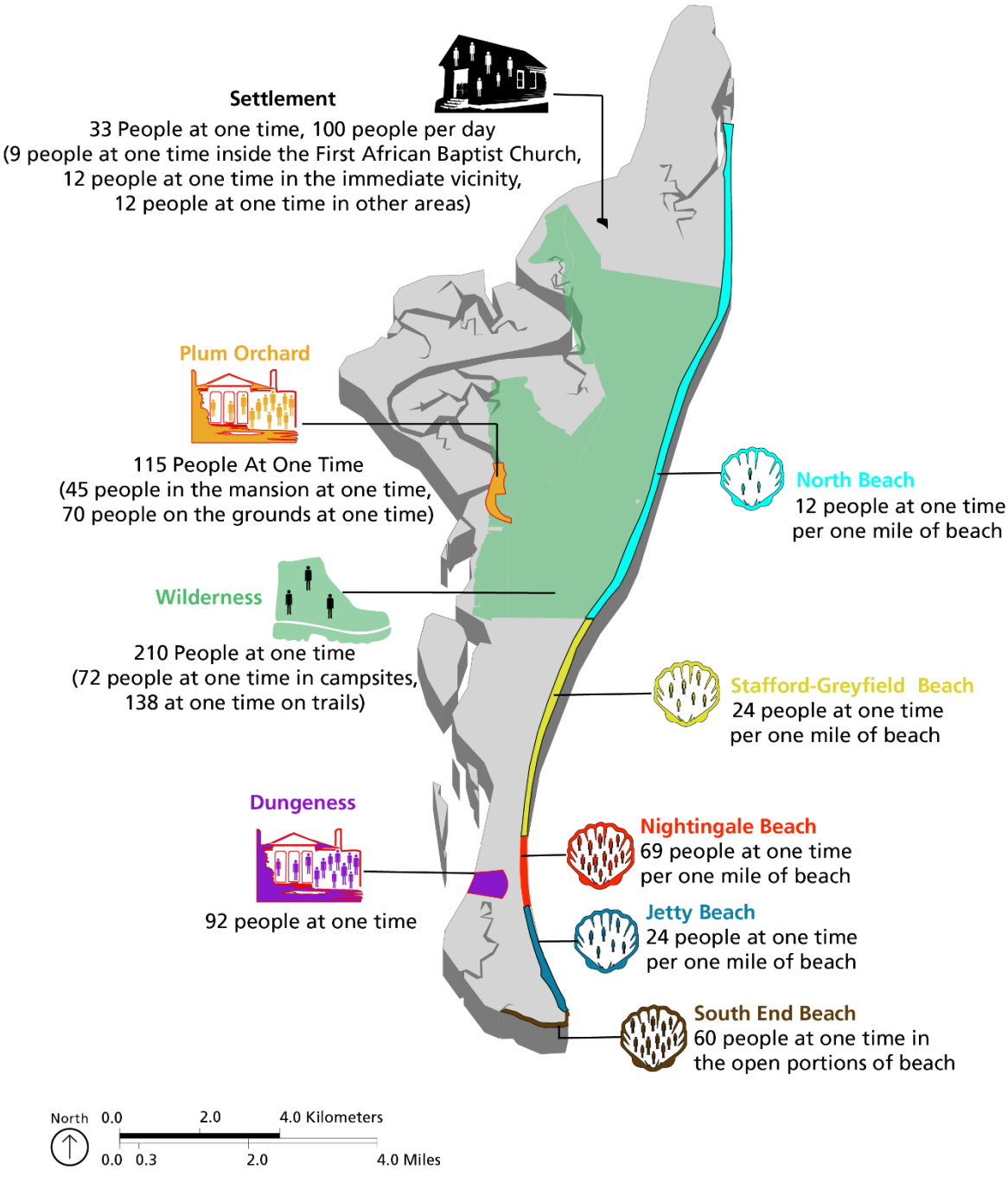
A total of 210 people at one time has been identified as the visitor capacity for the Wilderness by summing the maximums of 72 people at one time in the campsites 138 people at one time on the hiking trails.

Commercial Allocation. The commercial allocation for this area has been identified at no more than 15% of annual overnight use. This number would provide for some commercial use of overnight wilderness permits, while also protecting access for independent users. Appendix F: Extent Necessary Determination includes a detailed analysis of potential commercial visitor services in the wilderness areas.

Summary of Visitor Capacity at Key Locations

The following figure shows the visitor capacities identified for each of the key locations.

Cumberland Island National Seashore
Visitor Capacity at Key Locations



Visitor Capacity at Other Locations

The table below shows the visitor capacities identified for additional locations at Cumberland Island National Seashore.

TABLE B-2. VISITOR CAPACITY SUMMARY FOR OTHER LOCATIONS

Analysis Area	Review of Existing Direction and Knowledge	Limiting Attribute(s)	Identified Visitor Capacity
Sea Camp Campground	Under the proposed action, there would be 19 individual campsites and 2 group campsites. Of the 19 family sites, 4 are closed at any given time to allow campsites to recover. Each of the 15 individual sites that are available for use can accommodate 6 people. The 2 group sites can accommodate 20 people per site. Visitors may stay up to 7 days in the campground, though, 2-3 days is the average.	Additional visitation beyond what is proposed in this location would change the nature of the primitive and undeveloped character (a park Fundamental Resource and Value) in this location. Adding additional sites without additional impacts to vegetation would result in reduced privacy in the campground. The additional camping capacity included in the proposed action is accomplished by converting existing administrative sites to publicly available sites.	148 people/night 90 visitors in individual sites/night, 40 visitors in group sites/night, 18 users in administrative sites/night
Dungeness Dock	This is one of two primary docks where most day use visitors arrive on and/or depart from the island. Use at this location varies widely throughout the day and is closely tied to the ferry arrival and departure schedule. As part of the Development Zone, desired conditions articulate that visitors will have opportunities for higher-density visitor experiences and that visitor services and facilities are appropriate. Desired conditions include serving visitor needs.	Desired conditions describe, and visitors expect and tolerate, high levels of use in the debarkation points at the Dungeness dock, Resource protection is not of great concern in this location as it is largely developed to withstand high levels of visitation. Therefore, the limiting attribute at this location is the number of people that may be arriving and departing the island at the dock at one time while maintaining desired conditions at other key destinations on the island, such as at Nightingale Beach.	200 people at one time
Sea Camp Dock	This is one of two primary docks where most day use visitors arrive on and/or depart from the island. Use at this location varies widely throughout the day and is closely tied to the ferry arrival and departure schedule. As part of the Development Zone, desired conditions articulate that visitors will	Desired conditions describe, and visitors expect and tolerate, high levels of use in the debarkation points at the Sea Camp dock, Resource protection is not of great concern in this location as it is largely developed to withstand high levels of visitation. Therefore, the limiting attribute at this location is the	200 people at one time

Analysis Area	Review of Existing Direction and Knowledge	Limiting Attribute(s)	Identified Visitor Capacity
	have opportunities for higher-density visitor experiences and that visitor services and facilities are appropriate. Desired conditions include serving visitor needs.	number of people that may be arriving and departing the island at the dock at one time while maintaining desired conditions at other key destinations on the island, such as at Nightingale Beach.	
Stafford Campground	There are 10 campsites in this location. At any given time 6 are in use (and 4 are closed for recovery). These sites accommodate up to 6 people.	Additional visitation beyond what is proposed in this location would change the nature of the primitive and undeveloped character (a park Fundamental Resource and Value) in this location. Adding additional sites without additional impacts to vegetation would result in reduced privacy in the campground.	36 people/night
Stafford/ Little Greyfield Area	This area is mostly used as a pass-through area to reach other destinations on the island (such as Plum Orchard or Stafford Campground). 17% of visitors access this area (Peterson, Brownlee, Sharp, 2016).	High encounter rates on trails detract from quality visitor experiences in this area. An acceptable encounter rate would be about 8 groups of 6 people on trails per day. This is double the acceptable encounter rate for locations in the Wilderness.	12 people at one time
Hunt Camp	This area is used as a camp for registered hunters participating in managed hunts. Under the proposed action, it could be used by the public when not in use for administrative purposes. Reservations would be available for 3 parties of up to 6 people on any given night.	The camping experience at Hunt Camp when the camp is not being used by the hunters should be similar to the character experience in other backcountry campsites.	18 people/night
Beach Creek Campsites	Under the proposed action, the backcountry campsites at Beach Creek would consist of three small cleared spaces and a well. The sites would be accessible by non-motorized and/or small motorized watercraft or by trail. Reservations would	The camping should be similar to the character experience in other backcountry campsites.	18 people/night

Analysis Area	Review of Existing Direction and Knowledge	Limiting Attribute(s)	Identified Visitor Capacity
	be available for 3 parties of up to 6 people on any given night.		
Beach Creek	Beach Creek is used by recreational boaters and anglers. It would serve as an access to the Beach Creek campsite.	High levels of use could impact wildlife in this area. It would also detract from the experience of campers at the Beach Creek Campsite.	20 motorized boats/day and 20 non-motorized boats/day
Southern Uplands	This area does not currently receive much use as visitors tend to stick to the Jetty Beach or Grange areas (Peterson, Brownlee, and Sharp, 2016). A trail along the Southern Uplands would be designated.	High encounter rates on trails would distract from quality visitor experiences in this area. An acceptable encounter rate would be about 8 groups of 6 people on trails per day. This is double the acceptable encounter rate for Wilderness.	12 people at one time
Mainland Museum	The museum sees on average of 35 visitors per day. Currently the museum is open from 1 to 4 p.m. daily.	Crowded conditions within the museum make it challenging for visitors to enjoy exhibits. However, the museum does accommodate school classrooms that are sometimes up to 35 children in size.	35 people at one time
Mainland Visitor Center	The primary visitor center for Cumberland Island is on the mainland in St. Marys, Georgia. All ferry-based day-use visitors pass through this visitor center. Currently the Visitor Center receives 125 people per day during the year, and about 225 people per day during the period from March through July.	Crowded conditions within the visitor center make it challenging for visitors to enjoy exhibits and access resources provided in this facility. While the fire code is 198 people maximum, ferry check-ins indicate that no more than 50 people need to be in the facility at one time, which would be more protective of visitor experience conditions in the visitor center.	50 people at one time

REFERENCES

Brownlee, Sharp, Blacketer, Nettles, and Perry

2019 Evaluation of the Relationship Between Current Conditions, Travel Patterns, Visitor Thresholds, and Ferry Services at Cumberland Island National Seashore.

Hallo, Manning, Brownlee, and Smith

2012 Cumberland Island National Seashore Visitor Use Study 2010-2011.

Ike, A.F. & J. I. Richardson

1975 Estimating Carrying Capacity for Cumberland Island National Seashore. University of Georgia.

Interagency Visitor Use Management Council

2016 Visitor Use Management Framework: A Guide to Providing Sustainable Outdoor Recreation. Edition One.

2019 Visitor Capacity Guidebook: Managing the Amounts and Types of Visitor Use to Achieve Desired Conditions. Edition One.

National Park Service

1984 Cumberland Island National Seashore General Management Plan (GMP)

2014 Cumberland Island National Seashore Foundation Document

2019 Public Comment Summary Report: Draft Strategies. Cumberland Island National Seashore Visitor Use Management Plan. (On file at the park).

2019 Cumberland Island National Seashore. Data Collection during summer 2019.

Peterson, Brownlee, and Sharp

2016 Understanding Visitor Use at Cumberland Island National Seashore.

APPENDIX C: DAILY FERRY DELIVERY TECHNICAL REPORT

INTRODUCTION

One of the objectives of this VUM plan was to evaluate the approximate number of visitors that the ferry could deliver to the island while protecting and maintaining the desired conditions for experiences and resources. The actions, visitor capacities, and monitoring framework already described in this plan provide important tools to ensure conditions on the island are consistent with established desired conditions. This technical report complements the management strategies described in the management alternatives (chapter 3), indicators and thresholds (appendix A), and the visitor capacity analysis (appendix B) by providing an estimate of roughly how many passengers the ferry service could deliver to Cumberland Island per day, while maintaining and protecting the desired experiences and resource conditions of the park.

Based on the results of the analysis in this technical report as described below, the park may increase daily ferry delivery to the island from current levels without adversely impacting desired conditions, exceeding thresholds, or exceeding visitor capacities. This report estimates that the ferry could deliver approximately 600 people per day to the Dungeness and Sea Camp docks combined as the key threshold of 23 people per view at Nightingale Beach will likely be approached when daily ferry delivery is at that level. In addition to the 600 people delivered to the Sea Camp and Dungeness area, this report estimates that 100 people per day could be delivered directly to Plum Orchard if ferry service to that location is established under the Preferred Alternative. This would likely ensure the key threshold of 4 groups encountered per day on trails in the Wilderness would not be exceeded.

The estimated number of visitors that could be delivered to Sea Camp and Dungeness docks and achieve desired conditions was calculated by developing a statistical model of the relationship between daily ferry delivery and people per view at Nightingale Beach. This statistical model is based on the current understanding of the relationship between daily ferry delivery and visitor use patterns. If these visitor use patterns change, this relationship would likely change as well. Due to this potential for changing patterns, any increase in daily ferry delivery would be implemented in an incremental fashion in keeping with sound adaptive management. That is, as increasing numbers of visitors are delivered to the island by ferry, continued monitoring of the key indicators (the people per viewshed indicator at Nightingale Beach and the encounter rate indicator in Wilderness) would occur. These measures of actual conditions at key destinations would inform whether further increases would be consistent with the identified thresholds and visitor capacities. In other words, visitation at these two key destinations on the island would be monitored to ensure desired conditions are maintained over time. If monitoring reveals that the key thresholds are being reached or exceeded, park staff would work with the concessioner to make changes to the amount, timing, and spatial distribution of ferry delivery to the island. Each of these aspects of ferry delivery could be adjusted independently or concurrently to ensure desired conditions are maintained.

CURRENT CONDITIONS: HOW VISITORS ACCESS CUMBERLAND ISLAND

Cumberland Island is approximately seven miles by boat from St. Marys, Georgia. By legislation, no road or causeway connecting the island to the mainland is to be constructed. Cumberland Island is accessible only by private boat or concession-operated passenger ferry. The passenger ferry runs from the St. Mary's visitor center on the mainland of Georgia to docks at Dungeness and Sea Camp on the island. Visitors seeking private transportation may charter a boat with the approved concessionaire or use personal boats. Day use docking is available at the north end of both Dungeness and Sea Camp docks, and some public dock space is available at Plum Orchard. Few spaces are available in all these locations, and the slips are on a first-come, first-served basis and are

not actively managed. Visitors are asked to deposit an entrance fee in collection boxes upon arrival at the docks or pay ahead of time on Pay.gov. No overnight docking is permitted.

This technical report is concerned primarily with the passenger ferry as this is the primary mode of access to the island for most visitors and the mode of access that the park most actively manages. The park's general management plan states that about 300 people will visit the island each day. In practice, this number has been used to determine the daily ferry delivery to the island (see appendix B for a more thorough discussion). An NPS concessioner runs the passenger ferry that departs from St. Marys to transport visitors to the island on a 45-minute ride to the Dungeness or Sea Camp docks on the western shore of Cumberland Island. The ferry transports up to 150 people on each trip and does not transport motorized vehicles to the island. The passenger ferry schedule varies throughout the year. From March 1st to November 30th, two daily round trips are made departing St. Marys at 9:00 a.m. and 11:45 a.m. and departing Cumberland Island at 10:15 a.m. and 4:45 p.m. From December 1st to February 28th, the ferry keeps the same departure and arrival times with no ferry service on Tuesdays or Wednesdays. From March 1st to September 30th, there is an additional departure from Cumberland Island at 2:45 p.m., Wednesday through Saturday.

DESIRED CONDITIONS FOR VISITOR ACCESS AND EXPERIENCE

The goals of the VUM plan are to enhance recreational opportunities for key visitor experiences and minimize impacts to resources and visitor experiences caused by visitor use. As part of this plan, the park identified desired conditions for resources and experiences of the park (see chapter 2 in the VUM Plan for a comprehensive list of the desired conditions for the park related to visitor use and visitor experience).

The visitor experience desired conditions that apply parkwide are "Cumberland Island National Seashore provides an uncrowded setting that provides opportunities for passive and active outdoor recreation. Visitor access to the island is managed to maintain a setting that is consistent with the values for which the unit was established." This desired condition is an expression of what the NPS is managing for in order to protect an "Uncrowded setting that provides opportunities for both passive and active outdoor recreation", which is a fundamental value of the park (Foundation Document 2014).

FERRY DELIVERY AT SEA CAMP AND DUNGENESS DOCKS

The iterative practice of monitoring, implementing potential management strategies, and then continuing to monitor to gauge the effectiveness of those actions allows park managers to maximize benefits for visitors, while achieving and maintaining desired conditions for resources and visitor experiences in a dynamic setting. This adaptive management approach provides managers with flexibility to achieve desired conditions without over-prescribing a specific management strategy or course of action.

To inform this planning effort, a range of social science studies and analyses were completed to understand visitor preferences. In 2012, a study was conducted to assess the social norms and expectations of visitors regarding crowding at a range of locations on Cumberland Island including Dungeness Ruins and Nightingale Beach (Hallo et al 2012). In 2019, researchers repeated the 2012 study. Results from the 2019 study showed that social norms had shifted slightly, and that visitors surveyed in 2019 were slightly more tolerant of higher use conditions (Brownlee et al 2019).

In a 2016 study of day use patterns on the island, researchers found a dominant travel pattern that was consistent across seasons. This travel pattern has visitors departing from Dungeness Dock, going to Dungeness Ruins first, to the Nightingale Beach area second, and ending at Sea Camp Dock. Approximately 91% of day visitors traveling on foot go to Dungeness Ruins and 68% of visitors go to

the Nightingale beach area near Dungeness crossing (Peterson, Brownlee and Sharp 2016). Given this ratio of day visitors at these sites, the number of visitors on the ferry are closely correlated with the number of people per view at Dungeness Ruins and the number of people per view at Nightingale Beach. Due to the relative ease of monitoring, the importance of conditions on the beach to the purpose and fundamental resources and values of the park, and the fact that it is the more constraining than Dungeness Ruins, park managers have elected to monitor a people per viewscape indicator at Nightingale Beach.

Also in the 2019 study, researchers used four statistical models to analyze the strength and significance of the relationship between the number of people who were delivered to the island via the ferry service and the experiential conditions at Nightingale Beach. To assess the relationship between ferry service and people at the site, researchers plotted observations of people per view (Observed PPV) at Nightingale Beach against the total number of people delivered by ferry that same day with a superimposed regression line. This linear regression analysis showed that the relationship between these two variables is statistically significant (Brownlee et al 2019) and provides a measure of predictability between how many people are delivered via the ferry service and how many people may be present at Nightingale Beach. However, this analysis also shows that there is some degree of variability in this relationship, meaning that it cannot be predicted with absolute certainty. This means that the park will need to monitor the key people per view at Nightingale Beach indicator as described in appendix A to ensure that desired conditions are maintained over time.

To calculate the forecasted number of ferry passengers that can be accommodated without violating the threshold (23 PPV at Nightingale Beach), two steps were followed.

Step 1: Identify the statistical relationship between the number of ferry passengers arriving on the island and the number of visitors observed on the beach, after an appropriate lag time. This relationship was identified using a regression equation using observations of the maximum people per view (Observed PPV – dependent variable) on the beach, and the total number of people delivered by ferry that same day (Total FP – independent variable). Two inputs were used in the regression equation below: The dependent variable and the independent variable. The intercept and coefficient can be thought of as the outputs that are generated from the regression procedure.

Inputs

- Observed PPV: Dependent variable – maximum visitors within view at Nightingale Beach at one time for each day derived from 2019 camera data.
- Total FP: Independent variable - the total number of people arriving on the island by the ferry between 9 am and 1 pm for each day.

Outputs

- Intercept: The intercept, also referred to as the constant, is not generally used during results interpretation but can be considered the value of the dependent variable (Observed PPV) when the value of the independent variable (Total FP) is 0. However, the intercept value is extrapolated from the equation below, contains some degree of error, and is not considered an observed variable.
- Coefficient: The regression coefficient is the change in the dependent variable (Observed PPV) for every one unit increase in the independent variable (Total FP).

Step 2: Use the intercept and coefficient values from the regression equation described above to identify the number of total ferry passengers that could be delivered per day without exceeding the PPV threshold at Nightingale Beach by inserting the threshold of 23 people per view as the dependent variable in the regression equation and solving for Total FP. This process answered the question: At what number of ferry passengers arriving between 9:00 a.m. and 1:00 p.m. will the threshold for people per view at Nightingale Beach (23) be reached on the same day?

Regression Equation

Dependent Variable = Intercept + Coefficient x Independent Variable
Max Observed PPV per day = Intercept + Coefficient x Total FP per day
Max Observed PPV per day = 2.2 + 0.036 x Total FP per day

Prediction Equation

Dependent Variable = Intercept + Coefficient x Independent Variable
Threshold PPV = Intercept + Coefficient x Total FP
23 = 2.2 + 0.036 x Total FP
23-2.2= 0.036 x Total FP
(23-2.2) ÷ 0.036 = Total FP
20.8 ÷ 0.036 = Total FP
577.8 = Total FP
578 = Total FP

Interpretation

The regression equation indicates that there may be approximately two people at Nightingale Beach on days when no passengers ride the ferry, which in part may represent visitors who arrived on private vessels or overnight visitors that arrived on previous days. The coefficient suggests that for each additional passenger on the ferry, another 0.036 people per view at Nightingale Beach can be expected. Although '0.036 people' is not possible, the regression coefficient suggests that not everyone traveling on the ferry is observed at Nightingale Beach at one time. The prediction equation suggests that the ferry could deliver about 578 people per day and stay within the threshold of 23 people per view (figure C-1).

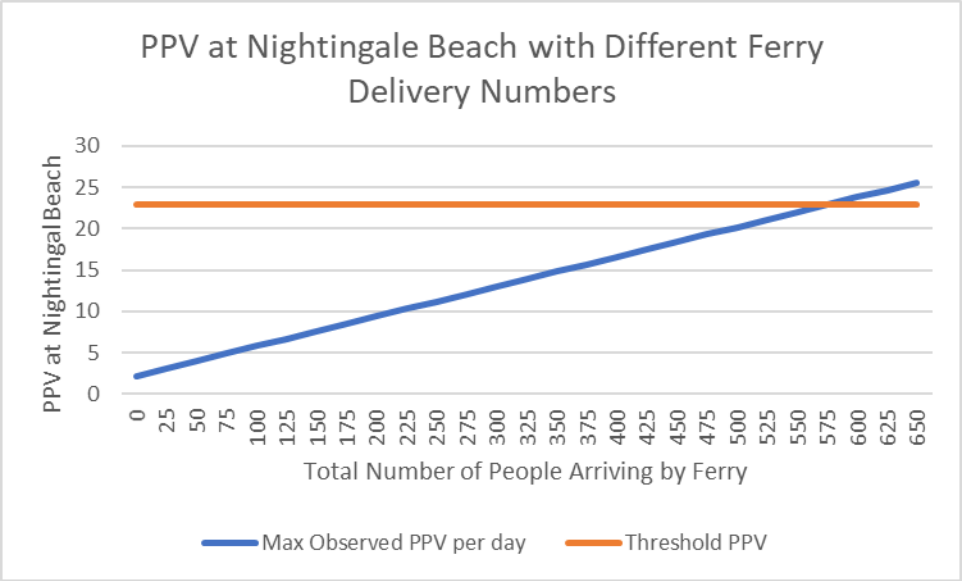


Figure C-1. People Per View at Nightingale Beach under Different Ferry Delivery Numbers

Limitations

It is important to note that error exists in the regression model and the prediction model. This error stems from four primary sources: 1) survey data responses, 2) camera data observations, 3) fit or congruency of the models and associated statistics, and 4) the approximation of photographs to represent actual conditions. Perhaps most important to recognize is that the level of variability in this estimation itself; the best fitting regression model accounted for approximately 31% of the variance in PAOT at Nightingale Beach. This means that a portion of the variability in PAOT at this location is not accounted for by the number of passengers on the ferry. This incongruence is likely attributed to differences in temporal and spatial travel patterns of visitors due to a host of personal (e.g., level of fitness), experiential (e.g., time spent viewing wildlife), and environmental factors (e.g., weather). Another consideration is that this estimate is reliant on one independent variable: The number of ferry passengers per day delivered to the island. Other factors may likely influence PAOT at Nightingale Beach, such as campers from Sea Camp campground, occupants from Greyfield Inn, or individuals with estates on the island visiting the beach. A final caveat is that during the study period all visitors disembarked and loaded the ferry at Sea Camp Dock, since Dungeness Dock was under repair due to hurricane damage.

Regardless of these limitations the model reveals that the number of people on the ferry can be used to predict observed PPV at Nightingale Beach.

Summary

This analysis is based on existing conditions (Summers 2017 and 2018), use levels, and patterns. Planned actions, such as changes in ferry delivery times that may spread visitor use throughout the day and add options for a shorter duration trip, the use of smaller ferries to decrease the "pulsing effect" of visitor travel patterns, and the addition of facilities that may slightly alter the travel pattern along the Dungeness to Sea Camp route would change these conditions. Given these likely changes in visitor use patterns that are intended to spread people out, and given the potential error in the statistical model, the 578 people derived from the equation is rounded to 600 for planning purposes.

FERRY DELIVERY AT PLUM ORCHARD

The relationship between daily ferry delivery to Plum Orchard and observed impacts on thresholds and visitor capacities in the northern section of the park is not as well understood as the Sea Camp-Dungeness-Nightingale relationship since ferry service to Plum Orchard currently does not exist and therefore was not included in the 2019 study.

There is one key threshold in the vicinity, namely the number of people encountered on trails per day in designated wilderness (no more than four groups of 6 people or fewer encountered per day). Relevant visitor capacities in the vicinity include 115 PAOT at and in Plum Orchard, 33 PAOT and 100 PPD at the Settlement, and 12 PAOT per mile of the North Beach.

Due to its close proximity to the dock, it is reasonable to assume all of those who ride the ferry on a given day may congregate at Plum Orchard at one time. Therefore, a working hypothesis of approximately 100 people per day delivered by ferry to Plum Orchard can be assumed. Upon assuming this daily ferry delivery, the ability to achieve desired conditions in the northern section of the island can be tested by looking at other relevant thresholds and visitor capacities in the area.

At the North Beach, the 12 PAOT per mile visitor capacity can by translated to 4 PPV. See appendix B for a discussion of the PAOT to PPV relationship. While the visitor use pattern at Sea Camp-Dungeness-Nightingale Beach is likely different from a hypothetical Plum Orchard-North Beach pattern, a similar linear regression logic to Nightingale Beach can be applied using 4 PPV as the Dependent Variable, 1 as a reasonable intercept for the remote wilderness-adjacent beach (see appendix B for a discussion of existing direction and knowledge for North Beach), and the same 0.036 coefficient (4=1 + 0.036 x Total Plum Orchard Ferry People). Solving the equation for the Independent Variable, in this case Ferry Delivery to Plum, reveals that when 83 people ride the ferry to Plum Orchard, the visitor capacity of 12 people at one time per mile of beach would be reached. However, this assumes that a similar ratio of visitors would be willing to make the hike between Plum Orchard dock and North Beach (a round trip distance of roughly 5 miles) as make the trek to Nightingale Beach (only a one-mile round trip from the nearest dock). Assuming this greater hiking distance dissuades even a modest proportion of ferry passengers who ride to Plum Orchard from hiking across the island to the beach, the coefficient for a theoretical Plum Orchard-North Beach regression model would be lower than 0.036, meaning a daily ferry delivery of 100 is likely protective of the North Beach visitor capacity.

In the Wilderness, the visitor capacity on trails is 138 people at one time. Under a scenario where ferry service directly to Plum Orchard is provided, most people on those trails would either be overnight Wilderness backpackers or day users utilizing the Plum Orchard ferry. Given the number of available overnight permits for the Wilderness, there may be up to 72 Wilderness backpackers in the Wilderness at one time. This means up to 66 of the 100 Plum Orchard ferry passengers could be in the Wilderness at one time without exceeding the visitor capacity of 138. Given the alternative destinations for Plum Orchard ferry passengers (Plum Orchard mansion, Settlement, North Beach), it is reasonable to assume that no more than two-thirds of the 100 ferry passengers would be in the Wilderness at one time. As the four groups per day encounter rate threshold for Wilderness is the limiting attribute for the people on trails in Wilderness visitor capacity (see appendix B), it is reasonable to assume that use would remain below the threshold with 100 ferry passengers to Plum Orchard per day. However, due to possible sources of error in these assumptions monitoring of actual conditions via the encounter rates in Wilderness indicator is important to ensure conditions remain within an acceptable range (see Visitor Capacity Analysis for the Wilderness for further discussion). For this reason, the encounter rates in Wilderness indicator is considered a “key indicator” that is a priority for monitoring to inform ferry delivery.

Additionally, daily ferry delivery of 100 people would likely be protective of the 33 PAOT and 100 PPD capacities at the Settlement as not all ferry passengers would go to the remote destination at once given other destinations in the vicinity, and all daily ferry passengers would have to go the Settlement at some point during the day to reach daily capacity.

As the 100 people per day ferry delivery to Plum Orchard would likely be protective of the key indicator and all relevant visitor capacities in the area, it is carried forward for planning purposes.

ADAPTIVE MANAGEMENT AND CONCESSIONER OPERATIONS

The number of people delivered to the island by ferry each day will be managed incrementally and adaptively as needed. As the plan is implemented and additional visitors are delivered to the island each day, two key indicators (PPV at Nightingale Beach and encounter rates in wilderness) will be monitored. If conditions approach their respective thresholds, park managers may adjust the amount of visitors that should be delivered via the ferry in specific places and/or at specific times to ensure that desired conditions continue to be met at these key locations.

Future actions may include changes to the amount, timing, and spatial distribution of ferry delivery to Cumberland Island including, but not limited to:

- Modifying the total number of visitors delivered to the island each day,
- Modifying the number of people who disembark at each dock location,
- Increasing the number of drop off times and/or using smaller vessels to potentially deliver a smaller number of visitors during each drop off time,
- Increasing the number of drop off locations (i.e., Plum Orchard) to spread visitor use across the island,
- Only dropping off at one location or the other based on time of day.

Any and all of these elements of ferry delivery could be adjusted in the future based on what is learned during the monitoring process. They could also be adjusted on a seasonal basis. Adjustments would be made in concert with monitoring efforts to ensure desired conditions are achieved. Aspects of ferry delivery would not be adjusted simply because of increases in visitor demand, but rather to ensure resource protection and optimize visitor opportunities by managing within resource and experience thresholds (see appendix A).

In order to ensure park managers have the flexibility to adapt aspects of ferry delivery to effectively achieve desired conditions on the island, the prospectus for the next ferry concession contract will define adaptive ferry management strategies and define when and how they will be applied while ensuring a reasonable opportunity for profit. This prospectus will be informed by a financial analysis. During development of the financial analysis and prospectus, NPS will consider the following elements and include them in the process as appropriate:

- That management of ferry delivery is anticipated to be adaptive in nature, informed by monitoring of indicators and subject to adaptive NPS decisions regarding the amount, timing, and spatial distribution of ferry delivery.
- That NPS will work with the concessioner to ensure the concessioner has enough advance notice of changes to ferry delivery to avoid needing to cancel or change advanced reservations (for example, the prospectus may define a 6 -month or 12-month notice window). This could include discussion of ferry delivery changes as part of an annual operating plan review.

- The anticipated minimum level of NPS-approved daily ferry delivery (recognizing that actual ridership may be less than NPS-approved daily ferry delivery). This minimum level could be determined by the minimum level deemed to be financially viable by the financial analysis or at the current level of NPS-approved ferry delivery (300 people per day). This would define the "worst case" scenario or "floor" from a concessioner's business perspective and allow for a predictable business opportunity.
- The anticipated maximum level of NPS-approved daily ferry delivery expected during the life of the contract (i.e., 600 people per day delivered to Sea Camp and Dungeness with an additional 100 people per day delivered to Plum Orchard). This maximum level would define a "best case" scenario or "ceiling" from a concessioner's business perspective and allow for a predictable business opportunity.
- A tiered franchise fee (based on ridership) and/or ferry rate adjustments corresponding to changes in service (for example, as ferry delivery numbers increase and concessioner profit margins increase accordingly, the NPS franchise fee percentage may increase and/or the price charged to ferry passengers may change to reflect a new set of comparables offering services more in line with the concessioner's adjusted services).
- That NPS will consider other costs associated with increasing or decreasing operations (e.g., dock maintenance) within the context of a tiered franchise fee or ferry rate adjustments.

CONCLUSION

The park is managing to desired conditions (chapter 2) and the thresholds associated with those desired conditions (appendix A). Ferry delivery is a tool to provide access to the park while remaining within identified thresholds and therefore maintaining desired conditions. This analysis indicates that the park may increase ferry access to the island without compromising desired resource or experiential conditions. This analysis indicates that a ferry delivery of approximately 600 people per day to Sea Camp and Dungeness docks combined would be protective of desired conditions in that area of the park, specifically the sensitive 23 PPV threshold at Nightingale Beach. This analysis also indicates that a ferry delivery of approximately 100 people per day to Plum Orchard dock would be protective of desired conditions in that area, including the sensitive threshold of four groups encountered per day in the Wilderness and visitor capacities at Plum Orchard, North Beach, the Wilderness, and the Settlement. These analyses are built on assumptions about visitor use patterns, complex statistical relationships, and in the case of Plum Orchard, a hypothetical scenario that does not currently exist. Therefore, active monitoring of the two key indicators (PPV at Nightingale Beach and encounter rates in wilderness) is essential. Continued monitoring will track the relationship between ferry delivery and observed conditions in relation to acceptable conditions, allowing managers to implement adaptive management strategies, if necessary, to ensure desired conditions are maintained. Adjustments to ferry delivery may be made if monitoring reveals that different numbers, timing, or destinations would better achieve desired conditions and maintain identified thresholds and visitor capacities. Park staff will work with the concession ferry operator to make these adjustments.

APPENDIX D: COMPILED MONITORING ACTIVITIES

The following monitoring activities are included in the plan:

Monitoring Activity	Source
Number of people entering posted closures (temporary or permanent) of sensitive shorebird areas.	Appendix A: Indicators and Thresholds
Number of People Per Viewshed at Nightingale Beach	Appendix A: Indicators and Thresholds
Number of people encountered on trails per day in designated wilderness	Appendix A: Indicators and Thresholds
Continued monitoring of the beach for nesting American oystercatcher pairs, least tern colonies, and other species of concern.	Chapter 3: Mitigation Measures
Continuation of the annual sea turtle nest monitoring and protection project to maintain records of disturbances to nest sites.	Chapter 3: Mitigation Measures

This page intentionally left blank.

APPENDIX E: COMMERCIAL VISITOR SERVICES ANALYSIS

NECESSARY AND APPROPRIATE DETERMINATION: AN ANALYSIS TO INFORM THE ROLE OF COMMERCIAL VISITOR SERVICES AT CUMBERLAND ISLAND NATIONAL SEASHORE

The National Park Service (NPS) is authorized by specific laws, regulations, and policies to allow commercial visitor services, leasing, and special park uses within areas under the NPS's jurisdiction. A summary of the requirements the National Park Service must meet for each of these authorities follows.

Management Policies

The National Park Service was established in 1916 through the National Park Service Organic Act. Safeguarding resources became a primary concern for the National Park Service and has been balanced with the need to provide visitor services to ensure public enjoyment and recreation. It is from this original law that the NPS Commercial Service Program evolved.

The National Park Service Concessions Management Improvement Act of 1998 describes that "the development of public accommodations, facilities, and services in units of the national park system shall be limited to those accommodations, facilities, and services that are necessary and appropriate for public use and enjoyment of the unit of the national park system in which they are located." Necessary and appropriate criteria help parks determine which commercial services can enhance the visitor experience while not negatively impacting the park and its ability to carry out its mission. They allow a park to easily identify which services can be considered for a Commercial Use Authorization or a concession contract.

To implement requirements by law, the National Park Service has a set of policies that guide agency operations. These policies are an indispensable tool to help NPS employees manage parks responsibly and make rational, well-informed decisions. Chapter 10 of NPS Management Policies 2006 provides management guidance specific to commercial visitor services. "The National Park Service will provide, through the use of concession contracts, commercial visitor services within the parks that are necessary and appropriate for visitor use and enjoyment. Concession operations will be consistent with the protection of park resources and values and demonstrate sound environmental management and stewardship." (NPS Management Policies 2006, Chapter 10).

As a part of this visitor use management plan for Cumberland Island National Seashore, the appropriate role of commercial operators in helping parks to provide opportunities for visitor services is analyzed and identified. Commercial visitor services, through concession contracts or commercial use authorizations, must be consistent to the highest degree practicable with the preservation and conservation of park resources and values. Commercial visitor services have been evaluated to determine whether or not they are appropriate and necessary, utilizing the guidance of NPS concession management laws, regulations, and policies.

Overview of National Park Service Commercial Visitor Services

Commercial services are defined as any activity or service that occurs in a park for which compensation is made. By law, all commercial services must be authorized in writing by the park superintendent. The two most common mechanisms for delivering commercial services are concessions contracts and Commercial Use Authorizations (CUAs). Commercial use authorizations are permits authorizing appropriate commercial services to park visitors. Concession contracts are typically 10-year agreements for larger commercial activities, granted after a competitive solicitation

process. There are three different types of concession contracts based on the amount of land or facilities assigned to the concessioner. Commercial service providers that do not operate under a NPS concessions contract must have a valid CUA to legally operate in a national park.

Necessary and Appropriate Criteria

Necessary and appropriate criteria help parks determine which commercial services will enhance the visitor experience without negatively impacting the park or its ability to carry out its mission. They allow a park to easily identify which services can be considered for a commercial use authorization or a concession contract.

Appropriate criteria help to answer the question, "Can the park authorize this service without compromising the reason it is a unit of the National Park System?" These criteria provide insight into the critical components of the park and visitor service, while also describing the potential negative impacts of commercial services the park must prevent. All commercial services—whether a CUA or concession contract—must meet all appropriate criteria to operate in the park. Services that meet all appropriate criteria could be authorized as a CUA, however the park is not obligated to seek or approve commercial visitor services for these categories.

Appropriate Criteria

A service that is appropriate accomplishes all of the following:

- It is consistent with the park purpose and significance
- It is consistent with laws, regulations and policies
- It does not compromise public health and safety
- It does not cause unacceptable impacts to park resources or values
- It does not unduly conflict with other park uses and activities
- It does not exclude the general public from participating in recreational opportunities

Necessary criteria help to answer the question, "Why is this service important for the park?" These criteria describe how a commercial service could enhance the visitor experience and further the goals and mission of the park. Necessary criteria are unique to NPS concession contracts - while CUAs do not need to meet any necessary criteria, concession contracts must meet at least one necessary criterion to operate in the park.

Necessary Criteria

A service that is necessary accomplishes one or more of the following:

- Contributes to visitor understanding and appreciation of a park's purpose and significance
- Enhances visitor experiences consistent with the park's purpose and significance
- Assists the NPS in managing visitor use and educating park visitors
- Provides an essential service or facility not available within a reasonable distance from the park

Commercial services authorized in Cumberland Island National Seashore will be consistent with the preservation and conservation of resources and values of the park, and will be necessary and appropriate for public use and enjoyment. Necessary and appropriate criteria will assist park staff in

making sound business decisions when planning for and evaluating future commercial services within the park.

Commercial Services in Wilderness

The Wilderness Act of 1964, Section 4 (d)(6) states that "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas." Commercial services in wilderness also must fulfill the broader purpose of the wilderness act, which is to protect and enhance wilderness character, and avoid prohibited uses except as necessary for the administration of the area. The "Extent Necessary Determination" in appendix F addresses the analysis required by law for commercial services in wilderness.

Existing Management Guidance

In addition to law and policy, park management principles aid the administration and protection of the park's resources. These principles set broad boundaries for the types of commercial activities that may occur within the park.

The management guidance is drawn from the park's General Management Plan (1984), the Transportation Management Plan (2009), the Foundation Document (2014), and the Long Range Interpretive Plan (2017). To operate in the park, commercial visitor services must be consistent with the purpose for which the park was established, have minimal impacts on the park's resources and values, and must be consistent with the zone descriptions. The park's purpose and fundamental resources and values are described below, and the updated zoning descriptions for the park may be found in chapter 2 of the VUM plan. The enabling legislation (1972) and the GMP identify and provide guidance on the number of concessions that may be operated at Cumberland Island National Seashore to maintain its primitive state.

The purpose of Cumberland Island National Seashore is to maintain the primitive, undeveloped character of one of the largest and most ecologically diverse barrier islands on the Atlantic coast, while preserving scenic, scientific, and historical values and providing outstanding opportunities for outdoor recreation and solitude.

Evaluation of Commercial Services / Visitor Services Opportunities

The following evaluation of Cumberland Island National Seashore's current commercial visitor services and potential new services are based on an analysis of relevant laws and policies as well as input from park staff. All commercial visitor services need to be consistent with the zoning for which the activity or service will take place, can be accommodated within visitor capacities (appendix B) and do not cause indicators to approach thresholds (appendix A).

Existing Commercial Services.

Current Concessions Contract — The sole park concessioner, Lang's Seafood, Inc., operates the passenger ferry to and from Cumberland Island and provides other services. These commercial visitor services contribute to visitor understanding and appreciation of the park's purpose and significance, enhance visitor experience, and assist park staff in managing and educating park visitors. The current concession contract is in effect until 2025. These services meet the necessary and appropriate criteria, and can be authorized under the concession contract authority of the Concessions Management Improvement Act of 1998 (PL 105-391, Section 418).

Required Visitor Services — The current concessioner is required to provide the following services for the public during the terms of the current contract:

Passenger Ferry Service between St. Marys and Cumberland Island: The ferry schedule varies based on seasonal demand but generally consists of two trips each way between the mainland and Cumberland Island, with island stops at both Sea Camp and Dungeness Docks. The ferry service allows visitors to access the park and enjoy opportunities for outdoor recreation and solitude, therefore meeting the park's purpose and the first appropriate criteria. In addition, it aligns with the park's enabling legislation. The ferry service provides a safe mode of transportation for visitors to access the island from St. Mary's, Georgia and does not cause unacceptable impacts to the park's resources and values. The ferry is required to be ADA compliant, have space and equipment on board for selling food and beverages, and must have space to transport a minimum of ten bicycles. The service provides visitors a chance to access the island to engage in the many opportunities presented at the park, and therefore does not cause conflict with other park uses and allows the public to engage in recreational activities. The service meets all of the appropriate criteria and contributes to visitor experience and understanding, enhances their experience by providing safe and facilitated access, assists in managing visitor use and education, and provides an essential service that is otherwise not available to the general public in the area thereby meeting the necessary criteria. Because the island is only accessible by boat, this service is vital as it provides the fundamental access to the park by the general public. Without it, they would not be able to experience the park and enjoy the opportunities it offers.

Charter Service between St. Marys and Plum Orchard Dock: The current concessioner is required to provide this service for hunters and their equipment six times per year. The park's enabling legislation mandated that hunting shall be permitted on Cumberland Island (PL 92-536). Currently, the park annually supports six public hunts held between October and January. The hunts are managed in accordance with State of Georgia and federal regulations. Charter service to support those hunts meets all of the appropriate criteria. The service is necessary to assist the park in safely and administratively managing the hunts by concentrating hunter access.

Cart Rental: The current concessioner is required to provide this service on the island at Sea Camp. Carts are not permitted north of the Sea Camp area. Cart rentals enable those who do not have their own cart the ability to transport camping gear to the Sea Camp Campground. Sea Camp is a modestly developed campground that provides the amenities of a frontcountry, tent camping experience. Visitors accustomed to that sort of experience have types and amount of gear that are not conducive to being hauled significant distances, particularly if small children and/or mobility impairments are involved. The campground is 0.4 miles from the ferry dock at Sea Camp and may require multiple trips without cart assistance. Cart rental accomplishes all of the appropriate criteria as well as the necessary definition by enhancing the experience for visitors and for families of young children, or those who need particular amenities to ensure an enjoyable night in the woods. It also ensures visitor health and safety by minimizing potential injuries because of falls and strains.

Lands and Legacies Tour: These tours were legally mandated by the Cumberland Island Wilderness Boundary Adjustment Act of 2004 (PL 108-447) to transport visitors to and from historic sites no more than eight or less than five times per day. That legislation states that trips are to be made available daily on the Main Road north of the Plum Orchard Spur and the North Cut Road by the National Park Service or a concessioner for the purpose of transporting visitors to and from the historic sites located adjacent to Wilderness. The service is operated in accordance with the park's 2009 *North End Access and Transportation Management Plan and Environmental Assessment*. The tour is approximately 5 to 6 hours and operates up to three times per day from Sea Camp Ranger Station for visitors arriving on the 9 a.m. ferry service or those who have camped on the island.

Authorized Visitor Services — The concessioner is authorized but not required to provide the following services:

Limited Food and Beverage on ferry: Ice, firewood, bug spray, snacks, and drinks, are currently sold on the ferry. This service is consistent with all appropriate criteria. In addition, despite abundant messaging about the lack of services on the island, many visitors board the ferry unprepared with items that are important to their stay, whether it be a day trip or overnight camping. Providing these items on the ferry enhances their experience and in some cases supports their health and safety. Moreover, these items are not available within a reasonable distance because, as previously stated, these services are not available on the island. For those reasons limited food and beverage items are considered a necessary service.

Passenger ferry service between St. Marys and Plum Orchard Dock two times per month: Currently, this service is rarely offered except for special occasions or programs. However, the service meets all of the appropriate criteria. In its current status and/or with renewed activities it meets the necessary criteria as it provides visitor access to a primary historic feature of the island. The well preserved mansion is the best representation of the island's Carnegie era and contributes to the visitor understanding and appreciation of the park's purpose.

Bicycle Rental: Under the Superintendent's Compendium, bicycle use is permitted on all public roads and parking areas, and on the beach between Dungeness and Sea Camp Beach Crossings; they are not allowed on trails. Bicycle use is prohibited in the Cumberland Island Wilderness Area; private residents who possess pre-existing rights to drive vehicles in the wilderness may operate bicycles on the designated road system. The concessioner is authorized to provide bicycle rentals at Sea Camp Campground. Bike rentals provide visitors a way to explore the island and cover more geography than if they walked. It provides an open-air enjoyment of the resource that maintains freedom of choice and challenges by choice, therefore enhancing a visitor's experience and contributing to one's appreciation of island resources. Therefore, bike rental is determined to meet the necessary and appropriate criteria

Charter service to Cumberland Island from St. Marys, Georgia and Fernandina Beach, Florida: A charter service is available to support group visitation and/or activities such as school groups, weddings, and other private groups. Such groups may not be able to be accommodated by the regular ferry service due to space availability or scheduling restrictions. The service is consistent with all appropriate criteria. With respect to the necessary criteria, it contributes to visitor understanding and appreciation of the park by providing access to the island for large groups, particularly youths participating in school or civic activities.

Water Taxi service between St. Marys, Georgia and Fernandina Beach, Florida: This water taxi does not currently operate. It is intended for transporting visitors from Fernandina Beach, a popular tourist destination, to St. Marys so that they can access the concessioner ferry to Cumberland Island. There is no authorized ferry service for the general public from Fernandina Beach directly to Cumberland Island and therefore, the water taxi is necessary to provide a connecting service that is not available within a reasonable distance.

Current Commercial Use Authorizations. As of 2019, Cumberland Island National Seashore had eight commercial use authorizations (CUAs) that expire in 2022. Activities allowed under the CUAs include hiking, kayaking, walking tours, and camping. Each of the CUAs operated as out-of-park agreements.

*Day-use Education Program*s: Curriculum-based educational experiences are provided for youth to learn the significance of park resources, the threats to resources, and the means to protect them.

Programs are generally concentrated in the Dungeness and Sea Camp area and cover both the natural environment and cultural heritage of the island. These programs comply with all of the appropriate criteria for a commercial visitor service. In addition, they meet the necessary criteria by contributing to visitor understanding and appreciation of the park's purpose and significance, enhancing the visitor experience, and assisting the NPS in educating park visitors.

Guided Walking/Hiking Tours: These tours originate and terminate outside of the park and generally access the island via the concessioner's charter or regular ferry service. They may be part of a larger package tour through the region or support school field trips. Sites visited on the island include the Dungeness and Sea Camp areas as well as the adjacent beach. The service is consistent with all of the appropriate criteria. It is also meets one of the necessary rationale as guided tours enhance the visitors' experience and contribute to their understanding and appreciation of the park's purpose and significance.

Guided Non-motorized Boat Tours: These tours originate and end outside of the park and generally involve kayaks. They may be day or overnight trips and include hiking, camping, and/or photography on the island. Camping is only allowed in the park's designated campsites and requires visitors to reserve a site through Recreation.gov. These tours are consistent with all of the appropriate criteria. In addition, such trips enhance the visitor experience by providing a challenging adventure while at the same time expanding their understanding and appreciation of park resources that may not be attainable or apparent through other means of access. Therefore, the service fits one of the necessary criteria.

Guided Motorized Boat Tours: These tours originate and end outside of the park and are largely based out of Fernandina Beach, Florida. Vessels consist of small boats and personal watercraft, and may hold up to 80 passengers. A number of these businesses operate on the waters and tidal creeks within the park boundary without a commercial use authorizations (CUA). Operators are not allowed to transport visitors to and from Cumberland Island. With a proper CUA these tours meet the appropriate criteria. They satisfy the necessary criteria by contributing to visitor understanding and appreciation of the park's purpose and significance.

Special Events: These events have included commercial businesses, civic organizations, non-profits, government agencies, and other groups. Activities have included interpretive and informational tours of the island, educational lectures, organizational meetings, food service, entertainment, camping, and, in the future, potential overnight stays in park housing facilities. Events are largely confined to the Dungeness - Sea Camp area of the island but, some elements such as tours may extend to other parts of the park. The programs have been authorized under Commercial Use Authorizations. The Park has provided direct or indirect support at times. Events are evaluated through the CUA and/or Special Use Permit process to ensure they comply with all of the appropriate criteria. Because these events are not explicitly tied to the park's purpose and significance they may not satisfy any one of the necessary criteria.

Other Authorized Services — Cumberland Island also partners with America's National Parks (formerly known as Eastern National), a non-profit cooperating association that supports interpretive, educational, and scientific programs at national park units. The association provides services on the mainland of St. Marys at Cumberland Island's visitor center, where visitors may purchase books, videos, and related items. *Bookstore on Mainland:* Service is currently provided by authorized cooperating association America's National Parks on the mainland at the park visitor center. The store operates during visitor center hours. Items available include books, maps, apparel, and postcards as well as memorabilia and gear related to Cumberland Island National Seashore and the national parks. The association may only sell items within the park's "Scope of Sales" and cannot sell commercial items unless they are safety related (e.g., water, bug spray, sunscreen). This service is

consistent with all of the appropriate criteria. It also supports visitor understanding and appreciation of the park's purpose and understanding by providing relevant reading materials. In addition, it enhances the visitor experience by providing items that will provide a lasting memory of their time on the island. For these reasons this service meets the necessary criteria.

South-end-only Shuttle Service: This service was authorized in the 2009 *North End Access and Transportation Management Plan and Environmental Assessment*. According to that plan, this service would provide access to multiple destinations at the southern end of the island. No beach driving tours would be allowed as part of the service. The south end shuttle service would provide access to the beach at Dungeness Crossing, with the Stafford or Little Greyfield crossings used as alternate access points in the event of high water or other safety issues preventing reasonable access at Dungeness. The shuttle would likely be a single vehicle on an unscheduled route through the various points of interest on the south end.

In its current form, the shuttle operates depending on the availability of a park volunteer or guide. It is a multi-passenger cart that makes the rounds between Sea Camp, the Dungeness Historic District, and the ferry docks. It is an important service during hot and humid periods when the health and safety of visitors may be at risk. The service is consistent with all appropriate criteria and is necessary in assisting management of visitors, particularly in mitigating risks to health and safety.

Potential New Commercial Visitor Services. The addition of new commercial visitor services would provide a variety of new visitor experiences and support the park in resource protection, visitor education, visitor safety, and managing visitor access. These services were considered and evaluated against the necessary and appropriate criteria.

Services that meet all appropriate criteria could be authorized as a commercial use authorization (CUA). However, the park is not obligated to seek or approve commercial services for these categories. In addition, those services that meet at least one of the necessary criteria could also be managed under the concession contract authority if demand supports a reasonable business opportunity. To test the demand for these new services, the park may solicit applications for CUAs for the specific commercial activity. Based on the interest in these business opportunities, performance of CUA holder, visitor experience and financial viability, the park could authorize the activity under the concession contract authority in the future. The evaluated commercial services include:

Camp Store on Cumberland Island: While a store provides some services on the mainland, time constraints and timelines of mainland operations are not always conducive for visitors' accessibility to and appreciation for these materials. Items available on the island would be similar to but not necessarily to the full extent of those sold by the cooperating association on the mainland and may include: books and other reading material, postcards, maps, etc. In addition, the store could sell health, safety, and essential camping items such as matches, stove fuel, water purification, water bottles, ropes, tarps, sunscreen, bug spray, ice, firewood, tent stakes, ponchos, and prepackaged essential food items, etc. Visitors, particularly campers, often forget, lose, break, or run out of these items during their visit. These services comply with all the appropriate criteria, support visitor understanding and appreciation of the park, and support visitor health and safety. For these reasons this service meets the necessary criteria.

This service is consistent with all appropriate criteria. It satisfies the necessary criteria by enhancing the visitor experience through the provision of items that are important, and in some cases necessary to protect health and safety. In addition, while some of these items can be purchased from the concessioner ferry, there is nowhere on the island to acquire them once the ferry departs. This service could possibly be incorporated with the potential bookstore described above.

Residential Education Program (Managed Overnight Experiences): This service would provide overnight education experiences focused on the park's interpretive themes and would utilize park housing units, campgrounds, and other infrastructure. Education would focus on the significance of park resources, the threats to resources, and the means to protect them. Current CUA's encompass day-use programs while the proposed activity would allow an overnight component that would expand opportunities for a more in-depth, comprehensive experience. This service complies with all appropriate criteria. In addition, it would contribute to visitors' understanding and appreciation of the park's purpose and significance and would provide an enhanced, memorable experience. Therefore, the proposed service satisfies necessary criteria.

Non-Motorized Boat Rental on Island: Examples of non-motorized boats include, but are not limited to, kayaks and canoes. This service would depart and return to an island-based facility. Visitors would be able to recreate in and experience the park's tidal sound, rivers, and tidal creeks that are otherwise not accessible. The boats would also provide a conveyance to some of the island's more distant points. Rentals would generally be hourly or daily with the potential for overnight use to further explore the island. While non-motorized boat rental is available on the mainland, the distance and tidal currents make kayaking/canoeing to the island a significant challenge for the typical visitor. This service complies with all of the appropriate criteria. It would also satisfy necessary criteria by contributing to the visitor understanding and appreciation of the island as well as enhance their overall experience.

Non-Motorized Boat Tours on Island: This service would depart from and return to an island based facility. Tours would be hourly and/or half-day ventures with a guide through the sound, rivers, and tidal creeks that are otherwise not accessible. The skilled guide would provide interpretation of the island's resources, ensure safety and resource protection, and instruct the clients. This service complies with all of the appropriate criteria. It would also satisfy necessary criteria by contributing to the visitor understanding and appreciation of the island, enhancing visitors' overall experience, and assisting the NPS in educating visitors. It would provide them exposure to important resources and ecosystems that they may not encounter at any other time during a visit to the island.

Motorized Boat Tours – Island Based: This service would depart from and return to an island based facility. The boats would be markedly smaller in size than the passenger ferry, such that they can navigate shallower, narrower water bodies and support a quality experience. The tours would be sightseeing and/or ecological in nature through the sound, rivers, and tidal creeks of the park. The proposed service would be compliant with all appropriate criteria. In addition, it would satisfy several of the necessary criteria: contributing to visitor understanding and appreciation of the park's purpose and significance, enhancing the visitors' experience, and assisting the NPS in educating visitors. It would provide them exposure to important resources and ecosystems that they may not encounter at any other time during a visit to the island.

Vehicle Based Tours: Ferry service is concentrated on the south end of the island and vehicle transportation is not provided on the island. Thus, visitor access is confined to a small portion of the island that can be reached on foot, and is particularly constrained for day-use visitors. Because of this they are not able to experience many of the island's resources. The proposed guided tours would provide access to these sites with the Plum Orchard mansion and grounds a primary destination with other stops between the south end and Plum. The service would be an alternative to the current, more in-depth Lands & Legacies Tour. The tours would comply with all appropriate criteria. They would meet several necessary criteria including contribution to visitor understanding and appreciation of park resources not normally accessible, enhancement of the visitor experience, and assistance in educating visitors.

Art and Photography Tours/Classes: While the park would likely not initiate these programs, it is possible that commercial entities may seek such opportunities through a commercial use authorization. These recreational and educational activities would access the island via the concessioner's ferry or charter service and would concentrate on the southern area of the island. This service would comply with all of the appropriate criteria. However, the primary focus of the service would be on the artistic activity and not strictly the park's purpose or significance. Therefore, the service does not firmly accomplish any of the necessary criteria.

Guided Fishing: The Park would not initiate this service. However, such services are currently available based out of Camden and Glynn Counties in Georgia and Fernandina Beach, Florida. It is reasonable to expect that these outfits may choose to fish in waters within the park's boundaries. Commercial Use Authorizations would be appropriate for this recreational service. This service would comply with all of the appropriate criteria. However, the primary focus of the service would be on fishing and not strictly the park's purpose or significance. Therefore, the service does not firmly accomplish any of the necessary criteria.

Inappropriate Commercial Visitor Services. Additional commercial services were given consideration. However, due to various reasons they were either deferred to a future planning effort, which would include public involvement, or the services were dismissed altogether without further evaluation. Those services include:

Deferred - Horseback Riding and/or Carriage Rides: While this commercial service satisfies most of the appropriate criteria, a conflict within the park suggests that this service may compromise public health and safety. There has been at least one known incident between the island's feral horses and a horse pulling a carriage. This incident (involving private residents) had the potential for serious injury to passengers and horses as well as damage to property and resources. There are also frequent conflicts between feral horse bands and it is expected that such conflicts would carry over between feral and domestic stock. Currently, the feral horse population is unrestrained and has free range over the island. To ensure safety and resource protection, full consideration of horseback riding and carriage rides cannot be done until a feral horse management plan is developed. Such a plan would potentially include a solution that would allow riding programs that are safe for human participants and the domestic stock. Until then, the National Park Service has determined that horseback riding and/or carriage rides does not meet all the criteria for "necessary and/or appropriate" as described in the "Necessary and Appropriate Criteria" section.

Dismissed - Motorized Boat Rental on Island: Small boat and personal watercraft rentals are already available in nearby Fernandina Beach, Florida and elsewhere in Southeast Georgia and Northeast Florida. Boats rented from these locations have the same capability to reach areas of Cumberland Island that any service initiated from an island-based service would. The Park does not see the need or the logistical feasibility to support motorized boat rentals on the island. the National Park Service has determined that motorized boat rental on the island does not meet all the criteria for "necessary and/or appropriate" as described in the "Necessary and Appropriate Criteria" section.

Dismissed - Food and Beverage – Mainland: Sandwiches, snack foods, salads, side items, and drinks. There are numerous private entities that already provide this service within walking distance of the St. Marys Visitor Center and ferry dock. The National Park Service has determined that provision of food and beverage on the mainland does not meet all the criteria for "necessary and/or appropriate" as described in the "Necessary and Appropriate Criteria" section.

Dismissed - Food and Beverage on Island: Sandwiches, salads, side items, snack foods, and drinks provided by a merchant or vending machines. Although food and beverage service may enhance the visitors' experience by meeting basic needs, providing such visitor services may also generate

significant waste, attract animals such as raccoons, and cause visitor health and safety concerns. In addition, trash and waste may cause unacceptable impacts to natural resources such as endangered species and their habitat. Because of the above-mentioned concerns, the National Park Service has determined that provision of food and beverage on the island does not meet all the criteria for "necessary and/or appropriate" as described in the "Necessary and Appropriate Criteria" section.

The following tables summarize the commercial services considered and evaluated against the necessary and appropriate criteria.

TABLE D-1. EVALUATION OF CURRENT COMMERCIAL SERVICES BY APPROPRIATE AND NECESSARY CRITERIA

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Ferry Service: St. Marys – Cumberland Island	Yes	Yes
Charter Service: St. Marys and Plum Orchard Dock	Yes	Yes
Cart Rental	Yes	Yes
Lands and Legacies Tour	Yes	Yes
Bicycle Rental	Yes	Yes
Limited Food and Beverage on ferry	Yes	Yes
Passenger ferry service: St. Marys - Plum Orchard Dock, twice per month	Yes	Yes
Charter service to Cumberland Island from St. Marys, Georgia and Fernandina Beach, Florida	Yes	Yes
Water Taxi service between St. Marys, Georgia and Fernandina Beach, Florida	Yes	Yes
Day-use Education Programs	Yes	Yes
Guided Walking/Hiking Tours	Yes	Yes
Guided Non-motorized Boat Tours	Yes	Yes
Guided Motorized Boat Tours	Yes	Yes
Special Events	Yes	No
Bookstore on Mainland	Yes	Yes
South-end-only Shuttle Service	Yes	Yes

TABLE D-2. EVALUATION OF POTENTIAL COMMERCIAL SERVICES BY APPROPRIATE AND NECESSARY CRITERIA

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Camp Store on Island	Yes	Yes
Managed overnight educational program	Yes	Yes
Non-motorized Boat Rental on Island	Yes	Yes
Non-motorized Boat Tours on Island	Yes	Yes
Vehicle Tours	Yes	Yes
Motorized Boat Tours on Island	Yes	Yes
Art and Photography Tours/Classes	Yes	No
Guided Fishing	Yes	No

TABLE D-3. EVALUATION OF DEFERRED / DISMISSED COMMERCIAL SERVICES BY APPROPRIATE AND NECESSARY CRITERIA

Activity	Meet ALL Appropriate Criteria	Meet AT LEAST ONE Necessary Criteria
Horseback Riding	No, future reconsideration	No, future reconsideration
Motorized Boat Rental on Island	No	No
Food and Beverage - Mainland	No	No
Food and Beverage - Island	No	No

APPENDIX F: EXTENT NECESSARY DETERMINATION FOR COMMERCIAL SERVICES IN THE CUMBERLAND ISLAND WILDERNESS

INTRODUCTION

The purpose of this document is to determine the extent to which commercial services are necessary in the Cumberland Island Wilderness to realize the purposes for which the Cumberland Island Wilderness was established.

The assessment begins with a review of law, policy and regulation to bring forth the criteria that will be used to measure the extent that commercial services are both necessary and appropriate in Cumberland Island Wilderness. Following a listing of these criteria, descriptions of the wilderness characteristics relative to the criteria are presented. This determination then identifies those activities that are necessary and proper for realizing the recreational and other authorized purposes of wilderness.

Commercial services to support proper activities are evaluated in terms of their ability to preserve wilderness character and achieve desired conditions for wilderness. Finally, any other agency-specific analyses or requirements relative to wilderness planning and commercial services are also added to this decision-making process. The assessment concludes with a finding of the amount of commercial services that is necessary and may be provided.

THE WILDERNESS ACT AND NPS WILDERNESS POLICIES

The Wilderness Act of 1964 secured for our nation an enduring resource of wilderness. Wilderness areas included in the National Wilderness Preservation System are to be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness. The wilderness character of these areas is to be preserved.

To achieve these goals, the Wilderness Act includes a series of prohibitions related to particular activities. These prohibitions relate to mining, road construction, motorized equipment, landing of aircraft, installation of structures, and commercial services. With regard to commercial services in wilderness, Section 4(d)(5) of the Wilderness Act states, "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas." The "purposes" referred to in Section 4(d)(5) are those purposes enumerated in Section 4(b). Section 4(b) provides that "...wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."

In addition to the Wilderness Act, the NPS's management of wilderness areas is guided by the NPS *Management Policies 2006* (§6.4.4) and Director's Order # 41. The Management Policies state that commercial services like guiding that "…contribute to public education and visitor enjoyment of wilderness values or provide opportunities for primitive and unconfined types of recreation may be authorized if they meet the "necessary and appropriate" tests of the National Park Service Concessions Management Improvement Act of 1998 and section 4(d)(5) of the Wilderness Act…, and if they are consistent with the wilderness management objectives contained in the park's wilderness stewardship plan, including the application of the minimum requirement concept." The application of the "minimum requirement" concept to commercial services is reemphasized in Director's Order 41. Director's Order 41 requires NPS to prepare a documented determination setting forth the types and amounts of commercial services that are necessary to realize wilderness purposes. This Extent Necessary Determination satisfies the requirement in Director's Order 41.

The Director's Order also provides that allocations between commercial and non-commercial uses should be subject to public comment through a public planning process.

Definitions of Wilderness Act Terms

The Wilderness Act does not define the terms "activities," "commercial services," or "necessary." When Congress does not include definitions of important terms in a statute, agencies may rely on commonly accepted definitions.

The word "activities" is commonly defined as, "a pursuit in which a person is active"[3], "a recreational pursuit or pastime", or "actions taken by a group in order to achieve their aims."[4] In the wilderness context, it is understood as referring to the recreational or other active pursuits engaged in by wilderness visitors.

The word "commercial" is commonly defined as (1) "[o]f or relating to commerce," i.e., "[t]he buying and selling of goods, esp. on a large scale: business," (2) "[e]ngaged in commerce," (3) "[i]nvolved in work designed or planned for the mass market," or (4) [h]aving profit as a primary aim."[5]

The word "service" is commonly defined as "the organized system of apparatus, appliances, employees, etc., for supplying some accommodation required by the public" or "the performance of any duties or work for another." For the purposes of this document, a commercial service is one that relates to or is connected with commerce wherein work is performed for another person or entity, and where the primary purpose is the experience of wilderness through support provided for a fee or charge and where the primary effect is that the wilderness experience is guided and shaped through the use of support services provided for a fee or charge.

The word "necessary" is defined in some dictionaries as meaning "absolutely needed."[6] Other dictionaries define it to mean "important in order to achieve a specific result, or desired by authority or convention."[7] The word necessary appears in many federal statutes. For the purposes of this Extent Necessary Determination, the word necessary in relation to commercial services is defined to mean a service that is needed to achieve objectives for visitor use and enjoyment of wilderness in such a manner that the desired conditions for wilderness area are achieved, and wilderness character is preserved.

The language of the Act also contains two distinct but interrelated standards related to the terms "activities" and "commercial services." First, the "activities" that may be supported by commercial services must be "proper for realizing the recreational or other wilderness purposes." Second, "commercial services" can only be authorized "to the extent" that they are necessary for activities deemed proper. The U.S. Court of Appeals for the Ninth Circuit has concluded that this language requires agencies to make a specialized finding of necessity for commercial services and to determine the minimum amount of commercial use that can be allowed. Thus, both the type (i.e., "proper") and

[3] Merriam-Webster's (online)
[4] Oxford Dictionary (online)
[5] Webster's II New College Dictionary 225 (1995); accord Merriam-Webster's Collegiate Dictionary 230 (2000). See Wilderness Society v. U.S. Fish and Wildlife Service, 353 F.3d. 1051, 1061 (9th Cir. 2003).
[6] Merriam-Webster's (online)
[7] Encarta Dictionary (online)

necessity and amount (i.e., "extent") of commercial support must be addressed in this Extent Necessary Determination.

The NPS Management Policies state that commercial services like guiding that

> "…contribute to public education and visitor enjoyment of wilderness values or provide opportunities for primitive and unconfined types of recreation may be authorized if they meet the "necessary and appropriate" tests of the National Park Service Concessions Management Improvement Act of 1998 and section 4(d)(6) of the Wilderness Act…"

A general outline of the necessary and appropriate standards are as follows:

Appropriate

A service that is appropriate accomplishes all of the following:

- It is consistent with the park purpose and significance
- It is consistent with laws, regulations, and policies
- It does not compromise public health and safety
- It does not cause unacceptable impacts to park resources or values
- It does not unduly conflict with other park uses and activities
- It does not exclude the general public from participating in recreational opportunities

Necessary

A service that is necessary accomplishes one or more of the following:

- Contributes to visitor understanding and appreciation of a park's purpose and significance
- Enhances visitor experiences consistent with the park's purpose and significance
- Assists the National Park Service in managing visitor use and educating park visitors
- Provides an essential service or facility not available within a reasonable distance from the park

A necessary and appropriate analysis for commercial visitor services at Cumberland Island National Seashore is located in appendix F.

Activities *Not* Considered Commercial Services

By way of illustration, the following activities known to have occurred historically in the Cumberland Island Wilderness are not considered "commercial services" for purposes of the Wilderness Act:

- Filming by journalists in conjunction with reported stories.
- Still photography that does not involve the use of models or props to promote a product or service. (The term "model" includes any person, animal, or object that serves as the subject of still photography for the purpose of promoting the sale or use of a product or service.) It is permissible for a person to take pictures in the wilderness, without use of models, and later sell those images, because the actions of this photographer are the same as any other visitor taking photos during their time in the wilderness. The concern of NPS is for the use of models in still photography to promote a product or service.

- Wilderness-dependent trips by accredited academic institutions that provide course credit for completion. Even if accompanied by a hired guide or instructor, these trips are not considered commercial services.

Relationship to the Visitor Use Management Plan

Guidance from Director's Order 41 indicates that an Extent Necessary Determination (END) should be undertaken as part of a larger planning effort. This section of the END is intended to explain the relationship between the END and the associated planning effort. Relevant guidance and information from the plan (e.g., carrying capacity information, desired conditions, visitor use management goals, plan alternatives) are discussed here.

This END is being prepared in conjunction with the Visitor Use Management Plan (VUM plan) for Cumberland Island National Seashore (CUIS). The END was prepared using an interdisciplinary approach that included wilderness management experts, commercial services staff, and other resource specialists. Through the process of preparing this END and the VUM plan, the NPS considered both the potential short-term and long-term effects of commercial service activities in wilderness. This END is an integral part of the VUM plan. The extent to which commercial services in the parks' wilderness were deemed necessary is an outcome of the overall VUM planning process. This process identified key elements of wilderness character, defined desired conditions and management objectives for these elements, analyzed impacts in determining the overall amount of use appropriate in wilderness, and finally determined the proportion of this use that may be supported by commercial visitor services while ensuring the preservation of wilderness character.

The framework for determining visitor capacity and the extent of commercial services necessary in the CUIS wilderness included the establishment of indicators and thresholds to identify and monitor visitor use and its effects on the condition of wilderness character. These indicators and thresholds are described in "Appendix A: Indicators and Thresholds."

The determination of the extent necessary for commercial services is closely related to the identification of visitor capacity, or the amounts of use appropriate in the wilderness. "Appendix B: Visitor Capacity Analysis" provides an explanation of visitor capacity and the amounts of visitor use that are considered in the VUM plan. Effective visitor use management ensures that wilderness character is preserved by mitigating change to important indicators of wilderness character. The present appendix provides further explanation of the process and outcomes of determining extent necessary for commercial services in wilderness.

As with other aspects of visitor use planning, an assessment of necessity for commercial services within each alternative is the outcome of a decision-making process and part of a larger management program. It requires judgment about the desired environmental and experiential conditions in, and effects on, wilderness. The NPS preferred alternative preserves wilderness character by emphasizing wilderness character qualities in different ways.

Resource conditions, management intensity, and visitor capacities—including the extent of support by commercial services—are foundational elements of the alternatives. The potential management options presented in chapter 2 represent choices for the kind of place the parks' wilderness will be and the experiences it will offer visitors to the wilderness in the future. All alternatives preserve wilderness character, as required by the Act, while offering a reasonable range of choices about the future of the wilderness as required by the National Environmental Policy Act (NEPA).

Purposes for which the Cumberland Island National Seashore Wilderness was Established

Section 4(d)(6) of the Wilderness Act states, "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the *recreational or other wilderness purposes of the areas*" (emphasis added.) Section 4(b) of the Act further provides that "...wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."

The Cumberland Island Wilderness was established in 1982. Neither the act establishing the wilderness nor the act's legislative history sets forth a purpose for the wilderness. The park itself was created to protect significant shoreline lands and waters at Cumberland Island and associated recreational, scenic, scientific, and historical values. By extension, the purpose of the wilderness is to protect the recreational, scenic, scientific, and historical values present within the wilderness boundary. The park currently comprises 36,415 acres, of which approximately 9,907 acres are designated wilderness and 10,710 acres are potential wilderness.

The park's Foundation Document notes that visitor use of the wilderness consists primarily of day-hiking and backpacking. Heaviest visitation to the wilderness occurs during the spring and fall. Visitation is light and substantial opportunities exist for solitude. The heavily forested terrain can be difficult to traverse at all times of year, and the lack of prominent landmarks makes off-trail navigation a challenge. Camping in the wilderness requires a permit and a reservation.

DETERMINATION OF EXTENT TO WHICH COMMERCIAL SERVICES ARE NECESSARY IN WILDERNESS

Part 1: Activities that are proper for realizing the recreational or other purposes of wilderness

For a commercial service to be considered as a necessary form of support for an activity, that activity must be proper for realizing wilderness purposes. Any activity that occurs in designated wilderness must first be of a type that does not violate the prohibitions of §4(c) on the use of motor vehicles, motorized equipment or motorboats, the landing of aircraft, or other forms of mechanical transport. NPS Management Policies 6.4.3 states that recreational uses in wilderness will be of a nature that:

- Enables the areas to retain their primeval character and influence;
- Protects and preserves natural conditions;
- Leaves the imprint of man's work substantially unnoticeable;
- Provides outstanding opportunities forsolitude or primitive and unconfined types of recreation; and
- Preserves wilderness in an unimpaired condition.

In other words, an activity must be subject to sufficient management control so as to preserve wilderness character, which is a fundamental purpose of managing visitor use in a wilderness area. These management controls are outlined and discussed in the activity descriptions below.

The following activities were identified as proper in wilderness and are under consideration to be offered as commercial services in wilderness:

Non-Motorized Boat Tours on Island: The park does not currently offer this service but may consider offering this activity as a commercial visitor service in the future. Commercial non-motorized boat tours, such as but not limited to canoes or kayaks, would depart from and return to an island-based facility. Tours would be hourly and/or half-day ventures with a guide through the sound, rivers, and tidal creeks that are otherwise not accessible. The skilled guide would provide interpretation of the island's resources, ensure safety and resource protection, and instruct the clients. Impacts to wilderness character from commercial trips would be minimal, as trip participants typically would stay in their boats for much of the trip. Impacts would principally result from visitor-generated noise, which can adversely affect noise-sensitive wildlife and diminish the sense of solitude for other visitors to the wilderness. This service would contribute to visitor understanding and appreciation of wilderness on the island, enhance visitors' overall experience, and assist the NPS in educating visitors. It would provide a wilderness experience to visitors who might not otherwise feel comfortable or capable of recreating in wilderness. Commercial outfitting is deemed to be appropriate for the Cumberland Island Wilderness because it helps fulfill the public purposes of recreational use, enjoyment of scenery, and access to primitive areas of the park. *Non-Motorized Boat Rental on Island:* This service would depart and return to an island-based facility. Visitors would be able to recreate in and experience the park's tidal sound, rivers, and tidal creeks that are otherwise not accessible. The boats would also provide a conveyance to some of the island's more distant points. Rentals would generally be hourly or daily with the potential for overnight use to further explore the island. While non-motorized boat rental is available on the mainland, the distance and tidal currents make kayaking/canoeing to the island a significant challenge for the typical visitor. Commercial non-motorized boat rental is deemed to be appropriate for the Cumberland Island Wilderness because it helps fulfill the public purposes of recreational use and enjoyment of scenery.

Guided overnight camping/backpacking: Camping is a traditional wilderness activity that is integral to multi-day trips involving hiking, hunting, or waterways travel (i.e., kayaking and canoeing). Backpacking, which is defined as multi-day hiking while carrying overnight camping gear, has long been popular in the Cumberland Island Wilderness. The ability, and sometimes the necessity, to spend multiple days traveling and camping without encountering permanent human habitation allows visitors to immerse themselves in the wilderness resource and is a defining feature of the island's physical isolation and undeveloped character. Commercial guided overnight camping/backpacking would include services that help visitors find appropriate locations for these activities and provide local knowledge or education about wilderness resources. Provided services could range from an all-inclusive experience (with meals/cooking and gear provided) to a minimalist experience with nothing more than a guide. For now, overnight camping would be exclusively hiking-based on Cumberland Island. The use of stock could be considered in future planning should safety and resource protection concerns be mitigated for feral and domestic stock conflicts. The park currently permits overnight camping in established campsites at Hickory Hill, Yankee Paradise, and Brickhill Bluff. Under the preferred alternative considered in the VUM plan, additional campsites may be added in the wilderness area. Overnight camping is subject to requirements that include: stay length; party size; the requirement to properly store all food; where and if campfires are allowed; type of substrate allowed for camping (bare ground); distance from water bodies (25 feet minimum, 100 feet recommended); and modifying campsites with fire rings, or other structures (all of which are prohibited). Camps at the Brickhill Bluff site may contain items of comfort (e.g., chairs and cooking tables) brought in by motorboats on the adjacent Brickhill River, which is not within designated or potential wilderness. Subject to these requirements and the capacities identified in "Appendix B: Visitor Capacity Analysis", overnight camping is considered an activity that is proper for realizing the recreational and other purposes of wilderness.

Guided Walking/Hiking Tours: These tours would originate and terminate outside of the park and generally access the island via the concessioner's charter or regular ferry service. They could be part

of a larger package tour through the region or support school field trips. Most guided hikes would visit the south end of the island, but some could be targeted for destinations inside wilderness. The park has in place a few conditions on hiking to ensure that these activities remain compatible with wilderness character, i.e., do not lead to unacceptable impacts on resources or social conditions. Hiking is permitted in all areas of the Cumberland Island Wilderness, with the exception of areas that might be closed due to hunting, resource impacts, or safety issues (e.g., wildfires). Hiking is subject to requirements that include: party size; the requirement to properly store all food; and where and if campfires are allowed (although these are rare for day hikers). This management is effective at ensuring that hiking in wilderness is compatible with a wilderness setting and which contrasts with front country environments.

Commercially guided walking/hiking tours are deemed appropriate for the Cumberland Island Wilderness because they help fulfill the public purposes of recreational use and enjoyment of scenery. Subject to these requirements and the capacities identified in "Appendix B: Visitor Capacity Analysis", commercially guided walking/hiking tours are deemed appropriate for the Cumberland Island Wilderness because they help fulfill the public purposes of recreational use and enjoyment of scenery.

Guided Fishing from Land or Water: The park would not initiate this service. However, such services are currently available based out of Camden and Glynn Counties in Georgia and Fernandina Beach, Florida. It is reasonable to expect that these outfits may choose to fish in waters within the park's boundaries. Commercial Use Authorizations would be appropriate for this recreational service.

Commercial guided fishing is appropriate in the Cumberland Island Wilderness because it helps fulfill the recreational and educational purposes of wilderness.

Guided Non-Commercial Photography Trips/Tours (Still Photography and Video): While the park would likely not initiate these programs, it is conceivable that commercial entities may seek such opportunities through a commercial use authorization. These activities would access the island

via the concessioner's ferry or charter service and would likely concentrate on the southern area of the island. However, some tours/classes could be conducted in wilderness. Guided Non-Commercial Photography Trips/Tours are appropriate in the Cumberland Island Wilderness because they help fulfill the educational purpose of wilderness.

*Day-use Education Program*s: Curriculum-based educational experiences would be provided for youth to learn the significance of wilderness and other park resources, the threats to these resources, and the means to protect them. Programs would generally be concentrated in the Dungeness and Sea Camp area and cover both the natural environment and cultural heritage of the island. However, some programs could take place in wilderness. Education programs are appropriate in the Cumberland Island Wilderness because they help fulfill the educational purpose of wilderness.

Residential Education Program (Managed Overnight Experiences): This service would provide curriculum-based overnight education experiences for youth utilizing park campgrounds and other infrastructure to learn the significance of wilderness and other park resources, the threats to these resources, and the means to protect them. Current CUA's encompass day-use programs while the proposed activity would allow an overnight component that would expand opportunities for a more in-depth, comprehensive experience.

Art Tours/Other Types of Classes: While the park would likely not initiate these programs, it is conceivable that commercial entities may seek such opportunities through a commercial use authorization. These activities would access the island via the concessioner's ferry or charter service and would likely concentrate on the southern area of the island. However, some tours/classes could

be conducted in wilderness. Commercial art tours/classes are appropriate in the Cumberland Island Wilderness because they help fulfill the educational purpose of wilderness.

Commercial Filming: The park has been approached a number of times over the years by commercial entities seeking permission to film in the wilderness. Most of these requests have been denied. Instead, permits have been issued to film in areas outside the wilderness. There are occasions, however, when commercial filming in the wilderness is appropriate, as when specific features or areas are sought to be filmed for the public purposes of wilderness (I.e., recreational, scenic, scientific, educational, conservation, and historical use). In those cases, park managers work with the applicant to minimize impacts to other visitors' enjoyment of wilderness and ensure that the applicant occupies the minimum amount of wilderness, for the shortest possible period of time. Commercial filming can be appropriate in the Cumberland Island Wilderness when it helps fulfill the educational or other public purposes of wilderness.

Part 2: Aspects of Wilderness Activities that May Necessitate Commercial Support

The extent to which these forms of commercial service support are necessary depends on a number of factors. Factors that are considered in this analysis include what the park seeks in terms of self-reliant experiences as opposed to novice or introductory experiences, and the range of social and environmental conditions that can be provided while preserving wilderness character. This Determination represents a comparative and qualitative analysis of the relevant wilderness factors and determines whether commercial services are necessary and if so, the amount of commercial services that are necessary.

To be conducted safely and in a manner that preserves wilderness character, wilderness activities often require specialized skills, knowledge, or equipment. Climbing and mountaineering, for example, involve technical skills that are necessary for ascent and descent, safety practices associated with exposure (e.g., fall hazards) and environmental factors (e.g., mountain weather), and special equipment that is employed for locomotion and safety. Stock packing involves special equipment, such as the stock and tack and skill in loading packs, riding saddle horses, leading pack mules, providing care for the animals, and mitigating stock-related environmental impacts. Wilderness visitors vary in their ability to conduct these more specialized or technical wilderness activities. Therefore, when parks choose to provide opportunities for these types of visitor activities, some level of commercial support may be necessary.

Specialized Skills or Knowledge.

For some wilderness visitors the need for, or lack of, specialized skills or knowledge can be a barrier to engaging in that activity. A commercial service may support a visitor activity by providing or teaching the skills or knowledge that are needed to engage in a proper wilderness activity. This may take the form of guiding, in which the outfitter/guide provides the necessary skills or knowledge to the individual or group that is participating in the activity. It may also take an instructional form, in which the outfitter/guide teaches an individual or group the necessary skills or knowledge so that they may independently participate in the activity in the future. In the latter case, the level of instruction may range from basic or introductory wilderness skills and knowledge to advanced technical skills and knowledge. Guides and instructors are also able to provide local knowledge that can make a wilderness trip safer and more rewarding for visitors who are unfamiliar with a particular wilderness area.

Specialized Equipment or Services.

Wilderness activities may require specialized equipment or services that cannot be provided by all wilderness visitors who wish to engage in a particular activity. Regarding specialized equipment, the

expense, care, or space required for that equipment may be too great for some wilderness visitors to provide without support from a commercial service provider. Visitors may wish to try out an activity before making the financial commitment to purchase equipment. Some visitor trips may require services, such as the transporting of equipment or supplies that cannot be provided without commercial support. For each activity that has been determined to be proper for the recreational or other purposes of, we will discuss the specialized equipment or services that may necessitate commercial support.

Special Safety Concerns.

Wilderness activities may involve special safety concerns that cannot be managed by all wilderness visitors without commercial support. The NPS does not attempt to eliminate the risks inherent in wilderness travel or in participation in particular wilderness activities. However, for some visitors, a commercial provider may be a necessary means of managing those inherent risks or may be a means to acquire the requisite knowledge to manage those risks independently in the future. For each activity that has been determined to be proper for the recreational or other purposes of wilderness, we will discuss the special safety concerns that may necessitate commercial support.

Special Resource Concerns.

Wilderness activities may involve the potential for impacts to wilderness resources. A commercial service provider may be a means to ensure that activities are conducted in appropriate locations and in a manner that mitigates or minimizes resource impacts. For each activity that has been determined to be proper for the recreational or other purposes of wilderness, we will discuss the special resource concerns that may necessitate commercial support.

Other Contributions that Support Wilderness Purposes.

Commercial services most often support wilderness visitors in their recreational activities, but they may also independently or cooperatively support scenic, scientific, educational, historic, or conservation objectives.

Introductory Experiences.

Commercial service providers can provide assistance to visitors who lack the experience or confidence to attempt a wilderness adventure on their own. These types of trips can introduce a diverse public to a variety of ways to experience their public wild lands.

Part 3: Types of Commercial Services that are Necessary

Is commercial service necessary? This section uses the categories provided in Part 2 to analyze the aspects of specific activities from Part 1 that may necessitate commercial support to achieve wilderness purposes. A conclusion regarding the necessity for commercial services is made for each activity. The amount of commercial services that would be allowed is addressed in Part 4.

TABLE E-1. NONMOTORIZED BOAT TOURS ON ISLAND – NONMOTORIZED BOAT RENTALS

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Paddling, boat-handling, way-finding wilderness first aid, map reading, sanitation and waste disposal, leadership, and leave-no-trace practices.
Specialized Equipment or Services	Proper use of canoes/kayaks, backpack, water purification equipment, compass/GPS/maps.
Special Safety Concerns	Portages, obstructed waterways, wetland environments, hot and humid weather for much of the year.
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and can assist the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Paddling and exploring are activities that are proper for realizing the public purposes of wilderness. The skills, equipment and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for paddling and hiking. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, paddling allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-2. OVERNIGHT CAMPING / BACKPACKING

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Way-finding, orienteering, the use of overnight equipment, campsite selection, food preparation and appropriate food storage in wilderness, wilderness first aid, map reading, sanitation and waste disposal, leadership, and Leave No Trace practices.

Relevant Wilderness Factors	Rationale
Specialized Equipment or Services	Proper use of backpack, cooking equipment, tent, food storage devices, water purification equipment, compass/GPS/maps.
Special Safety Concerns	Wetland environments, challenging cross-country areas, creek crossings, hot and humid weather for much of the year.
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and can assist the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Backpacking and camping are activities that are proper for realizing the public purposes of wilderness. The skills, equipment and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for backpacking and camping. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, backpacking and camping allow visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-3. GUIDED WALKING / HIKING TOURS IN WILDERNESS

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Way-finding, orienteering, wilderness first aid, map reading, sanitation and waste disposal, leadership, and leave-no-trace practices.
Specialized Equipment or Services	Proper use of compass/GPS/maps.
Special Safety Concerns	Wetland environments, challenging cross-country areas, creek crossings, hot and humid weather for much of the year.
Special Resource Concerns	N/A

Relevant Wilderness Factors	Rationale
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and assists the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Hiking and wayfinding are activities that are proper for realizing the public purposes of wilderness. The skills, equipment and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for hiking and wayfinding to otherwise remote and inaccessible destinations. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, hiking and wayfinding allow visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-4. GUIDED FISHING FROM LAND OR WATER

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Paddling, boat-handling, the use of fishing equipment, wilderness first aid, sanitation and waste disposal, and leave-no-trace practices.
Specialized Equipment or Services	Proper use of canoes/kayaks, fishing equipment, water purification equipment.
Special Safety Concerns	Wetland environment, creek crossings, hot and humid weather for much of the year.
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and can assist the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Fishing is an activity that is proper for realizing the public purposes of wilderness. The skills, equipment and safety issues identified above are

Relevant Wilderness Factors	Rationale
	barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for fishing, especially on waterways. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, fishing allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-5. GUIDED NON-COMMERCIAL PHOTOGRAPHY TRIPS/TOURS (STILL PHOTOGRAPHY AND VIDEO)

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Way-finding, orienteering, wilderness first aid, map reading, sanitation and waste disposal, and leave-no-trace practices.
Specialized Equipment or Services	N/A
Special Safety Concerns	Wetland environment, challenging cross-country areas, orienteering/way-finding, first aid, creek crossings, hot and humid weather for much of the year.
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and can assist the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.

Relevant Wilderness Factors	Rationale
Conclusion	Non-commercial photography is an activity that is proper for realizing the public purposes of wilderness. The skills and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for photographing the wilderness. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, non-commercial photography allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-6. COMMERCIAL RESIDENTIAL EDUCATION PROGRAMS (DAY AND OVERNIGHT)

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Paddling, boat-handling, way-finding, orienteering, the use of overnight equipment, campsite selection, food preparation and appropriate food storage in wilderness, wilderness first aid, map reading, sanitation and waste disposal, leadership, and leave-no-trace practices.
Specialized Equipment or Services	Proper use of canoes/kayaks, backpack, cooking equipment, tent, food storage devices, water purification equipment, compass/GPS/maps.
Special Safety Concerns	Wetland environments, challenging cross-country areas, orienteering/way-finding, first aid, creek crossings, hot and humid weather for much of the year.
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and can assist the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Wilderness-related education classes are activities that are proper for realizing the public purposes of wilderness. The skills, equipment and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for education classes taking place in wilderness. The availability of commercial support may also offer opportunities for introductory wilderness experiences. In terms of desired conditions, wilderness-related education classes allow visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreational experience. The use of commercial support services also helps to achieve the desired condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

TABLE E-7. COMMERCIAL FILMING

Relevant Wilderness Factors	Rationale
Specialized Skills and Knowledge	Participation in commercial filming in wilderness would require self-sufficiency in wilderness land with the associated knowledge to safely navigate throughout the area and conduct filming.
Specialized Equipment or Services	N/A
Special Safety Concerns	N/A
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	In most instances, commercial filming will be directed to areas outside of wilderness. However, in certain circumstances the park could decide that commercial filming in the service of the public purposes of wilderness would lead viewers to a better understanding of wilderness character, purposes, and values, and assist the public in appropriately experiencing their public lands.
Introductory Experience	N/A
Conclusion	Commercial filming is an activity that, in the right circumstances, can be proper for realizing the public purposes of wilderness. To be appropriate, the filming must need to take place within the wilderness boundary to elucidate the wilderness character of some specific place, feature, or other aspect of the Cumberland Island Wilderness.

Part 4: Extent of Commercial Services Determined Necessary for Each Proper Wilderness Activity

This section considers each activity in terms of the wilderness management goals, desired conditions and visitor capacities. A determination is reached about the amount of commercial services that would be authorized for each activity. Other mechanisms available for the management of commercially-supported activities are discussed where relevant.

As set forth above, the following activities have been identified as necessary and appropriate in the Cumberland Island National Seashore Wilderness:

- Non-Motorized Boat Tours on Island - Canoe/Kayak/Rentals
- Wilderness Camping/Backpacking
- Guided Walking/Hiking Tours in Wilderness
- Guided Fishing on Land and Water
- Guided Non-Commercial Photography Trips/Tours (Still Photography and Video)

- Commercial Residential Education Programs (Day and Overnight), to include, e.g., Environmental Education; Astronomy; Bird Watching; Outdoor Skills; Rescue/Survival Training; Wilderness Education/Therapy; Art Classes
- Commercial Filming

At present, the level of commercial services offered in the Cumberland Island Wilderness is low. The National Park Service has determined that additional commercial operators could operate in the wilderness to beneficial effect, without adversely affecting wilderness character.

In some instances, the National Park Service and commercial operators may offer similar services. Where this occurs, the programs of the commercial operators currently complement and do not detract from similar programs offered by the National Park Service. No change in this situation is expected in the coming years.

As mentioned in "Appendix B: Visitor Capacity Analysis," the extent to which commercial services will be allocated in wilderness was identified to be no more than 15% of annual overnight use. This ensures that commercial services may operate within wilderness, but that their operations do not dominate a recreational opportunity for the public. Regarding the other activities, the NPS does not intend to actively manage the number of commercial use authorizations permitted in wilderness for the foreseeable future. Special use permits, particularly those for commercial filming, will be reviewed and issued on a case-by-case basis.

Should conditions change, the National Park Service will revisit this analysis. Likewise, the National Park Service will prepare an updated extent necessary determination when it develops a wilderness stewardship plan for the park.

This page intentionally left blank.

APPENDIX G: BIOLOGICAL EVALUATION

VISITOR USE MANAGEMENT PLAN / ENVIRONMENTAL EVALUATION
BIOLOGICAL EVALUATION

CUMBERLAND ISLAND NATIONAL SEASHORE

OCTOBER 2022

NATIONAL PARK SERVICE – U.S. DEPARTMENT OF INTERIOR

INTRODUCTION

The Endangered Species Act of 1973 (16 U.S.C. 153 *et seq*.), as amended (ESA or Act) in section 7(a)(1) directs federal agencies to conserve and recover listed species and use their authorities in the furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species so that listing is no longer necessary (50 CFR §402). Furthermore, the Act in section 7(a)(2) directs federal agencies to consult (referred to as section 7 consultation) with the U.S. Fish and Wildlife Service (USFWS) when their activities "may affect" a listed species or designated critical habitat. Additionally, NPS Management Policy (2006) directs the NPS to "inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible".

PURPOSE OF THIS BIOLOGICAL EVALUATION

This biological evaluation (BE) analyzes the potential effects of the visitor use management plan on the Cumberland Island National Seashore (park) on federally listed threatened, endangered, proposed animal (wildlife, invertebrates, and fish) species, pursuant to section 7(a)(2) of the ESA. Federally listed threatened and endangered animal species meeting the following criteria are addressed in this Evaluation:

- known to occur in the park based on confirmed sightings;
- may occur in the park based on unconfirmed sightings;
- potential habitat exists for the species in the park; or
- potential effects may occur to these species.

CURRENT MANAGEMENT DIRECTION

Current management direction for federally listed and proposed threatened and endangered species can be found in the following documents, filed at our office:

- Endangered Species Act of 1973, as amended (ESA or Act)
- 1916 NPS Organic Act
- NPS General Authorities Act of 1978
- NPS Management Policies 2006
- Migratory Bird Treaty Act (MBTA)
- National Environmental Policy Act (NEPA)
- Marine Mammal Protection Act of 1972

CONSULTATION HISTORY

The NPS initiated Informal consultation in September 2019 with the USFWS Coastal Georgia Ecological Services Field Office to discuss the plan/EA and potential impact to federally listed species and their critical habitats. The most recent list of federally listed species was obtained from the USFWS IPaC website on August 1, 2019, and again on September 7, 2022. Using this list, the park determined which of those species and their critical habitats had a potential to occur within the plan study area. Park staff met with representatives from USFWS onsite on October 2, 2019 to discuss the proposed management plan and to seek input on those species with the potential to occur in the project area. The NPS reached out to the National Oceanic and Atmospheric Administration

(NOAA) National Marine Fisheries Service (NMFS) on September 20, 2019 to discuss the proposed actions and the appropriate compliance pathway. Federally listed species with the potential to occur within the study area and critical habitat are further analyzed in this biological evaluation prepared for the plan. Species not known or with no potential of occurring in the study area were excluded from further review in the biological evaluation with a "no effect" determination, corresponding rationale, and were not further analyzed. Subsequent telephone conversations and meetings occurred between October 2019 and February 2020.

PROPOSED MANAGEMENT ACTION (NPS PREFERRED ALTERNATIVE)

The preferred alternative aims to balance visitor use opportunities and resource protection in the areas of Cumberland Island under NPS jurisdiction. Actions proposed under this alternative include enhanced visitor recreational opportunities related to camping in designated wilderness as well as the park's backcountry and frontcountry areas; hiking along an extended trail network; visiting the Plum Orchard district; and utilizing on-island commercial services. This alternative incorporates visitor use management strategies including implementing visitor capacities at key locations. Mitigation measures and best management practices that would be implemented under the action alternative are included in appendix A.

Indicators and Thresholds

The National Park Service would conduct monitoring as part of the implementation of the chosen alternative to ensure that desired conditions for resources and visitor experiences are achieved and maintained. Monitoring is the process of routinely and systematically gathering information or making observations to assess the status of specific resource conditions and visitor experiences, and is a critical step in successfully implementing this VUM plan. This plan establishes a monitoring strategy that is designed to generate usable data for periodically comparing existing and desired conditions, assessing the need for management actions, and evaluating the efficacy of management actions. This iterative practice of monitoring, implementing potential management strategies, and then continuing to monitor to gauge the effectiveness of those actions allows park managers to maximize benefits for visitors while achieving and maintaining desired conditions for resources and visitor experiences in a dynamic setting.

The monitoring strategy for this plan was developed using the guidance developed by the Interagency Visitor Use Management Council (IVUMC, or the council), and is considered part of the action alternative. The monitoring strategy includes indicators, thresholds, and objectives. Indicators translate desired conditions of the VUM plan into measurable attributes (e.g., linear extent of visitor-created trails) that when tracked over time, evaluate change in resource or experiential conditions. Thresholds represent the minimum acceptable condition for each indicator and were established by considering qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, professional judgement of staff from management experience, and scoping on public preferences. Objectives were established in situations in which managers want to define measurable outcomes for what should be achieved within specified timeframes.

The following indicators were identified to be most important in maintaining desired conditions for visitor experience and natural and cultural resources. Thresholds, objectives, rationales, monitoring guidelines, and associated management strategies will be included in the environmental assessment.

1. Indicator: Number of people entering posted closures (temporary or permanent) of sensitive shorebird areas.
2. Indicator: Number of people per viewshed at Nightingale Beach.

3. Indicator: Number of people encountered on trails per day in designated wilderness.

The management strategies related to the indicators would be implemented incrementally as thresholds are approached or exceeded, or to achieve an objective.

Visitor Capacity

The primary goal of this VUM plan is to preserve the fundamental resources and values of Cumberland Island. The amount, timing, distribution, and types of visitor use on Cumberland Island influences both conditions of fundamental resources and visitor experience.

The visitor capacities for this plan are considered part of the proposed action alternative. Visitor capacity is defined as the maximum amounts and types of visitor use that an area can accommodate, while achieving and maintaining the desired resource conditions and visitor experience that are consistent with the purposes for which the area was established (IVUMC, 2016). By identifying visitor capacities and managing the amounts and types of use within those capacities, the National Park Service can better protect resources and provide visitors with opportunities for high-quality experiences. Identification of visitor capacities, and strategies to manage these capacities, is also directed by the National Parks and Recreation Act of 1978. To identify the appropriate amounts and types of use at key areas, a variety of data was reviewed to understand current conditions compared to desired conditions for the area. The visitor capacity identification also takes into consideration management objectives and strategies being implemented for an area. If the visitor capacity analysis identified any additional actions needed to manage within visitor capacities, these actions were added to the proposed action alternative.

TABLE G-1. VISITOR CAPACITY AT KEY LOCATIONS – PEOPLE AT ONE TIME (PAOT)

Analysis Area (Key Location)	Visitor Capacity
Nightingale Beach	69 people at one time (PAOT)/mile of beach
Stafford-Greyfield Beach	24 PAOT/mile of beach
Jetty Beach	24 PAOT/mile of beach
North Beach	12 PAOT/mile of beach
South End Beach	60 PAOT in the open portion of South End Beach. (The visitor capacity for the closed area to the west of the beach access area is 0 PAOT)
Dungeness Ruins	92 PAOT
Plum Orchard	115 PAOT: 70 PAOT in the mansion 45 PAOT on the grounds

Analysis Area (Key Location)	Visitor Capacity
Settlement	33 PAOT, 100 people per day: 9 PAOT inside the First African Baptist Church 12 PAOT in the immediate vicinity 12 PAOT in other areas
Wilderness	210 PAOT: 72 PAOT in campsites 138 PAOT on trails

TABLE G-2. VISITOR CAPACITY SUMMARY FOR OTHER LOCATIONS

Analysis Area	Visitor Capacity
Sea Camp Campground	148 people per night: 90 visitors in individual sites per night 40 visitors in group sites per night 18 users in administrative sites/night
Dungeness Dock	200 PAOT
Sea Camp Dock	200 PAOT
Stafford Campground	36 people per night
Stafford/Little Greyfield Area	12 people at one time
Hunt Camp	18 people per night
Beach Creek Campsites	18 people per night
Beach Creek	20 motorized boats per day, and 20 nonmotorized boats per day
Southern Uplands	12 people at one time
Mainland Museum	35 people at one time
Mainland Visitor Center	50 people at one time

Ferry Delivery

Management of daily ferry delivery to the island is crucial to maintaining and protecting the desired experience and resource conditions of the park. It is also an important aspect to managing the amounts and types of use within the identified visitor capacities for key areas and ensuring thresholds are not exceeded. Management of daily ferry delivery to the island is considered part of the proposed action alternative. The framework park managers would use to identify how many

passengers the ferry service can deliver to Cumberland Island per day is discussed in appendix C of the environmental assessment.

Based on the analysis in appendix C of the environmental assessment, the park may increase daily ferry delivery to the island from current levels without adversely impacting desired conditions, exceeding thresholds, or exceeding visitor capacities. The analysis in appendix C estimates that the ferry could deliver approximately 600 people per day to the Dungeness and Sea Camp docks combined. In addition to the 600 people delivered to the Sea Camp and Dungeness area, the analysis estimates that another 100 people per day could be delivered directly to Plum Orchard if ferry service to that location is established under the preferred alternative. The number of people delivered to the island by ferry each day wouldl be managed incrementally and adaptively. As the plan is implemented and additional visitors are delivered to the island each day, two key indicators (PPV at Nightingale Beach and encounter rates in wilderness) would be monitored. If conditions approach their respective thresholds for these indicators, park managers may make adjustments to ferry delivery in terms of the daily delivery number, timing of delivery, and spatial distribution of delivery by working with the concessioner.

TABLE G-3. PROPOSED ACTIONS OF THE PREFERRED ALTERNATIVE

Management Topic	Description of Action Alternative
Designated Wilderness Camping	The park would offer camping opportunities at four designated wilderness campsites and maintain the number of visitors that could camp in the designated wilderness at one time. Brickhill Bluff and Hickory Hill would remain active. Additional wilderness campsites would be designated at Toonahowie and Sweetwater Lakes. Sites at Hickory Hill and Sweetwater Lakes campsites would be accessed by foot while the Brickhill Bluff and Toonahowie sites could be accessed via land or nonmotorized and/or small motorized watercraft. The existing site at Yankee Paradise would be abandoned and generally replaced by public camping opportunities at Hunt Camp campground, which is adjacent to but outside of the wilderness area. Similar to the no-action alternative, wilderness campsites would consist of small, cleared spaces and wells, but no other infrastructure or development. The existing well at Toonahowie would be modified for camper use; at the Sweetwater Lakes campsite, campers could access water from the lake. The campsites in designated wilderness would continue to be administered through a permit system managed by Recreation.gov. Fees would be implemented for public campsite reservations. Permits for each of the 4 wilderness sites would be available for up to 3 parties of 6 people or less at one time. A maximum of 72 visitors would be able to camp in the designated wilderness at one time (4 sites x 3 parties x 6 people = 72 campers).
Backcountry Camping	The park would offer backcountry camping opportunities at current levels at Stafford Beach Campground and new opportunities at Beach Creek campsite and Hunt Camp campground. The designated backcountry sites would continue to be administered through a permit system managed by Recreation.gov; fees would be implemented for public campsite reservations. Stafford Beach Campground would continue to accept reservations for 6 of the 10 existing sites at any one time to allow individual sites to recover from visitor use. Up to 36 people would be allowed to camp at Stafford Beach Campground at one time (6 available sites x 6 people = 36 campers). Similar to wilderness campsites, the backcountry campsite at Beach Creek would consist of small cleared spaces and a well, but no other infrastructure or development. The sites would be accessible by nonmotorized and/or small motorized watercraft or by trail (see South End Trail description below for additional details). Three parties of up to 6 people each would be permitted to camp at Beach Creek at one time.

Management Topic	Description of Action Alternative
	When Hunt Camp campground, which is adjacent but not in the Cumberland Island Wilderness Area, is not being used for the public hunts it would be available to the public through individual site reservations. No new infrastructure would be needed at Hunt Camp. Reservations would be available for 3 parties of up to 6 people on any given night for a total of 18 campers. Under the preferred alternative, a maximum of 72 campers could camp in the backcountry on any given night (36 Stafford Beach campers + 18 Beach Creek campers + 18 Hunt Camp campers).
Sea Camp Campground (frontcountry camping) and Sea Camp Dock	The park would expand camping opportunities at Sea Camp Campground by adding the 3 existing overflow sites to the current reservation system. Fifteen of the 19 individual sites would be available for visitors to reserve at any one time and 4 sites would be rotated into administrative closures to allow recovery or prevent impacts from heavy use. Parties of up to 6 campers would be able to reserve sites through Recreation.gov and fees would continue to be implemented for public campsite reservations. The two group sites that can accommodate up to 20 campers would remain open for reservations as well. Under the action alternative, up to 130 people may camp in the frontcountry campground at one time, with 40 campers allowed in the group sites and 90 campers allowed in the individual sites ([15 available sites x 6 people] + [2 group sites x 20 visitors] = 130 campers). Kayak and/or canoe rentals could be available at Sea Camp Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be used. Considerations would be taken to protect sensitive natural and/or cultural resources.
South End Beach and Waters	The park would designate an approximately 1,900-foot-wide visitor access and boat landing and anchoring area along South End Beach that could shift from year to year depending on coastline conditions. Establishment of this area would designate an area accessible to visitors and guide visitor use away from sensitive natural resources. Landing and anchoring zones and accessible/non-accessible areas would be delineated by buoys, markers, signage, and/or flagging. Signage that provides information regarding sensitive species, directs visitors to pay park entrance fees, and notifies commercial service providers of the requirement to have a commercial use authorization would be installed. Overnight anchoring at South End Beach would not be allowed. Dogs would **NOT** be permitted on South End Beach. Pedestrian access to South End Beach would continue via Dungeness Beach Crossing. Beach Creek would be designated as a no-wake zone as would the small, unnamed tidal creeks that occupy the marsh area just north of South End Beach.
South End Trail	The park would construct and realign South End Trail to provide a loop trail opportunity by connecting the Dungeness Marsh Boardwalk to portions of the existing trail. That new segment would serve as one leg of the loop and the beach would serve as the other leg. A new spur trail would be constructed to connect the existing South End Trail with the proposed Beach Creek backcountry campsite. A portion of the existing South End Trail that runs through the south end marsh would be abandoned and the segment realigned onto upland terrain.
Plum Orchard	The park would continue to offer daily NPS-guided tours of the Plum Orchard Mansion. Visitors would continue to be able to access Plum Orchard grounds via bicycling along park roads, hiking, personal boat, or as part of the Lands and Legacies commercial tour. Additional ferry service to Plum Orchard dock would be considered as a new, separate ferry route or as an additional stop on the existing route/schedule. Visitors debarking from the Plum Orchard ferry stop would have direct access to the Plum Orchard grounds and could opt to take one of the NPS-guided tours of the mansion or decide to use the ferry stop as an arrival /departure point for wilderness and backcountry hiking or camping experiences.

Management Topic	Description of Action Alternative
	A new shorter motorized concessions tour from Sea Camp to Plum Orchard would allow day-use visitors more flexibility to also visit other key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. Kayak and/or canoe rentals could be available at Plum Orchard Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be used. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.
Nightingale Beach and Trail	The park would create one new trail segment to provide direct beach access from Nightingale Trail. A bathhouse consisting of restrooms and outdoor showers (~400 square feet) would be constructed at the junction of the existing Nightingale Trail and the new segment. Approximately 2,670 feet of water utility line would be installed from an existing well house, across the Main Road, and along the Nightingale Trail. Electricity would either be provided by solar panels or by extending an existing utility line approximately 1,850 feet along the Nightingale Trail from the main road. These utility lines would be installed using a trenching machine along existing roads and trails. An approximately 1,200 square foot septic leach field would be installed in appropriate proximity to the bathhouse. The exact location of these facilities would be determined during design. Additional compliance requirements would occur before implementation. A pavilion (~800 square feet) would also be constructed alongside the Nightingale Beach access spur, providing shelter to visitors in the dune field. Additional compliance requirements would occur before implementation.
Dungeness	A pavilion (~800 square feet) would be constructed near the Dungeness Beach boardwalk, providing shelter to visitors in the dune field. Kayak and/or canoe rentals could be available at Dungeness Dock or Beach Creek Dock if either location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the docks would be used. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.
Bicycle Use and Management	Use of bicycles and Class 1, 2, and 3 electric bicycles (e-bikes) on the beach would be extended north between Sea Camp and Stafford Beach Crossings. Bicycles and e-bikes would still be permitted on all public roads, including the road between Sea Camp Dock and Sea Camp Campground, and parking areas per 36 CFR 4.30. Bike use would be prohibited on park trails and boardwalks, including the boardwalk from Sea Camp Campground to the beach. Bicycle use would continue to be allowed on the beach from August 1 through March 1; however, from April 1 through July 31, bicycle and e-bike use would remain prohibited from 30 minutes before sunset to 30 minutes after sunrise during turtle nesting season (April 1 and October 30). For bicycle and e-bike speed limits, please see the superintendent's compendium. Additionally, the park would actively manage the maximum number of personal bikes transported on the ferry and rented through the on-island concession. No more than 15 bicycles would be delivered per vessel and no more than 25 bicycles would be available for rent through the on-island concession. The total daily combined number of bicycles delivered and available for rent would not exceed 100.
Visitor Services Provided by Concessioner or Commercial Use Authorization	The park would expand the types of visitor services offered through commercial agreements. On-island bike and cart rentals would continue. An on-island kayak and/or canoe rental service, with the possibility of guided rental options, would be considered at Plum Orchard, Sea Camp, or Dungeness. Existing or temporary infrastructure would be used and considerations would be taken to protect sensitive natural and/or cultural resources.

Management Topic	Description of Action Alternative
	Passenger ferry service from St. Marys, Georgia, could be expanded to include mid-afternoon ferry trips, earlier departures from the mainland, and/or a sunset return option. An additional Plum Orchard ferry stop would also be considered. The park would expand motorized concession tours to offer a Sea Camp to Plum Orchard tour that would allow day-users more flexibility to visit key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. Visitors could have the opportunity to purchase health, safety, and essential camping items, as well as bookstore-appropriate merchandise (souvenirs, books, etc.), on the island.
Education / Interpretation and Signage	Increased visitor education would be provided (e.g., interpretation, signage, literature) regarding sensitive species, allowable visitor uses and locations, and how visitors can help protect island resources. Installation of signs would occur outside the wilderness area wherever possible. Additional signage regarding the no-wake zones and no dogs on South End Beach would be posted in appropriate locations. Outreach to local underserved populations would be expanded and opportunities to provide more affordable access to the island for these groups would be explored. This could include expanded outreach to local school and youth groups and/or a partnership with the ferry concession operator or local philanthropic groups to provide assistance to individuals and families unable to afford the normal ferry fare.

ACTION AREA DESCRIPTION

Cumberland Island National Seashore is the largest and southernmost of Georgia's barrier islands. Located between 1 mile and 3 miles off the mainland coast, the island is bounded by the Cumberland River on the west, St. Andrew's Sound on the north, the Atlantic Ocean on the east, and Cumberland Sound on the south. The island is 17.5 miles long, ranges from approximately 0.5 miles to 3 miles wide, and totals 36,415 acres (of this, 16,850 are marsh, mud flats, and tidal creeks). The northern portion includes 9,907 acres of designated wilderness, while an additional 10,710 acres are classified as potential wilderness. Most of the island's uplands are federally owned and managed by the National Park Service (NPS). The remaining portions of the island are state owned, privately owned, or owned by other federal entities, including the Department of Defense (figure 1).

A small number of people have private homes on the western and northern regions of the island, though very few live on the island throughout the year. Roughly 922 acres of Cumberland Island are privately held without restrictions.

PRE-FIELD REVIEW

Documentation of federally listed species and designated critical habitat in the action area was obtained from the USFWS IPaC website on August 1, 2019 and again on September 7, 2022. Using this list, the NPS determined which of these species and critical habitat had a potential to occur within the action area (shown in table 3 below). Species not known or with no potential of occurring in the action area are documented with rationale in table 3 below and will not be discussed further in this document. Excluded species have been dropped from further analysis by meeting one or more of the following conditions:

1. Species does not occur, nor is expected in the action area during the time activities would occur
2. Occurs in habitats that are not present

3. Is outside of the geographical or elevational range of the species.

In addition, Table 3 provides a brief summary of federally listed/proposed species; designated/proposed critical habitat; species' habitat requirements; and occurrence information of species that are known or may occur in the action area.

As indicated, the action area includes designated critical habitat for the loggerhead sea turtle (*Caretta caretta*) and piping plover (*Charadrius melodus*). Direct, indirect, or cumulative effects could occur within designated critical habitat and is addressed further in this evaluation.

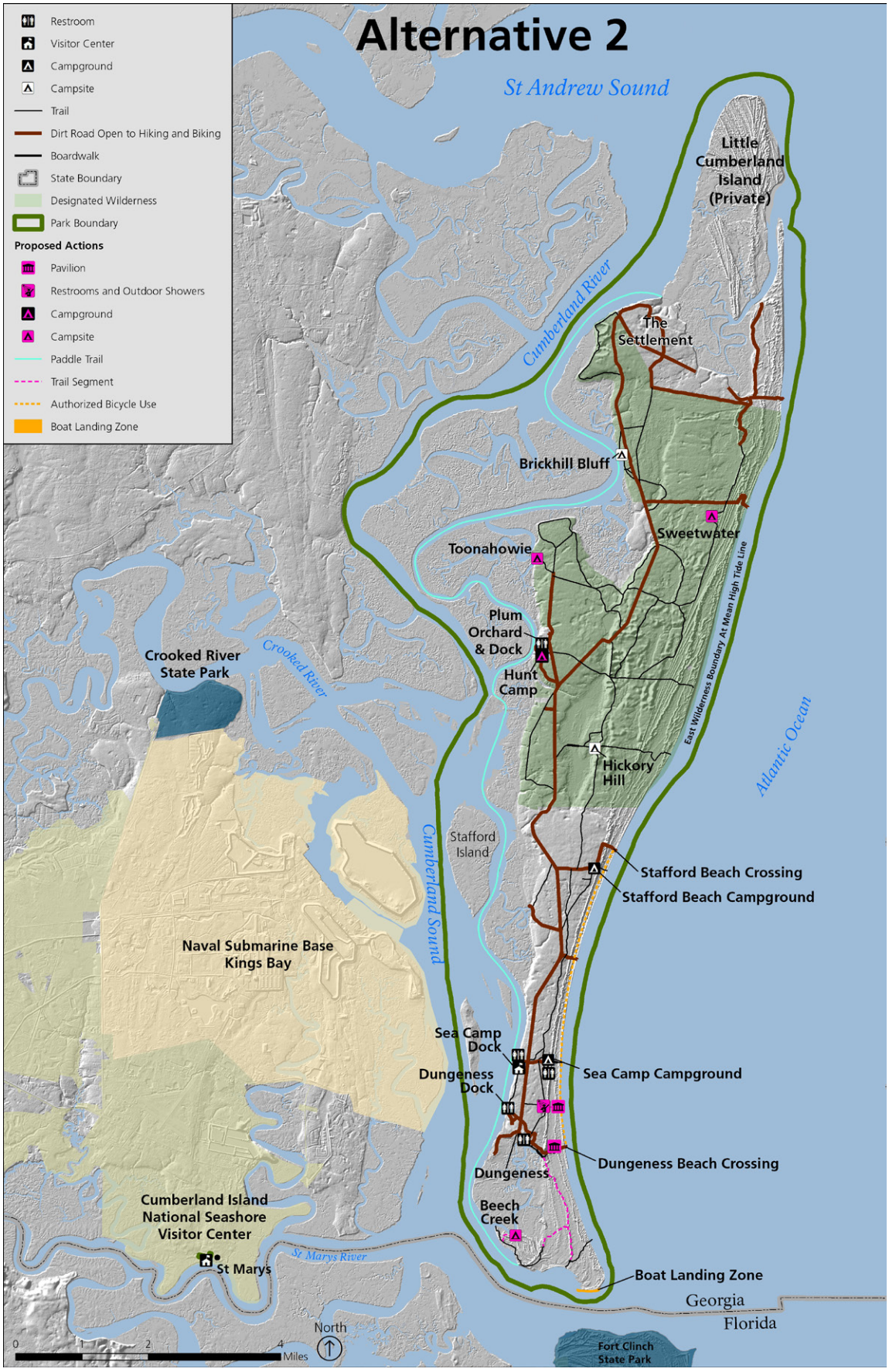


Figure G-1. Cumberland Island National Seashore Preferred Alternative

SPECIES CONSIDERED AND EVALUATED

The following table indicates whether the species from the USFWS official species list (9/7/2022) are known or expected to occur in the action area; if suitable habitat is present; or why they are excluded from further analysis.

TABLE G-4A. THREATENED, ENDANGERED, CANDIDATE/PROPOSED SPECIES WITH THE POTENTIAL TO OCCUR AT CUMBERLAND ISLAND AND CRITICAL HABITAT- MAMMALS

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
West Indian manatee *Trichechus manatus*	T	Yes	No	N/A	In coastal Georgia, manatees occur in tidal freshwater, brackish, and marine environments. Their typical coastal and inland habitats include coastal tidal rivers and creeks such as the Cumberland River and Cumberland Sound area, salt marshes, and freshwater springs (Smith 1993). Manatees are observed regularly in the St. Marys River, tidal creeks, and the ocean. Critical habitat for the species does exist to the south of the island in Florida.

The USFWS species list (USFWS 2019a, USFWS 2022a) was obtained from IPaC website on 9/7/2022. Species and critical habitat not having the potential to occur were excluded from further review with a no effect determination and associated rationale, below.
N/A=Not applicable
1 Status Codes: E=federally listed endangered; T=federally listed threatened; C=candidate for listing and CH=designated critical habitat2 Exclusion Rationale Codes: HAB= no habitat present in action area

TABLE G-4B. THREATENED, ENDANGERED, CANDIDATE/PROPOSED SPECIES WITH THE POTENTIAL TO OCCUR AT CUMBERLAND ISLAND AND CRITICAL HABITAT- BIRDS

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Eastern black rail *Laterallus jamaicensis* ssp. *jamaicensis*	T	Yes	No	N/A	Along the southern Atlantic coast, Eastern black rail habitat includes salt and brackish marshes. They require dense vegetation that allows for their movement beneath. This dense plant structure has been found to be more important than plant species composition in predicting habitat suitability. The tidally and nontidally influenced salt, brackish, and freshwater marsh habitats around the western portion of the island provide habitat for the Eastern black rail.
Piping plover *Charadrius melodus*	T, CH	Yes	Yes	N/A	Usually on ocean beaches or on sand or algal flats in protected bays (Haig 1992). Most abundant on expansive sandflats, sandy mudflats, and sandy beach in

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Atlantic Coast and Northern Great Plains population					close proximity; usually in areas with high habitat heterogeneity. There is no nesting habitat on the island, but they are known to be present for up to 10 months of the year between June through April.
Piping plover *Charadrius melodus* Great Lakes watershed DPS	T (outside of breeding grounds), CH	Yes	Yes	N/A	Usually on ocean beaches or on sand or algal flats in protected bays (Haig 1992). Most abundant on expansive sandflats, sandy mudflats, and sandy beach in close proximity; usually in areas with high habitat heterogeneity. There is no nesting habitat on the island, but they are known to be present for up to 10 months of the year between June through April.
Red knot *Calidris canutus rufa*	T	Yes	No	N/A	Beaches, river mouth/tidal river, Tidal flat/shore. There is no nesting habitat on the island, but they have been recorded foraging on the island during spring and fall migrations.
Red-cockaded woodpecker *Picoides borealis*	E	No	No	HAB	Habitat of open, mature pine woodlands. Prefer open savanna with scattered overstory of mature pines and dense groundcover. Historically was present on Cumberland Island, but currently not known to occur per conversations with park staff and USFWS staff. Dismissed from further analysis.
Wood stork *Mycteria Americana*	T	Yes	No	N/A	Primarily found in freshwater marshes, swamps, lagoons, and ponds, but also occur in brackish wetlands. Known to occur on the island, but the last known nesting area was in the Sweetwater Lakes/Lake Whitney area in 2002. The freshwater marsh, swamps, lagoons, ponds, and brackish wetland habitat of the island are still used as foraging grounds throughout the year.

The USFWS species list (USFWS 2019a, USFWS 2022a) was obtained from IPaC website on 9/7/2022. Species and critical habitat not having the potential to occur were excluded from further review with a no effect determination and associated rationale, below.
1 Status Codes: E=federally listed endangered; T=federally listed threatened; C=candidate for listing and CH=designated critical habitat2 Exclusion Rationale Codes: HAB= no habitat present in action area

TABLE G-4C. THREATENED, ENDANGERED, CANDIDATE/PROPOSED SPECIES WITH THE POTENTIAL TO OCCUR AT CUMBERLAND ISLAND AND CRITICAL HABITAT—INSECTS

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Monarch butterfly *Danaus plexippus*	C	Yes	No	N/A	In Georgia, the butterfly is found in open habitats and depends on a variety of native milkweed species and plants that produce nectar. They migrate across Georgia in the fall as they head toward the mountains of Mexico. They return to Georgia and other states in the spring as they return north. The butterfly was noted as a candidate for listing in December 2020 but is not yet listed under the Endangered Species Act. While the butterfly is declining across their native range in North America, they have been ranked as "S4, Apparently Secure" in Georgia (NatureServe 2022).

TABLE G-4D. THREATENED, ENDANGERED, CANDIDATE/PROPOSED SPECIES WITH THE POTENTIAL TO OCCUR AT CUMBERLAND ISLAND AND CRITICAL HABITAT—AMPHIBIANS AND REPTILES

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Eastern indigo snake *Drymarchon corais couperi*	T	No	No	HAB	Per the NPS Integrated Resource Management Applications species lists for Cumberland Island National Seashore, park staff, and USFWS input, the species is not known to occur on the island. The snake requires large areas of territory, which are not available on the island. Dismissed from further analysis.
Gopher tortoise *Gopherus Polyphemus*	C	Yes	No	N/A	Inhabits well-drained sandy soils with sufficient herbaceous vegetation for food and sunny areas for nesting. Known to occur on the island.
Carolina gopher frog *Lithobates capito*	C	Yes	No	N/A	Inhabits native xeric uplands, particularly longleaf pine-turkey oak associations. Generally occurs only where gopher tortoise are present. Breeding occurs in ephemeral to semi-permanent freshwater wetlands that do not contain large predatory fish. Not known to occur on the island, but potential habitat is present.

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Green sea turtle *Chelonia mydas*	T	Yes	No	N/A	Marine turtles that come ashore to nest. Nesting generally occurs at night, on beaches, and typically on islands. Most nesting occurs on high-energy beaches with deep sand. Cumberland Island provides nesting habitat for a small population of green sea turtles.
Hawksbill sea turtle *Eretmochelys imbricata*	E	Yes	No	N/A	Known to occur infrequently on the Atlantic coast of central and southern Florida and the Florida Keys (NatureServe 2022). While the turtle has been seen in the vicinity of the island, it is not known to nest on the island. This species is typically found in pantropical and warm-temperate regions.
Kemp's ridley sea turtle *Lepidochelys kempi*	E	Yes	No	N/A	Marine turtles that come ashore to nest. Kemp's ridley sea turtles have been known to nest in small numbers on Cumberland Island. Most recently, two nests were recorded in 2017.
Leatherback sea turtle *Dermochelys coriacea*	E	Yes	No	N/A	Marine turtles that come ashore to nest. Nesting generally occurs at night, on beaches in the Western Hemisphere between March and August. Leatherback turtles have been known to nest in small numbers on Cumberland Island.
Loggerhead sea turtle *Caretta caretta*	T, CH	Yes	Yes	N/A	Found worldwide, primarily in subtropical and temperate ocean waters. Nest primarily along the Atlantic coast of Florida, Georgia, South Carolina, and North Carolina. Cumberland's 18-mile undeveloped beach is one of the most important loggerhead sea turtle nesting areas in Georgia (NPS 2019a).

The USFWS species list (USFWS 2019a, USFWS 2022a) was obtained from IPaC website on 9/7/2022. Species and critical habitat not having the potential to occur were excluded from further review with a no effect determination and associated rationale, below.
1 Status Codes: E=federally listed endangered; T=federally listed threatened; C=candidate for listing and CH=designated critical habitat2 Exclusion Rationale Codes: HAB= no habitat present in action area

TABLE G-4E. THREATENED, ENDANGERED, CANDIDATE/PROPOSED SPECIES WITH THE POTENTIAL TO OCCUR AT CUMBERLAND ISLAND AND CRITICAL HABITAT-—FISH

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus*	E	Low	No	N/A	Migratory species that hatch in freshwater rivers, head out to sea as juveniles, and return to their birthplace as adults to spawn or lay eggs Known to

Species Common and Scientific Name	Status[1]	Potential to Occur	Critical Habitat	Rationale for Exclusion[2]	Habitat Description and Range in Action Area
					occur in the St. Marys River main stem north of Cumberland Island and seasonally within Cumberland Sound, along the western shoreline of the island (Fox et al. 2018).
Shortnose sturgeon *Acipenser brevirostrum*	E	Low	No	N/A	Live in rivers and coastal water from Canada to Florida. Spend relatively little time in the ocean. Recently discovered in both the Satilla and St. Marys Rivers, just west of Cumberland Island.

The USFWS species list (USFWS 2019a, USFWS 2022) was obtained from IPaC website on 9/7/2022. Species and critical habitat not having the potential to occur were excluded from further review with a no effect determination and associated rationale, below.
1 Status Codes: E=federally listed endangered; T=federally listed threatened; C=candidate for listing and CH=designated critical habitat2 Exclusion Rationale Codes: HAB= no habitat present in action area

As indicated in the above table, there are twelve federally listed threatened or endangered species, two candidate species with the potential to occur, and two designated critical habitats within the action area. Therefore, only those species and critical habitat will be addressed hereafter in this evaluation. The remaining species/critical habitat shown above without a potential to occur in the action area will not be analyzed further based on the rationale provided. The proposed action will have no effect on these other species or critical habitat.

EVALUATED SPECIES INFORMATION

West Indian Manatee

Field Reconnaissance

West Indian manatees are known to occur in high numbers in the intercostal waters of Cumberland Island and northern Florida, immediately south of the island. They migrate from Florida to Georgia each spring to feed on abundant marsh grass and aquatic vegetation. Some individuals go back and forth between the states throughout the summer, returning to Florida for the winter when water temperatures fall. According to the Georgia Department of Natural Resources, from April to October, manatees occur in all tidal waters throughout coastal Georgia (GA DNR 2018). At Cumberland Island, they are frequently seen around the boat docks on the western shoreline of the island.

Motorized and non-motorized boats frequently travel in Cumberland Sound and private boats are permitted to dock during the day at all three docks on the western shore of the national seashore. As a result, manatees that utilize both the sound and the waters around the docks encounter varying numbers and sizes of boats on a daily basis.

Special Status and Biology

Western Indian manatees are federally listed as threatened and listed as endangered by the state of Georgia. They are large aquatic mammals with paired flippers and a round, paddle-shaped tail. Adults are typically approximately 9 ft in length and weigh around 1,000 pounds. In coastal Georgia and Florida, manatees occur in freshwater, brackish, and marine environments. Their typical habitats in Georgia include coastal tidal rivers, creeks, freshwater springs, and tidal marsh edges where foraging on Spartina cordgrass (*Spartina alterniflora*) occurs. Survey work in the 2000s

estimated that during July, which is the peak time for manatees in the area, there were as many as 40 animals just in Cumberland Sound (Wolfe 2018). Manatees swim just below the surface and since Cumberland Sound is also a primary route for boats along the coastline, the manatees are at increased risk for boat strikes. Watercraft collisions were responsible for 25% of manatee mortalities documented in Georgia since 2000 (GA DNR 2018).

Manatees cannot survive prolonged exposure to water temperatures below 68 degrees Fahrenheit and in Georgia and northern Florida, manatees typically migrate south for winter in October. Their diet mainly consists of Spartina cordgrass in Georgia. Manatees are known to be intermittently active both day and night.

Threats to the Western Indian manatee include habitat loss and degradation and mortality from boat collisions. Manatees are slow moving and on average swim three to five miles an hour. Within the area of the national seashore, human-related threats include mortality and injury from collisions with watercraft and entanglement in fishing gear. Within Cumberland Sound, best management practices and education for both ferry captains and private boat drivers are important for the protection of Western Indian manatees. Natural threats include exposure to cold (loss of warm-water winter refuges) and exposure to red tide (*brevitoxicosis*) (USFWS 2007).

Eastern Black Rail

Field Reconnaissance

Eastern black rail is not currently known to exist on Cumberland Island. Recent studies have not located the black rail in proximity of the island, although coastal Georgia has been recognized as having the potential to support a breeding population (Watts 2016). However, both habitat types of salt and brackish marshes with dense cover and the upland areas of these marshes are present on the island and they have been documented historically. For these reasons, the Eastern black rail has the potential to occur and was carried forward for analysis.

Special Status and Biology

The Eastern black rail is federally listed as threatened. The secretive bird is the smallest rail in North America and is about the size of a sparrow with an average length of 4.0 to 6.0 inches and a wingspan of 8.7 to 11 inches.

Black rails require dense vegetative cover that allows them to move beneath the canopy. Their ability to live in a variety of salt, brackish, or freshwater marsh environments indicates that plant structure is more important than plant composition (USFWS 2022b).

Between 2010 and 2017, no credible records of black rail are known for Tennessee, Alabama, or Mississippi, and only a small number from Louisiana and Georgia. Major threats to black rails include habitat fragmentation, alteration, and conversion. They are also susceptible to climate change, disease, environmental contaminants, human disturbance, and altered food webs.

Piping Plover

Field Reconnaissance

The Atlantic Coast, Northern Great Plains, and Great Lakes watershed populations of piping plover have been documented by Audubon recorded sightings and surveys on the eastern, northern, and southern shoreline of Cumberland Island. The species is known to be present for up to 10 months of the year (typically from July to mid-May), but does not nest on the island. According to park staff

and local US Fish and Wildlife staff, the birds typically arrive at Cumberland Island in late June and migrate north in late April (Pers comm. Wikoff and Fry 2019). They can be seen in small groups or as individuals feeding between the high tide line and the surf. While they are known to occur up and down the eastern shoreline, they are more frequently found in low wave energy locations on the northern or southern tips of the island.

Special Status and Biology

The piping plover is a small migratory shorebird. The Atlantic Coast and Northern Great Plains populations of piping plover are federally listed as threatened and the Great Lakes watershed population is a federally listed endangered species when on their breeding grounds (and threatened elsewhere). The species is also listed as threatened by the state of Georgia. Designated critical habitat exists for all the present species populations along the northern, eastern, and southern shorelines of the island. Cumberland Island is considered wintering habitat for the piping plover and does not provide nesting habitat.

While at their wintering grounds, piping plovers spend most of their time foraging. They feed on exposed beach surfaces by pecking for invertebrates that are 1/2 inch or less below the surface. They feed mostly during the day and eat insects, marine worms, crustaceans, and mollusks as well as eggs and larvae of flies and beetles (USFWS 2019b).

Piping plover are threatened by destruction and degradation of habitat, shoreline erosion, human disturbance, and predation. Driving on beaches displaces piping plovers from preferred areas and can result in increased energy expenditure. In wintering sites, human disturbance has been shown to limit local piping plover abundance with dogs increasing the disturbance further. Disturbance also reduces the time piping plovers spend foraging, which has contributed to the long-term decline of migrating shorebirds at staging areas (USFWS 2019b).

The primary constituent elements of critical habitat are those physical or biological features essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support these habitat components. These elements are found in dynamic coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide (USFWS 2001). The units designated as critical habitat are those areas that have consistent use by piping plovers and that best meet the biological needs of the species. Primary constituent elements of wintering piping plover critical habitat include the following (USFWS 2001):

- Sand or mud flats, or both, with no or sparse emergent vegetation
- Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers
- Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Red Knot

Field Reconnaissance

Red knot have been documented on Cumberland Island. They prefer river mouth and tidal river areas, and flat tidal shorelines, but are known to feed along the entire stretch of beach. There is no

nesting habitat for red knot on the island. Abundance and location are believed to be related to the presence of dwarf surf clams and coquinas, a preferred food source along the Georgia coast. Feeding behavior can best be described as sporadic since birds are not normally observed feeding in the same area consistently. Preferred resting areas are the South End Beach below the St. Marys Entrance jetty and the northern tip of the island beach at Christmas Creek.

The barrier coast of Georgia, including Cumberland Island National Seashore, supports large numbers of red knots from about mid-July through May; in fall there can be as many as 10,000 birds at one time (Niles et al. 2008). According to investigations completed on red knot migration ecology along the Georgia coast (Smith et al. 2017), the patterns observed suggest that red knots are using the Georgia Coast during fall migrations in large numbers only when forage is abundant. Research suggests there is less variation in spring migration superpopulations between years than in fall migration, suggesting a more stable (but less abundant) food source for spring migrants (Smith et al. 2017).

Special Status and Biology

The red knot is federally listed as threatened. The shorebird is a large sandpiper that migrates long distances between nesting areas in the arctic and non-breeding areas along the coastal United States and farther south in South America. The red knot has different habitats for breeding, wintering, and migration. For wintering and migration habitats, the red knot prefers muddy or sandy coastal areas, such as Cumberland Island.

In Georgia, the peak of the red knot spring migration is from early to mid-April through late-May to early-June. Fall migration begins in mid-July and extends through October, and red knots are restricted to fewer stopover sites (NatureServe 2019). Fall coastal habitats in Georgia are used primarily by red knots wintering in southeastern states, coastal Texas, and into northeast Brazil, though long-distance migrant (wintering in Argentina and Chile) red knots refuel there as well (Smith et al. 2017).

Wood Stork

Field Reconnaissance

Wood stork rookeries were found throughout the island in the 1980s and in the Sweetwater Lakes/Lake Whitney as late as 2002 (Dlugolecki 2012, Person. Comm. 2019). However, currently, wood stork rookeries are no longer found on the island (Dlugolecki 2012, Person. Comm. 2019). The freshwater marsh, swamps, lagoons, ponds, and brackish wetland habitat of the island are still used as foraging grounds throughout the year but dry conditions and increased vegetative cover in areas has allowed predators to access former nesting areas that were previously protected by water (Dlugolecki 2012). Currently, wood storks are more likely to be present on the island when freshwater is available. Storks may forage twice a day in the marsh around the island when low tide concentrates prey in small pools left in tidal creek channels.

Prior to NPS takeover, open freshwater wetland landscapes were more common in the northern portion of the island and wood stork were more frequent in this habitat. Several factors contributed to this including regular burning of ponds and sloughs from Willow Pond to Lake Whitney to enhance waterfowl habitat and the presence of feral cows. Following the transfer of lands to the National Park Service, feral cattle were removed, naturally occurring fires were suppressed, and restoration work to wetlands that were diked for hunting and agriculture has not yet occurred. As a result, there has been little to keep woody vegetation from establishing and the wetlands have decreased in size and altered the freshwater wetland habitat that the wood stork utilizes (Dlugolecki 2012).

Special Status and Biology

The wood stork is a large, tall bird with long, broad wings and is federally listed as threatened. The birds are listed as endangered by the state of Georgia. Their primary habitat consists of freshwater marshes, swamps, lagoons, ponds, and flooded fields. The diet primarily consists of fish, but also includes other small animals they detect using their touch-sensitive bill. They forage primarily in shallow water and flooded fields and may travel long distances between nesting and feeding areas when they are feeding their young (NatureServe 2019).

Wood storks are threatened by the disruption and drainage of wetlands, which affects both their nesting sites and food supply in feeding areas (NatureServe 2019). Additional loss of habitat stems from logging and development and human disturbance can cause adults to leave their nests, increasing the exposure of their eggs and young to predators.

Monarch Butterfly

Field Reconnaissance

A butterfly inventory conducted in the park in 2010 and 2011 identified the monarch butterfly as one of 37 species found (Minno 2011). Single adults were identified in numerous locations across the island. The museum contains a collection of approximately a dozen monarchs that were collected from the southern part of the island in 1981 (Hoffman Pers. Comm. 2022).

While a butterfly inventory has not been conducted on the island in the past 10 years, the monarch is ranked as being secure in Georgia and their continued presence on the island is presumed.

Special Status and Biology

The black and orange monarch is one of the most recognizable butterfly species in North America and are known for their long migration.

The key components for monarch habitat include milkweed and flowering plants. Adult monarchs will feed on the nectar of numerous flower species during breeding and migration, but they can only lay their eggs on milkweed plants (USFWS 2022c).

For overwintering monarch butterflies, a specific microclimate is needed for protection from the elements and to avoid freezing. For the eastern North American populations, most monarchs overwinter in oyamel fir tree roosts located in mountainous regions in central Mexico.

Monarchs are threatened by loss of habitat, climate change, and the use of agricultural pesticides and herbicides that impact milkweed species, which are key to the monarch's survival.

Gopher Tortoise

Field Reconnaissance

It is suspected that the tortoises were brought to Cumberland Island by residents to be used as food decades ago. The population has been studied in recent years and in 2015, it was estimated there were 150 to 175 tortoises living on the island (Soergel 2015). The known range of the gopher tortoise population on Cumberland extends from Stafford field southward to the Greyfield Inn property. Habitat types in this range include open field, open lawns associated with residential buildings, oak-pine forest, oak-palmetto forest, and a 50+ acre pine plantation.

Special Status and Biology

The tortoise are a federal candidate and Georgia State threatened species that inhabits well-drained sandy soils with sufficient herbaceous vegetation for food and sunny areas for nesting. They primarily eat grasses and other plants but will also eat fruits, carrion, and insects. The tortoise prefers open habitat with a wide variety of ground cover vegetation for forage. Prescribed burns on Cumberland Island have benefited the species by maintaining more of an herbaceous grassland vegetation habitat that is attractive to the species (Jacksonville University 2019). Since prescribed burns on the island began in 2016, populations of the gopher tortoise have increased, especially in the Stafford woods area of the island.

Gopher tortoises dig deep burrows that provide shelter and protect them from predation. Their burrows also provide shelter for numerous other species. The burrows also protect them from desiccation.

Primary threats to the tortoise include urban development, agricultural conversion, and habitat fragmentation. These threats are not as prevalent within the national seashore and as such, the tortoise population on Cumberland Island is growing.

Carolina Gopher Frog

Field Reconnaissance

Carolina gopher frogs have not been documented on Cumberland Island. However, gopher tortoises are known to be present on the island and the gopher frogs are known to take shelter in the burrows of gopher tortoises (Roznik and Johnson 2017). The island does provide both their predominant native xeric upland habitat and ephemeral to semi-permanent freshwater wetlands. For these reasons, the gopher frog has the potential to occur and was carried forward for analysis.

Special Status and Biology

The gopher frog is a federal candidate and is listed as rare by the State of Georgia. The stocky frog can grow to between 2.4 to 3.5 inches. They are typically light to dark brown with blotches and warts, which gives them the appearance of a toad.

Adult gopher frogs spend most of their time underground in terrestrial native longleaf pine, xeric oak, and sandhill habitats, but also occurs in upland pine forest, scrub, xeric hammock, mesic and scrubby flatwoods, dry prairie, mixed hardwood-pine communities, and a variety of disturbed habitats (FL FWCC 2019). They typically occupy rodent burrows, crayfish holes, root channels, and gopher tortoise burrows. Their diet primarily consists of invertebrates and other frogs and toads. The frogs move to temporary or semi-permanent freshwater wetlands to breed, sometimes traveling up to a mile or more, and deposit eggs in late winter. These breeding ponds are typically isolated from flowing streams, but will occasionally have an outflow if heavy rains fill these areas above the full pool level. Their single egg mass can contain 3,000 to 7,000 eggs, which attach to vegetation when released (FL FWCC 2019). The aquatic larvae can spend up to several months in a breeding pond before they metamorphosis into adults. They then move to their upland habitat and only return to the breeding ponds upon reaching reproductively maturity (USFWS 2016).

Major threats to gopher frogs include the alteration or conversion / development of wetlands in addition to the suppression of fire in longleaf pine forests. Commercial and residential development and the conversion of longleaf forests to loblolly pine plantations also threaten the species by eliminating their habitat (USFWS 2016).

Green Sea Turtle

Field Reconnaissance

While green sea turtles rarely nest in Georgia, Cumberland Island does provides seasonal nesting habitat and turtle nest totals at the national seashore have shown a general increasing trend. Only two nesting events were recorded prior to 2008 where more recent data from 2009-2017 confirm 34 nests from this species, with annual nesting events ranging from 0 to 14 nests and 11 nests documented in the summer of 2019 by the national seashore's turtle monitoring program (NPS 2018, NPS 2019a).

Special Status and Biology

The green sea turtle is federally listed as threatened. The turtle is also listed as threatened by the state of Georgia. They are a long distance migratory sea turtle known to migrate up to 1,865 miles between nesting beaches and feeding areas.

Green sea turtle nesting generally occurs at night, on beaches, and typically on islands. Most nesting occurs on high energy beaches with deep sand. Cumberland Island provides nesting habitat for a small population of green sea turtles. At least in some regions, individuals generally nest at the same beach in successive nestings, though individuals sometimes change to a different nesting beach within a single nesting season. Beach development and illumination often make beaches unsuitable for successful nesting.

Individual reproductive females lay 1-8 clutches per season, averaging about 90-140 eggs, at about two-week intervals usually every 2-5 years. Nesting in the Cumberland Island vicinity typically occurs between May and September with eggs hatching in about 1.5-3 months. (Ehrhart and Witherington 1992). The eggs and hatchlings are highly susceptible to mortality from a variety of terrestrial and aquatic predators. In addition, many nests are destroyed by tidal inundation and erosion.

Major threats vary across the green sea turtle's range, but along the Georgia coastline include degradation of nesting habitat, including beach lighting which can disorient hatchlings and/or nesting females; predation on eggs and hatchlings by raccoons, dogs, etc.; mortality in fishing gear and other entangling debris; collisions with power boats; contact with chemical pollutants; and epidemic outbreaks (NatureServe 2019).

Hawksbill Sea Turtle

Field Reconnaissance

While Hawksbill turtles do not nest on Cumberland Island or the state of Georgia, they are infrequently found in Georgia coastal waters. Park staff have documented two strandings of hawksbill turtles on Cumberland Island during monitoring for other nesting sea turtle species. Hawksbills feed on sponges and other invertebrates and tend to nest farther south in pantropical waters on small, isolated beaches (GA DNR 2022).

Special Status and Biology

The hawksbill sea turtle is a relatively small turtle that is federally listed as endangered. Their diet primarily includes invertebrates (crabs, sea urchins, shellfish, jellyfish, etc.) but they are also known to eat plant material and fishes. Their foraging habitat includes bottom and reef faces close to shore.

The hawksbill uses a wide range of tropical and subtropical habitats including estuaries. Hatchlings and young turtles are found with masses of floating sea plants in open ocean waters (NatureServe 2022). As adults, they migrate hundreds to thousands of miles between feeding areas and their nesting beaches.

They have been hunted historically for their beautiful shell and commercial and subsistence harvest remains their greatest threat. Other threats include destruction and degradation of breeding habitat, light pollution, exposure to contaminants, and entanglement in marine debris. Also, climate warming and imperfect egg hatchery strategies may be increasing bias in sex ratios (NMFS and USFWS 2007), but the overall severity of this threat is uncertain (NatureServe 2022).

Kemp's Ridley Sea Turtle

Field Reconnaissance

Kemp's ridley sea turtle nests have been documented on Cumberland Island, although rarely. Kemp's ridley sea turtle nesting data for Cumberland Island National Seashore from 2009 to 2019 recorded two nesting events, both in 2017 (GA DNR 2019).

Special Status and Biology

The Kemp's ridley sea turtle is listed as endangered under the ESA and as "critically endangered" by the International Union for Conservation of Nature (IUCN) due to steep populations declines after 1945 (Wibbels, T. & Bevan, E. 2019; NMFS and USFWS 2015). It is also listed as a species of special concern in Georgia.

The Kemp's ridley sea turtle has one of the most restricted distributions of any sea turtle species (Morreale et al. 2007). It is commonly found throughout the southeast region of the U.S., but adult turtles are thought to primarily inhabit the Gulf of Mexico, while juveniles and subadults also regularly occur along the eastern seaboard of the United States and Canada.

Nesting occurs almost exclusively on the beaches of the western Gulf of Mexico (NMFS et al. 2010). In the United States, most nesting takes place in Texas (Shaver and Caillouet 2015), but infrequent nesting has been documented in Alabama, Florida, Georgia, South Carolina, and North Carolina (NMFS and USFWS 2015). Kemp's ridley nests have been recorded at Cumberland Island in low numbers. Nesting occurs mainly from April to July, and adult females may nest up to three times per season (NMFS and USFWS 2015). Eggs incubate for approximately 42 to 62 days before hatching. The time between nesting varies but is estimated to be about two years. Sea turtle stranding records suggest that juvenile Kemp's Ridleys are present off the Georgia coast from April through October annually with few existing in the area during the winter months (Ozier et al., 1999). Cumberland Island typically documents several Kemp's strandings each year.

Kemp's ridley populations are threatened by the public harvesting eggs from the nest, accidental capture in fishery trawls, loss or degradation of nesting habitat, and sea level rise (NMFS and USFWS 2015). Nest depredation by mammals and ghost crabs poses a serious threat to marine turtle populations.

Leatherback Sea Turtle

Field Reconnaissance

Leatherback sea turtle nests have been documented on Cumberland Island, although rarely. Leatherback sea turtle nesting data for Cumberland Island National Seashore from 1981 to 2008

recorded five nesting events. Over the past 10 years, there have been 10 leatherback nests recorded on Cumberland Island by the Georgia Department of Natural Resources Sea Turtle Conservation Program (2019), which monitors nests on the island. The largest number of nests (five) were recorded in 2011 and several years saw no recorded leatherback nests, including 2019 (GADNR 2019; NPS 2018).

Special Status and Biology

Leatherback sea turtles are the largest marine turtle and are federally and state-listed as endangered. The leatherback is the only sea turtle species without scales and a hard shell. They are a long distance migratory sea turtle known to migrate thousands of miles between nesting beaches and feeding areas. They primarily eat jellyfish but will eat other invertebrates, fish, and seaweed at times. They can dive to depths of nearly 4,000 feet and spend most of their time submerged (NOAA 2019a).

Leatherback sea turtles spend most of their time at sea seldom approaching land except to nest. Nesting generally occurs at night, on beaches in the Western Hemisphere between March and August. Most nesting occurs on high energy sloping sandy beaches that are backed up by vegetation and near deep water. Beach development and illumination often make beaches unsuitable for successful nesting.

Individual reproductive females lay up to 10+ clutches per season, averaging about 50-170 eggs, at about two-week intervals usually every 2-3 years. Eggs hatch in 8-10 weeks (NatureServe 2019). The eggs and hatchlings are highly susceptible to mortality from a variety of terrestrial and aquatic predators. In addition, many nests are destroyed by tidal inundation and erosion.

Major threats vary across the leatherback sea turtle's range, but along the Georgia coastline they include coastal development, beach armoring, dredging, and beachfront lighting which can disorient hatchlings and/or nesting females. Eggs and hatchlings incur high rates of mortality from predation and adults often die from drowning in commercial fishing nets and from eating floating debris, especially plastic. Vessel strikes can also injure or kill leatherback sea turtles.

Loggerhead Sea Turtle

Field Reconnaissance

Cumberland's 18-mile undeveloped beach is one of the most important loggerhead sea turtle nesting areas in Georgia (NPS 2019a). Each year it accounts for 25 to 30 percent of the statewide nesting total. In the last 3½ seasons, Cumberland has produced more than 1,800 nests (NPS 2019a). In 2019, there were more than 1,000 loggerhead nests documented by the Georgia Department of Natural Resources Sea Turtle Conservation Program (2019), which was the largest number of nests since 2016 when 866 nests were recorded. Nesting data for the island shows an average of 226 nests per year from 2000 to 2009 and 552 nests per year from 2010 to 2017 (over a two-fold increase); hatch success has been stable for the previous 17 years, impacted only by occasional major storm events (NPS 2018).

Special Status and Biology

Loggerhead sea turtles are a federally threatened species and a state species of concern. They are the most abundant sea turtle species found in U.S. Atlantic coastal waters. Designated critical habitat for the loggerhead exists along the entire eastern shoreline of the island and wrapping around the northern and southern tips. They are carnivores that eat plants occasionally. In the Atlantic Ocean, the hatchling turtles consume small animals that live within floating sargassum seaweed, which is

where they spend much of their early development years. Juveniles and adults consume mostly bottom dwelling invertebrates such as mollusks, horseshoe crabs, and sea urchins.

Loggerhead sea turtles can live more than 75 years and females do not reach maturity until approximately 35 years of age. The turtles mate every 2-3 years in coastal waters and return to the beaches where they hatched to nest. Around Cumberland Island, in the northern hemisphere, mating occurs in late March to early June and females lay eggs between late April and early September. Females typically lay three to five nests during a single nesting season and the eggs hatch approximately two months later between late June and mid-November (NOAA 2019b).

Loggerheads spend the first 7 to 15 years of life in the open ocean and then migrate to nearshore coastal areas. Cumberland Island provides nesting habitat for the loggerhead and its offshore waters provide coastal areas for hatched juveniles and migrating adults. The Georgia coastline provides foraging habitat and inter-nesting habitat for the species. They are carnivores, only occasionally consuming plant material. In the Atlantic and Gulf of Mexico hatchlings feed on small animals living in floating seaweed called Sargassum, where they spend their early developmental years. Juveniles and adults eat mostly bottom dwelling invertebrates such as whelks, other mollusks, horseshoe crabs, and sea urchins. Their powerful jaws are designed to crush their prey.

The primary threat to loggerhead sea turtles worldwide is bycatch in fishing gear, primarily in trawls, longlines, and gillnets. Within the area of Cumberland Island, other threats include ingesting ocean debris and becoming entangled in ocean pollution.

Primary constituent elements of loggerhead designated critical habitat include the following (USFWS No Date):

- Suitable nesting beach habitat that has (a) relatively unimpeded near shore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings; and, (b) is located above mean high water to avoid being inundated frequently by high tides.

- Sand that (a) allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) is able to develop and maintain temperatures and moisture content conducive to embryo development.

- Suitable nesting beach habitat with sufficient darkness to ensure nesting turtles are not deterred from emerging onto the beach, post-nesting females reorient back to the sea and emerging hatchlings orient correctly towards the sea.

- Natural coastal processes or artificially created or maintained habitat mimicking natural conditions. This includes artificial habitat types that mimic the natural conditions described in the primary constituent elements above for beach access, nest site selection, nest construction, egg deposition and incubation, and hatchling emergence and movement to the sea.

Atlantic Sturgeon

Field Reconnaissance

Atlantic sturgeon are a migratory species that hatch in freshwater rivers, head out to sea as juveniles, and return to their birthplace as adults to spawn or lay eggs. Migrant sturgeon are known to occur in

the St. Marys River main stem north of Cumberland Island and seasonally within Cumberland Sound between Cumberland Island and mainland Georgia (Fox et al. 2018).

Special Status and Biology

Atlantic sturgeon are a federally endangered species that live in rivers and coastal waters on the Atlantic coast between Canada and Florida. They are a slow growing fish and have been known to reach up to 14 feet in length and live for up to 60 years in Canada, but typically only 25-30 years in the southeast (NOAA 2019c). Atlantic sturgeon are bottom feeders. They consume invertebrates such as crustaceans, worms, and mollusks, as well as bottom-dwelling fish such as sand lance (NatureServe 2019).

In rivers from Georgia to the Chesapeake Bay, scientists have confirmed that adult sturgeon spawn during the late summer and fall (NOAA 2019c). In a recent study, 20 migrant Atlantic Sturgeon were detected within the lower St. Marys River and Cumberland Sound. The number and seasonal presence of sturgeon indicate that the St. Marys River estuary may be an important seasonal habitat for the species, particularly for non-spawning, migratory life stages. Most of the migrant individuals were only detected within Cumberland Sound and not within St. Marys River and few to no migrant sturgeon were detected during the warmest months (June – November) of the year (Fox et al. 2018). Male Atlantic sturgeon spawn every 1 to 5 years and return almost every year while females spawn every 2 to 5 and typically return every other or every third year. Female egg production correlates with age and body size, and ranges from 400,000 to 1.6 million eggs (NatureServe 2019). Once they hatch, larvae hide on the river bottom and drift downstream until they reach brackish waters. They may reside there for 1-5 years before moving into deeper nearshore coastal waters. Tagging data indicate that these immature Atlantic sturgeon travel widely once they leave their birth rivers (NatureServe 2019).

Threats to Atlantic sturgeon include unintended catch in commercial fisheries, dams that block migration to spawning areas, poor water quality, dredging in spawning areas, water withdrawals from rivers, and vessel strikes.

Shortnose Sturgeon

Field Reconnaissance

The shortnose sturgeon is a unique fish that looks as though it is covered in armor. They were considered extinct in the vicinity of Cumberland Island, but were recently found again in both the Satilla and St. Marys rivers, which are west of the island at the northern and southern ends, respectively (NOAA 2019d).

Special Status and Biology

Shortnose sturgeon are a federally endangered species that live in rivers and coastal waters on the Atlantic coast between Canada and Florida. They are a slow growing fish and have been known to reach up to 4.5 feet in length and live for up to 60 years in Canada, but typically only 10-20 years in the southeast (NOAA 2019d). Shortnose sturgeon use four whisker-like barbels that protrude from their mouths to search for food in the sandy, muddy bottom of rivers. Their mouths work like a vacuum to suck up bottom-dwelling food, typically eating invertebrates such as insects, crustaceans, worms, and mollusks (NOAA 2019d).

In the South, spawning adults generally migrate upriver in the spring between January and April (NOAA 2019d). Male shortnose sturgeon spawn every 1 to 2 years while females spawn every 3 to 5. Female egg production correlates with age and body size, and ranges from 30,000 to 200,000 per year

(NOAA 2019d). They hatch in freshwater rivers and spend most of their lives in the estuaries of these rivers. During their lifespan, they spend little time in the ocean and typically stay nearshore when they do enter marine waters. In the spring, adults move far upstream to freshwater to spawn and rapidly return to the estuaries once spawning is complete.

Threats to shortnose sturgeon include dams that block access to spawning areas, poor water quality, dredging in spawning areas, dredging, water withdrawals from rivers, and unintended catch from commercial fishing.

ESSENTIAL FISH HABITAT

Cumberland Island is bordered by essential fish habitat for the following species:

- Juvenile lifestage of windowpane flounder
- All lifestages of coastal migratory pelagics (king mackerel, Spanish mackerel, cobia)
- All lifestages of spiny lobster (2 species)
- All lifestages of snapper grouper
- All lifestages of basking shark (only the eastern shoreline of the island)
- Juvenile / adult stages of bull shark
- All lifestages of spinner shark
- Adult/juvenile lifestages of lemon shark
- Adult/juvenile lifestages of sandbar shark
- All lifestages of scalloped hammerhead shark
- All lifestages of tiger shark
- All lifestages of blacktip shark (Atlantic stock)
- Juvenile/adult lifestages of blacknose shark (Atlantic stock)
- All lifestages of Atlantic sharpnose shark (Atlantic stock)
- All lifestages of bonnethead shark
- All lifestages of finetooth shark
- All lifestages of sand tiger shark
- All lifestages of bluefish
- All lifestages of Atlantic butterfish
- All lifestages of summer flounder
- All lifestages of sandbar shark

Because there are no proposed in-water actions, there would be no impacts to essential fish habitat and this topic was not carried forward for analysis.

MIGRATORY BIRDS

Also of concern to natural resource managers are migratory birds, addressed under the Migratory Bird Treaty Act (16 USC § 703-712 2012). This act protects migratory birds, their parts, and nests or eggs from taking, except as permitted. Migratory birds include raptors, songbirds, and shorebirds that breed in North America but migrate to Mexico, Central America, or South America for the winter. In general, peak migration periods generally occur in May and from September through early October. Nesting and brood rearing typically occurs between April and October, with a few exceptions.

Because of the wide variation in habitat types and proximity to the Atlantic coastline, the diversity of bird species is high, especially for migratory species and others using shoreline habitats. Most birds are protected under the Migratory Bird Treaty Act, while eagles are protected under the Bald and Golden Eagle Protection Act. The US Fish and Wildlife Service identified 55 birds in the action area that are of particular concern because they occur on the USFWS Birds of Conservation Concern list or warrant special attention in the project location (USFWS 2019a). They are presented below in table G-5.

TABLE G-5. MIGRATORY BIRD SPECIES FOR CUMBERLAND ISLAND

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
American Kestrel Falco sparverius Paulus	Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Apr 1 to Aug 31	Known to occur in the national seashore.
American Oystercatcher Haematopus palliatus	BCC Rangewide (Continental US and Alaska)	April 15 to Aug 31	Known to occur in the national seashore. Georgia coast, including Cumberland, also supports flocks of oystercatchers throughout the winter.
Bachman's Sparrow Aimophila aestivalis	BCC Rangewide (continental USA and Alaska)	May 1 to Sep 30	Known to occur in the national seashore.
Bald Eagle Haliaeetus leucocephalus	Non-BCC Vulnerable	Sep 1 to Jul 31	Known to occur and nest in the national seashore. Multiple eagles, typically family groups, are seen along the island coastline from late August through October.
Black Scoter Melanitta nigra	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Black Skimmer Rynchops niger	BCC Rangewide (Continental US and Alaska)	May 20 to Sep 15	Known to occur in the national seashore.
Bonaparte's Gull Chroicocephalus philadelphia	Non-BCC Vulnerable	Breeds elsewhere	Has not been recorded in the national seashore.
Brown Pelican Pelecanus occidentalis	Non-BCC Vulnerable	Jan 15 to Sep 30	Known to occur in the national seashore.
Brown-headed Nuthatch *Sitta pusilla*	BCC only in particular BCRs	Mar 1 to July 15	Known to occur in the national seashore.
Chimney Swift Chaetura pelagica	BCC Rangewide (Continental US and Alaska)	Mar 15 to Aug 25	Known to occur in the national seashore.

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
Clapper Rail Rallus crepitans	BCC only in particular BCRs	Apr 10 to Oct 31	Known to occur in the national seashore.
Common Eider Somateria mollissima	Non-BCC Vulnerable	Jun 1 to Sep 30	Has not been recorded in the national seashore.
Common Ground-dove Columbina passerina exigua	BCC only in particular BCRs	Feb 1 to Dec 31	Known to occur in the national seashore.
Common Loon Gavia immer	Non-BCC Vulnerable	Apr 15 to Oct 31	Known to occur in the national seashore.
Common Tern Sterna hirundo	Non-BCC Vulnerable	May 10 to Sep 10	Known to occur in the national seashore.
Double-crested Cormorant Phalacrocorax auritus	Non-BCC Vulnerable	Apr 20 to Aug 31	Known to occur in the national seashore.
Dunlin Calidris alpina arcticola	BCC only in particular BCRs	Breeds elsewhere	Known to occur in the national seashore.
Eastern Whippoor-will Antrostomus vociferus	BCC Rangewide (Continental US and Alaska)	May 1 to Aug 20	Has not been recorded in the national seashore.
Great Black-backed Gull Larus marinus	Non-BCC Vulnerable	Apr 15 to Aug 20	Known to occur in the national seashore.
Gull-billed Tern Gelochelidon nilotica	BCC Rangewide (Continental US and Alaska)	May 1 to Jul 31	Known to occasionally occur in the national seashore.
Herring Gull Larus argentatus	Non-BCC Vulnerable	Apr 20 to Aug 31	Known to occur in the national seashore.

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
King Rail Rallus elegans	BCC Rangewide (Continental US and Alaska)	May 1 to Sep 5	Known to occur in the national seashore.
Le Conte's Sparrow Ammodramus leconteii	BCC only in particular BCRs	Breeds elsewhere	Known to occur in the national seashore.
Least Tern Sterna antillarum	BCC only in particular BCRs	Apr 20 to Sep 10	Known to occur in the national seashore. Least tern nesting on Cumberland is variable each year, with potential colony sites including the dunes adjacent to the North Cut road access and the sand flats located on the north and south ends of the island.
Lesser Yellowlegs Tringa flavipes	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Long-tailed Duck (Oldsquaw) Clangula hyemalis	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Magnificent Frigatebird Fregata magnificens	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Manx Shearwater Pufinus pufinus	Non-BCC Vulnerable	Apr 15 to Oct 31	Has not been recorded in the national seashore.
Marbled Godwit Limosa fedoa	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Nelson's Sparrow Ammodramus nelsoni	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Northern Gannet Morus bassanus	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Painted Bunting *Passerina ciris*	BCC only in particular BCRs	Apr 25 to Aug 15	Known to occur in the national seashore.

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
Parasitic Jaeger Stercorarius parasiticus	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Pomarine Jaeger Stercorarius pomarinus	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Prairie Warbler Dendroica discolor	BCC Rangewide (Continental US and Alaska)	May 1 to Jul 31	Known to occur in the national seashore.
Prothonotary Warbler Protonotaria citrea	BCC Rangewide (Continental US and Alaska)	Apr 1 to Jul 31	Known to occur in the national seashore.
Purple Sandpiper Calidris maritima	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Razorbill Alca torda	Non-BCC Vulnerable	Jun 15 to Sep 10	Known to occur in the national seashore.
Red-breasted Merganser Mergus serrator	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Red-headed Woodpecker Melanerpes erythrocephalus	BCC Rangewide (Continental US and Alaska)	May 10 to Sep 10	Known to occur in the national seashore.
Red-throated Loon Gavia stellata	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Ring-billed Gull Larus delawarensis	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Royal Tern Thalasseus maximus	Non-BCC Vulnerable	Apr 15 to Aug 31	Known to occur in the national seashore.

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
Ruddy Turnstone Arenaria interpres morinella	BCC only in particular BCRs	Breeds elsewhere	Known to occur in the national seashore.
Seaside Sparrow Ammodramus maritimus	BCC Rangewide (Continental US and Alaska)	May 10 to Aug 20	Known to occur in the national seashore.
Semipalmated Sandpiper Calidris pusilla	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Short-billed Dowitcher Limnodromus griseus	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
Surf Scoter Melanitta perspicillata	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Swallow-tailed Kite Elanoides forficatus	BCC Rangewide (Continental US and Alaska)	Mar 10 to Jun 30	Known to occur in the national seashore.
Thick-billed Murre Uria lomvia	Non-BCC Vulnerable	Apr 15 to Aug 15	Has not been recorded in the national seashore.
Whimbrel Numenius phaeopus	BCC Rangewide (Continental US and Alaska)	Breeds elsewhere	Known to occur in the national seashore.
White-winged Scoter Melanitta fusca	Non-BCC Vulnerable	Breeds elsewhere	Known to occur in the national seashore.
Willet Tringa semipalmata	BCC Rangewide (Continental US and Alaska)	Apr 20 to Aug 5	Known to occur in the national seashore.

Common Name *Scientific Name*	Conservation Status	Breeding Season	Presence Notes
Wilson's Plover Charadrius wilsonia	BCC Rangewide (Continental US and Alaska)	Apr 1 to Aug 20	Known to nest annually on Cumberland Island. Nesting occurs along the entire length of beach from south of the St. Marys Entrance jetty to the northernmost dunes at Christmas Creek.
Wood Thrush Hylocichla mustelina	BCC Rangewide (Continental US and Alaska)	May 10 to Aug 31	Known to occur in the national seashore.

There is a growing body of scientific evidence indicating that human activity and recreation will modify habitat selection by birds. For species that are sensitive to human disturbance, the intensity and duration of human activity will negatively influence shoreline use by these birds (Meager et al. 2012). Depending on the proportion of human activity, shorebirds will exhibit an increasing avoidance of habitats they would normally select in areas lacking human presents or with low human densities. Contingent on how widespread human activity is in a given area, the avoidance of habitat will affect sensitive species' access to those conditions that influence their fitness and capacity to thrive.

ENVIRONMENTAL BASELINE

As defined under the ESA, the environmental baseline includes past and present impacts of all federal, state, and private actions in the action area; the anticipated impacts of all proposed federal actions in the action area that have already undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the section 7 consultation process. Future actions and their potential effects are not included in the environmental baseline. This section in combination with the previous section defines the current status of the species and its habitat in the action area and provides a platform to assess the effects of the proposed action under consultation with the USFWS.

Previous Consultation with the USFWS within the Study Area

Table G-6 describes all past completed section 7 consultation that have previously occurred within the study area.

TABLE G-6. PAST CONSULTATION WITH THE USFWS AND DETERMINATIONS FOR ACTIONS WITHIN THE ACTION AREA FOR ALL FEDERALLY LISTED/PROPOSED SPECIES AND DESIGNATED/PROPOSED CRITICAL HABITAT (CH)

Project	Species Addressed	Determination[1]	Date
Stabilization of Dungeness Ruins	No species present at site of ruins	NE	2004
Fire Management Plan and Environmental Assessment	Red cockaded woodpecker Piping plover Wood stork Eastern indigo snake Gopher tortoise	BE	2013

Project	Species Addressed	Determination[1]	Date
	Loggerhead sea turtle		
Coastal Species of Concern Predation Management Plan and Programmatic Environmental Assessment	Green sea turtle Kemp's ridley sea turtle Leatherback sea turtle Loggerhead sea turtle Piping plover Red knot	NLAA	2018

[1]NE = No Effect; BE=Beneficial Effect; NLAA=Not Likely to Adversely Affect

Past, Current, and Reasonably Foreseeable Activities with the Potential to Affect the Study Area

Past, current, and reasonably foreseeable activities within proximity of the action area include:

National Seashore Operations, Resource Management, and Monitoring

Previous, ongoing, and future management operations at the national seashore include invasive species management, fire management, trail maintenance, and response to natural disasters. These activities occur throughout the national seashore, as appropriate, and vary season to season and year to year depending on conditions. In addition, several annual monitoring programs for shorebirds and nesting sea turtles occur on the island annually. These programs utilize staff, researchers, and/or volunteers to track species, nesting locations, and nesting success rates. Under the sea turtle program, interns locate nests; monitor them; and protect them from tidal washovers and predation; and finally inventory them after hatching to evaluate success. The park's sea turtle monitoring program consists of daily patrols from May 1st through October 30th each year.

Hurricane Damage Repair

Ongoing and future repairs of existing damaged boat docks and associated facilities both on Cumberland Island and on the Georgia mainland at St. Marys. Sea Camp and Dungeness docks on the western shore of Cumberland Island were damaged by Hurricane Matthew in 2016. Hurricane Irma in 2017 caused damage to the park's ferry dock in St. Marys, Georgia, which is west of the island and the departure point for the Cumberland Island ferry.

Mainland Dock Expansions

Future plans for the expansion of the St. Marys Gateway Dock will include three phases of construction to add additional docking slips. In addition, the Wharf at St. Marys project also proposes new docking facilities within the coastal city of St. Marys. The project will consist of approximately 52 acres subdivided out as a mixed-use wharf to include dry dock storage, a boatyard, docking facilities, boat repair, and mixed-use commercial with a residential component.

Ongoing Visitor and Resident Use of Motorized Boats and Vehicles Around the National Seashore

Previous, ongoing, and future use of and access to the national seashore by visitors and residents includes the use of motorized and non-motorized boats and, for residents, the use of vehicles on the roads and beaches (in accordance with Georgia State regulations).

Spaceport Camden Project

Camden County is in the process of gaining approvals to begin construction and operations at Spaceport Camden, a proposed commercial spaceport near the city of Woodbine, GA. The launch site is approximately 3.5 west of Terrapin Bluff, part of designated wilderness in the northwest portion of the island. If constructed, the Federal Aviation Administration (FAA) would issue a Launch Site Operator License to Camden County to operate the spaceport. Camden County proposes to offer the site for up to 12 annual launches of liquid-fueled, small, orbital and suborbital vertical launch vehicles. Camden County proposes landing the first stage of some vehicles at the spaceport site or on a barge approximately 200 to 300 miles off-shore in the Atlantic Ocean.

EFFECTS TO EVALUATED SPECIES AND DETERMINATIONS

West Indian Manatee

Direct and Indirect Effects

Under the preferred alternative, if implemented, expansion of the ferry service would result in passenger ferries regularly traveling farther north within Cumberland Sound to Brickhill River. In addition, extending the season for mid-afternoon departures and potentially extending the hours of operation during the summer season would result in passenger ferries being present within a greater extent of the sound later in the season and later in the day. Manatees congregate at the boat docks on the western shore of the island because they are drawn to shallow waters and the margins of nearby marshes to feed.

According to mortality data from the Manatee Carcass Salvage Program, the leading cause of manatee injuries and deaths in Florida, which is immediately south of Cumberland Island, are boat collisions (USFWS 2007). The increased ferry service would overlap the season when manatees are most likely to be in the waters around Cumberland Island (April through October) and therefore, the risk of boat collisions and visitor interactions with manatees would slightly increase during these months resulting in a slight adverse impact to individual manatees.

The availability of kayak/canoe rentals on the island could increase the number of interactions between kayakers and manatees in the vicinity of the island; however, kayaking around the island and kayak camping is currently allowed and the national seashore sits at the southern end of the already established Southeast Coast Saltwater Paddling Trail, which covers 800 coastal miles between Virginia and Georgia. Kayaks do not have motorized propellers, are light and shallow-hulled watercraft, move at a slower, human-propelled speed, and therefore, do not pose a collision threat to manatees. If kayak rentals were placed in close proximity to areas where manatees are known to congregate, staff would identify and designate a zone on the beach where renters could safely enter and exit the water without disturbing the manatees. Kayak renters would be educated on safe distances to maintain from the animals to ensure their protection and minimize the potential for disturbance.

Manatees are also known to frequent the tidal marsh areas of Beach Creek. While powerboats frequently access Beach Creek now, they typically stay within the deeper channels. The establishment of the Beach Creek campsite could slightly increase the use of powerboats in the area and their frequency to approach shallower water around the campsite, especially within the first half-mile approach to the campsite from the southern inlet.

These increased risks for vessel collisions and disturbance would be mitigated by additional educational signage around the docks and installation of signage in areas, such as Beach Creek, where manatees are known to congregate. Vessel speed would be posted and further enforced around the ferry landing docks and no-wake zones would be posted in areas, including Beach Creek, resulting in beneficial impacts to manatees. In addition, park staff would encourage slower motorized boat speeds and actively educate visitors on the do's and don’ts regarding sensitive species and areas. Ferry service operators currently follow boater best management guidelines when operating the ferries, which include for example, keeping their vessels in deeper water whenever possible, operating at a no-wake speed when approaching the docks, having a look out for manatees around known congregation areas, wearing polarized glasses to reduce glare, and avoiding passing directly over visible manatees. These same guidelines would be followed for expanded ferry services and routes. To date, there has not been a recorded manatee collision by the ferries traveling to the national seashore. With the implementation of these mitigation measures, the risk to individual manatees would be minimized.

Figure G-2: Signs for boaters and a manatee at the docks of Cumberland Island

Cumulative Effects

Previous, ongoing, and future repairs of the Sea Camp and Dungeness docks on the western shore of Cumberland Island have and will continue to contribute noise and disturbance to West Indian Manatees, resulting in short-term adverse impacts.

During construction of the expansion of the St. Marys Gateway Dock and the wharf at St. Marys, there could be impacts to manatees from noise and disturbance to aquatic habitat in the vicinity of these areas.

Effect Determination

There are no in-water proposed actions and there is no in-water construction required to accommodate the expanded ferry service and therefore no impacts to West Indian manatee habitat. Educational signage, increased enforcement around the ferry docks, increased visitor and boater

education, and the continued application of ferry operator best management guidelines would reduce the slight increased risk for boat collisions and disturbance to manatees. Therefore, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** the West Indian manatee.

Eastern Black Rail

Direct and Indirect Effects

There are no proposed actions in the freshwater marsh, swamps, and brackish wetland habitat of the island that would serve as habitat for the black rail. Freshwater emergent wetland habitat is more abundant in the northern portion of the island. The new Sweetwater Lakes campsite would not be placed in this habitat, but it would be located along the trail approximately 250 feet from nearby freshwater emergent wetlands. The creation of this campsite, coupled with expanded ferry service to Plum Creek, which is closer to this area of the park, could increase use of the Roller Coaster Trail that traverses nearer to this habitat for the black rail. There is also potential habitat near the Brickhill River and associated marsh. The potential increased presence of people in these areas that could be used by the black rail could increase disturbance to these species beyond what is currently experienced, depending on the location of this group of people and their activities. However, there are no trails or amenities that would draw people toward this habitat, and a visitor capacity would be established of 45 people on the grounds around Plum Orchard at any one time (not including visitors in the house).

There is no or limited potential habitat in the vicinity of the proposed pavilions or bathhouse and during design of the proposed trail all efforts would be made to minimize vegetation removal and crossings through any brackish swamp and/or wetland areas. Therefore, the construction and occupation of these facilities is not anticipated to adversely impact the Eastern black rail.

Cumulative Effects

There are only a small number of credible records for black rails in the state of Georgia and none on Cumberland Island. The management actions at the nearby Harris Neck National Wildlife Refuge and in other areas of the state to maintain and support their habitat could beneficially impact the black rail and may contribute to their limited presence in the state.

Effect Determination

Direct impacts to black rail habitat under the proposed actions are not anticipated. However, expanded access and new campsites in proximity to potential habitat could increase the level of disturbance to individual black rails in these areas if they were present. With the implementation of visitor capacities and adaptive management strategies and the mitigation measures listed in appendix G-1, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** Eastern black rail.

Piping Plover (Including Atlantic Coast, Northern Great Plains, and Great Lakes Populations) and their Critical Habitat

Direct and Indirect Effects

Under the preferred alternative, there are several proposed actions that provide additional access options to areas of the island that are currently less frequented by visitors. These actions include the Nightingale Beach trail connectors, realignment and expansion of the South End Trail, expanded ferry service to Plum Orchard, extending bicycle and Class 1, 2, and 3 e-bike use on the beach to

between Stafford Beach and Dungeness Crossings, and the addition of the Toonahowie and Sweetwater Lakes wilderness campsites.

The eastern shoreline of the island (approximately 1,500' inland and 1,100' out to sea), including the southern tip of the island is designated as critical habitat for the piping plover. Despite the full shoreline being critical habitat, the plover typically prefer low wave energy areas, such as those at South End Beach and along the beaches at the northern tip of the island. Higher use of these areas is anticipated to correlate with historically high visitation periods to the island, which in recent years, has peaked from March through July (NPS 2019b). Piping plover are typically present on the island from late July through mid-May so the anticipated heaviest use of these areas would overlap with the presence of piping plover between March and early May, but not in June and early July. The increased potential for the presence of people on the beaches utilized by piping plover would increase disturbance to these species beyond what is currently experienced. The highest visitation numbers at South End Beach have been recorded on weekends in July, when piping plovers are less likely to be present on the island, but there is still potential for a higher density of visitors on this beach than on many others farther north on the island. As a result, the magnitude of increased disturbance would be less at South End Beach than in other locations.

Piping plover behavior associated with the presence of pedestrians can be described as exiting the area by flight; running away from oncoming bicycles and e-bikes, vehicles or pedestrians; and running/flying to high tide wrack line to hide. Persistent increased pedestrian presence may initiate aversive behavior in piping plovers to the level where the birds seek more remote feeding and resting sites. In a review of studies assessing human disturbance impacts on waterbirds, Kathi L. Borgmann (2010) noted that types of disturbances that appeared more likely to cause birds to flush sooner included activities with rapid movement such as running and unleashed dogs. The continued and expanded use of both bicycles and e-bikes on the beach between Stafford Beach and Dungeness Crossings could initiate aversive behavior in piping plovers or cause them to exert energy needed for migration or searching for food in these areas. Bicycles, including e-bikes and traditional bikes, would be subject to the same seasonally reduced speed limits as motor vehicles on the beach between April 1 and July 31 and dusk and dawn restrictions between April 1 and October 30. However, the activity would still be permitted and, depending on the location and frequency of bicycles and e-bikes, could disturb foraging shorebirds. Staff from the Georgia Department of Natural Resources noted that in their experience, plovers are quicker to flush from an identified predator such as a dog than from humans on foot or bicycle/e-bike. Currently, there are no studies measuring the decibels generated from e-bike motors or components; however, given the naturally high ambient noise levels caused by wave action along the beaches on the island, the noise generated by e-bikes is not anticipated to result in impacts to special status bird species. In addition, piping plover are more frequently found in low wave energy locations on the northern or southern tips of the island, areas where bicycles and e-bikes are not allowed on the beach.

Establishment of the Beach Creek campsite could slightly increase the number of small motorized and non-motorized boat use on Beach Creek around the campsite. While the fast-moving and loud disturbances created by motorized boats are generally thought to be more disturbing to shorebirds, non-motorized boat traffic, such as kayaks, can also cause birds to flush (Borgmann 2010). Because of heavier wave action on the eastern side of the island, kayak use is anticipated to be more common on the western intercostal waters, where there is no designated critical habitat for the plovers.

Beach Creek is currently used by motorized boats and its designation as a no-wake zone would result in beneficial impacts to piping plover and other shorebird species in this area.

At South End Beach, these impacts would be mitigated by the establishment of an approximate 1,900-foot-wide visitor access and boat landing and anchoring area that would guide visitor use away

from an established environmental protection zone on the western portion of South End Beach, which is frequently occupied by shorebirds (including piping plover). Closing this protection zone to visitors would protect foraging plovers in this area. In addition, South End Beach would be designated as a dog-free area, which would eliminate the disturbance from off-leash dogs that currently exists. The installation of signage at South End Beach and in other areas of the national seashore would provide information on shorebirds and other sensitive species and inform visitors of dos and don'ts to protect them and their habitat. Together, these efforts would reduce disturbance to piping plover and result in beneficial impacts when compared to current conditions.

In addition, part of the proposed management actions include implementing indicators and thresholds for management strategies. Staff would monitor for people entering posted closures (temporary or permanent) of sensitive shorebird areas and would implement adaptive management strategies to reduce disturbance if more two consecutive monitoring reports of people entering a posted closure or visitor-related disturbance in a posted closure occur during the monitoring period/season. Monitoring of human disturbance on nesting shorebirds could coincide with ongoing shorebird surveys. Although plovers do not nest on the island, their foraging and resting habitat can overlap the posted sensitive areas of other shorebirds. Implementation of adaptive management strategies to maintain these objectives would result in slight beneficial impacts to the piping plover.

Across the island, impacts to piping plover would be minimized by the beneficial effects of the following: additional enforcement, additional educational signage regarding species sensitivity in various locations on the island that would aim to reduce disturbances and benefit shorebirds and other wildlife, including piping plover. In addition, monitoring of shorebirds takes place annually on the island and would continue under the preferred alternative, providing a data set for comparison to staff at the national seashore and further inform adaptive management.

Critical Habitat – Construction of approximately 0.22 miles of the Nightingale Beach access trail and 0.4 mile of the South Point Trail would occur within designated critical habitat for the piping plover, in addition to the two pavilions (each approximately 800 square feet) at Dungeness and Nightingale. While these construction areas fall within the designated critical habitat, they do not include any shoreline, sandflats, algal flats, or other optimal habitat for the plover. Construction could occur simultaneously or separate, depending on funding and schedule. It is anticipated that construction of the pavilions would take less than 3 months to complete and completion of the trails would take up to one construction season. Construction would likely be timed to avoid impacts to other nesting shorebird species and therefore, there could be some temporary disturbance to piping plovers, if present, from the noise and presence of workers in these site-specific locations. However, the noise would be mitigated using best management practices for mechanized equipment and from the sound of nearby wave action and wind of the Atlantic coast. Upon completion, the addition of these two pavilions and a bathhouse at Nightingale could reduce dune trampling by visitors in these areas resulting in a beneficial impact to plover habitat. Additionally, beneficial impacts to plover critical habitat would result from the abandonment of a portion of trail at South End Beach to reduce impacts from human disturbance to nearby foraging and nesting shorebird habitat. Approximately 675 feet of this trail falls within designated critical habitat for the piping plover.

Cumulative Effects

Permanent residents of the island who hold permits can drive on the island's beaches. While this activity is prohibited from 30 minutes before sunset to 30 minutes after sunrise during turtle nesting season between April 1 and October 30, the activity is still permitted during the day and, depending on the location and frequency of vehicles, can disturb foraging piping plover. Previous, ongoing, and future occurrences of this activity have and will continue to contribute noise and disturbance to piping plover resulting in short-term, but repetitive adverse impacts.

Previous and continued fire management, including the use of prescribed burns within the fire-dependent plant communities present on the island, has reduced the potential for catastrophic wildfire and fostered the restoration of longleaf pine and other native fire-adapted vegetation communities. These efforts to restore and maintain preferable habitat for numerous species has resulted in a long-term beneficial effect by reducing fuel loads and maintaining a more open landscape.

Previous and ongoing use of motorized boats around Cumberland Island would continue to have the potential to disturb piping plover because of the noise and fast-moving visual intrusion in locations where boats are moving close to shore and/or landing. Impacts from these disturbances would be similar to those described above and would be greatest in quieter areas with less wave action.

If constructed, the use of the Camden Seaport for rocket launches and landings will be audible from portions of the island where piping plover may be present. Depending on the circumstances and conditions, it is possible a sonic boom, sounding similar to a clap of thunder, may be heard from portions of the island, including areas where piping plover may be present. Although temporary, and with low frequency, these noise disturbances would be expected to contribute noise and disturbance to piping plover resulting in short-term, but adverse impacts.

Effect Determination

The establishment of a landing area, designation of a dog-free area, and increased enforcement and signage at South End Beach and educational signage and increased visitor education throughout the national seashore would encourage visitors to be more aware of their actions and limit disturbances to piping plover from increased access and potential disturbance in areas of the national seashore. Use of best management practices to minimize noise from mechanized equipment during construction of trails, pavilions, and a bath house would minimize site-specific and temporary noise disturbance to piping plover in these areas. With the implementation of these mitigation measures and those listed in appendix G-1, the risk to individual piping plovers would be minimized. Therefore, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** the Atlantic Coast, Northern Great Plains, and Great Lakes populations piping plover and their designated critical habitat.

Red Knot

Direct and Indirect Effects

Impacts to red knot would be similar to those discussed above for piping plover. The construction of the Nightingale Beach trail connectors and South End Trail, expanded ferry service to Plum Orchard, extended bicycle and e-bike use on the beach between Stafford Beach Crossing and Dungeness Crossings, and the addition of the Toonahowie and Sweetwater Lakes wilderness campsites would provide additional access options to areas of the island that have been less frequented.

While red knots are known to feed along the entire stretch of beach on the island, they are known to prefer resting areas below the St. Marys entrance jetty on South End Beach and at the northern tip of the island. Higher use of these areas is anticipated to correlate with historically high visitation periods to the island, which in recent years, has peaked from March through July and again in late fall (NPS 2019b). Red knots are typically present on the island from mid-July through May so the anticipated heaviest visitor use of these areas would overlap with the presence of red knot between March and early May, but not in June and early July. The increased potential for the presence of people on the beaches utilized by piping plover would increase disturbance to these species beyond what is currently experienced. The highest visitation numbers at South End Beach have been

recorded on weekends in July, when red knots are less likely to be present on the island, but there is still potential for a higher density of visitors on this beach than on many others farther north on the island. As a result, the magnitude of increased disturbance would be less at South End Beach than in other locations.

Establishment of the Beach Creek campsite could slightly increase the number of small motorized and non-motorized boat use on Beach Creek around the campsite. While the fast-moving and loud disturbances created by motorized boats are generally thought to be more disturbing to shorebirds, non-motorized boat traffic, such as kayaks, can also cause birds to flush (Borgmann 2010). Because of heavier wave action on the eastern side of the island, kayak use is anticipated to be more common on the western intercostal waters, where red knots are less likely to rest. Beach Creek is currently used by motorized boats and its designation as a no-wake zone would result in beneficial impacts to resting red knots and other shorebird species in this area.

At South End Beach, impacts would be mitigated by the establishment of an approximate 1,900-foot-wide visitor access and boat landing and anchoring area that would guide visitor use away from an established environmental protection zone on the western portion of South End Beach, which is frequently occupied by shorebirds (including red knot). Closing this protection zone to visitors would protect foraging plovers in this area. In addition, South End Beach would be designated as a dog-free area, which would eliminate the disturbance from off-leash dogs that currently exists. The installation of signage at South End Beach and in other areas of the national seashore would provide information on shorebirds and other sensitive species and inform visitors of dos and don'ts to protect them and their habitat. In addition, a portion of trail at South End Beach that runs parallel to the shoreline would be abandoned to reduce impacts from human disturbance to nearby foraging and nesting shorebird habitat. Together, these efforts would reduce disturbance to red knot and result in beneficial impacts when compared to current conditions.

Construction of new trail and two pavilions at Dungeness and Nightingale would fall outside of the red knots preferred tidal river and shoreline areas. Construction could occur simultaneously or separate, depending on funding and schedule. It is anticipated that construction of the pavilions would take less than 3 months to complete and completion of the trail would take up to one construction season. Construction would likely be timed to avoid impacts to other nesting shorebird species and therefore, there could be some temporary disturbance to red knots, if present, from the noise and presence of workers in these site-specific locations. However, the noise would be mitigated using best management practices for mechanized equipment and from the sound of nearby wave action of the Atlantic coast. Upon completion, the addition of these two pavilions and a bath house at Nightingale could reduce dune trampling by visitors in these areas resulting in a beneficial impact to red knot habitat. These temporary disturbances may temporarily disrupt feeding groups of knots, but are not expected to displace the species from the island.

In addition, part of the proposed management actions include implementing indicators and thresholds for management strategies. Staff would monitor for people entering posted closures (temporary or permanent) of sensitive shorebird areas and would implement adaptive management strategies to reduce disturbance if more than two consecutive monitoring reports of people entering a posted closure or visitor-related disturbance in a posted closure occur during the monitoring period/season. Monitoring of human disturbance on nesting shorebirds could coincide with ongoing shorebird surveys. Although red knots do not nest on the island, their foraging and resting habitat can overlap the posted sensitive areas of other shorebirds. Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts to the piping plover. Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts to the red knot.

Cumulative Effects

Cumulative effects to red knot would be similar to those described for piping plovers.

Effect Determination

Similar to the effect determination for piping plover, the establishment of a landing area, designation of a dog-free area, and increased enforcement and signage at South End Beach and educational signage and increased visitor education throughout the national seashore would encourage visitors to be more aware of their actions and limit disturbances to red knot from increased access and potential disturbance in areas of the national seashore. Use of best management practices to minimize noise from mechanized equipment during construction of trails, pavilions, and a bathhouse would minimize site-specific and temporary noise disturbance to red knots in these areas, which have been identified as non-optimal red knot habitat. With the implementation of these mitigation measures and those listed in appendix G-1, the risk to individual red knots would be minimized. Therefore, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** red knot.

Wood Stork

Direct and Indirect Effects

There are no proposed actions within the freshwater marsh, swamps, lagoons, ponds, and brackish wetland habitat of the island that are still used as foraging grounds for the wood stork. The last known nesting area for wood storks was in the Sweetwater Lakes/Lake Whitney area in 2002. Optimal freshwater emergent wetland habitat is more abundant in the northern portion of the island. The new Sweetwater Lakes campsite would not be placed within this habitat, but it would be located along the trail approximately 250 feet from nearby freshwater emergent wetlands. The creation of this campsite, coupled with expanded ferry service to Plum Creek, which is closer to this area of the park, could increase use of the Roller Coaster Trail that traverses closer to this optimal habitat for the wood stork. Wood storks have also been documented at the Plum Orchard Pond, which is located 200 feet north of the mansion and directly adjacent to the Brickhill River and associated marsh. The potential increased presence of people in these areas that could be utilized by foraging wood storks could increase disturbance to these species beyond what is currently experienced, depending on the location of these people and their activities. However, there is a vegetative barrier between the Plum Orchard Mansion Pond and the mansion, there are no trails or amenities that would draw people towards the pond, and a visitor capacity would be established of 45 people on the grounds around Plum Orchard at any one time (not including visitors within the house).

There is no optimal freshwater emergent habitat in the vicinity of the proposed new trail, pavilions, or bathhouse and therefore the construction and occupation of these facilities is not anticipated to adversely impact the wood stork.

Cumulative Effects

Harris Neck National Wildlife Refuge is approximately 50 miles north of Cumberland Island. The refuge has six manmade ponds that are managed for feeding and nesting birds and has constructed more than 100 nesting platforms for nesting wood stork. Water levels in the refuge are managed to attract wading birds, such as the wood stork, during the nesting season. The management actions at Harris Neck National Wildlife Refuge beneficially impact the wood stork and the ample nesting and feeding habitat provided there may contribute to the limited presence of wood stork on Cumberland Island (Dlugolecki 2012).

Effect Determination

There would be no direct impacts to wood stork habitat under the proposed actions. However, expanded access and a new campsite in close proximity to potential foraging habitat could increase the level of disturbance to individual storks within these areas; however, wood storks are known to habituate to levels of activity, and storks are currently exposed to consistent activity in some of their foraging areas. With the implementation of visitor capacities and adaptive management strategies and the mitigation measures listed in appendix G-1, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** wood stork.

Monarch Butterfly

Direct and Indirect Effects

The construction of new trails, utilities, a bathhouse, and pavilions, and the addition of campsites would remove small areas of vegetation and provide additional access options to areas of the island that have been less frequented.

There is the potential for single milkweed plants to be removed as part of vegetation clearing for these proposed actions; however, the locations of the proposed structures in the dune fields and in shaded forest are not ideal conditions for most milkweed species that prefer open conditions with access to sun and sandy soils. The majority of the South End Trail would cross through sandy upland, sparsely vegetated areas, so vegetation removal is expected to be minimal. Following the completion of these elements, disturbed areas would be allowed to recover naturally or revegetated with native plant species.

During construction there could be some temporary disturbance to monarchs, if present, from the noise and presence of workers in these site-specific locations. However, the noise would be mitigated by using best management practices for mechanized equipment and from the sound of nearby wave action of the Atlantic coast. Upon completion, the addition of these two pavilions and a bathhouse at Nightingale could reduce dune trampling by visitors in these areas resulting in a beneficial impact on monarch habitat. These temporary disruptions may temporarily disturb individual monarchs but are not expected to displace the species from the island.

Cumulative Effects

Previous and continued fire management, including the use of prescribed burns in the fire-dependent plant communities present on the island, has reduced the potential for catastrophic wildfire and fostered the restoration of longleaf pine and other native fire-adapted vegetation communities. These efforts to restore and maintain preferable habitat for numerous species has resulted in a long-term beneficial effect by reducing fuel loads and maintaining a more open landscape.

Effect Determination

Use of best management practices to minimize disturbance and vegetation clearing during construction of trails, pavilions, and a bathhouse would minimize site-specific and temporary disturbance to monarchs in these areas. With the implementation of these mitigation measures and revegetation efforts, the risk to individual monarchs would be minimized. Therefore, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** the monarch butterfly.

Gopher Tortoise

Direct and Indirect Effects

Most of the proposed actions would occur south of the currently known range for the tortoise on the island (NPS 2008). The expansion of ferry service to Plum Orchard, allowing the public to camp at Hunt Camp campground, and the addition of two wilderness campsites could result in increased use of existing trails within areas the gopher tortoise is known to inhabit. While tortoise burrows would be unlikely in the proposed wilderness campsite locations, the area would be surveyed to ensure avoidance prior to any vegetation clearing at these two campsites.

Expanding the types of motorized commercial tours offered within the national seashore could increase the number of vehicles on the roads depending on the types and locations of tours; although, per legislation, the number of tours allowed per day would remain at eight. Park personnel have observed tortoises on the Main Road in the past (NPS 2008) and vehicles collisions are known to be a primary threat to the tortoise. Therefore, an increase in the number of vehicles on the Main Road could slightly increase the risk of vehicle strikes to tortoises and other wildlife. However, given the fact that the maximum number of tours per day would remain consistent and vehicle speeds are low, the increase would be negligible.

Cumulative Effects

Previous and continued fire management, including the use of prescribed burns within the fire-dependent plant communities present on the island, has reduced the potential for catastrophic wildfire and fostered the restoration of longleaf pine and other native fire-adapted vegetation communities preferred by the gopher tortoise and several other sensitive species. These efforts to restore and maintain preferable habitat for these species has resulted in a long-term beneficial effect by reducing fuel loads and maintaining a more open landscape preferred by the tortoise.

Effect Determination

There would be no direct impacts to gopher tortoise habitat under the proposed actions. However, expanded access and new camping opportunities could increase visitor use within portions of the island that provide tortoise habitat, which could increase disturbance to individual tortoises. In addition, educational programs developed specifically for special status species would inform visitors of proper behavior when these species are encountered. Expanded types of motorized commercial tours could slightly increase the number of vehicles on the road and the risk for vehicle strikes. However, tour operators would be advised of the potential for tortoises on the road and what to do if one is encountered. As a result, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** gopher tortoise.

Carolina Gopher Frog

Direct and Indirect Effects

The gopher frog requires the relative proximity of terrestrial native xeric upland habitats to temporary or semi-permanent freshwater wetlands. The terrestrial habitat for the frog overlaps the habitat of the gopher tortoise and most of the proposed actions would occur south of the currently known range for the tortoise on the island (NPS 2008). The expansion of ferry service to Plum Orchard, allowing the public to camp at Hunt Camp campground, and the addition of two wilderness campsites could result in increased use of existing trails within areas the gopher frog has potential to inhabit. While tortoise burrows would be unlikely in the proposed wilderness campsite

locations, since gopher frogs are known to inhabit gopher tortoise and other rodent burrows, the area would be surveyed to ensure avoidance prior to any vegetation clearing at these two campsites.

Expanding the types of motorized commercial tours offered within the national seashore could increase the number of vehicles on the roads depending on the types and locations of tours. Although, per legislation, the number of tours allowed per day would remain at eight. There is potential for frogs to be crossing the road during the breeding season as they make their way to freshwater wetlands. Therefore, an increase in the number of vehicles on the Main Road could slightly increase the risk of vehicle strikes to tortoises and other wildlife. However, given the fact that the maximum number of tours per day would remain consistent and vehicle speeds are low, the increased risk would be negligible.

Cumulative Effects

Previous and continued fire management, including the use of prescribed burns within the fire-dependent plant communities present on the island, has reduced the potential for catastrophic wildfire and fostered the restoration of longleaf pine and other native fire-adapted vegetation communities preferred by the gopher frog and several other sensitive species. These efforts to restore and maintain preferable habitat for these species has resulted in a long-term beneficial effect by reducing fuel loads and maintaining a more open landscape preferred by the frog.

Effect Determination

There would be no direct impacts to Carolina gopher frog habitat under the proposed actions. However, expanded access and new camping opportunities could increase visitor use within portions of the island that provide habitat for the frog, which could increase disturbance to individual frogs. Expanded types of road-based commercial tours could slightly increase the number of vehicles on the road and the risk for vehicle strikes. However, tour operators would be advised of the potential for frogs on the road during breeding season and what to do if one is encountered. As a result, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** the gopher frog.

Sea Turtles (Including Green, Kemp's Ridley, Leatherback, Hawksbill, and Loggerhead Sea Turtles) and Loggerhead Sea Turtle Critical Habitat

Direct and Indirect Effects

As discussed above, under the proposed action, there are several proposed actions that provide additional access options to areas of the island that have been less frequented. These actions include the Nightingale Beach trail connectors, construction of the South End Trail, expanded ferry service to Plum Orchard, extending bicycle and e-bike use on the beach to between Stafford Beach Crossing and Dungeness Crossings, and the addition of the Toonahowie and Sweetwater Lakes wilderness campsites. The northern 5 miles of the island consistently records the highest density of nesting activity for loggerhead sea turtles (NPS 2000); however, the southern end and an area north of Stafford Beach are increasing in importance as nesting areas. General expanded ferry service to the island and additional access to various portions of beach along the eastern seashore may lead to increased pedestrian tracks on some sections of beach, and these tracks may have a small effect on the ability of sea turtle hatchlings to reach the ocean (Hosier et al. 1981). In addition, research has shown that travel times of hatchlings from the nest to the water may be extended when traversing areas of heavy foot traffic (Hosier et al. 1981) or bicycle tracks; the same is true of debris on the beach. Hatchlings may be upended and spend both time and energy in righting themselves. Some beach debris may have the potential to trap hatchlings and prevent them from successfully reaching

the ocean. In addition, debris over the tops of nests may impede or prevent hatchling emergence (Hosier et al. 1981; NMFS & USFWS 2008).

Higher use of the island's beaches is anticipated to correlate with historically high visitation periods to the island, which in recent years, has peaked from March through July and again in late fall (NPS 2019b). While loggerhead sea turtles nest on the island in higher numbers, all three sea turtle species have the potential to nest on the island between March and September so the anticipated heaviest use of these areas would overlap with the sea turtle nesting season. The increased presence of people on the beaches utilized by nesting sea turtles would increase the potential for indirect impacts beyond what is currently experienced. Adult nesting females typically crawl out of the ocean to nest during night hours. Additionally, nests normally hatch during night hours, with a portion hatching at dawn, and therefore the increased presence of people during the day would not directly impact hatchling turtles since the majority of visitor use on the beaches occurs during daylight hours. However, as documented in the National Marine Fisheries Service and U.S. Fish and Wildlife Service *Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (Caretta caretta), Second Revision*, overnight visitors who may choose to walk on the beaches at night using flashlights during the nesting season may deter nesting females from coming ashore or disorient hatchlings (NMFS & USFWS 2008). In addition, pedestrian traffic may compact sand over unmarked nests, although the effect of this compaction has not been determined and may be negligible (NMFS & USFWS 2008).

Threats to sea turtles also include vessel strikes. Georgia State Sea Turtle Program Coordinator, Mark Dodd of the Georgia Department of Natural Resources, emphasized that sea turtles are not limited to the ocean side of barrier islands. "They occur everywhere, not just in the ocean," Dodd said. "They're in the sounds, the estuaries, the tidal creeks" (GA DNR 2018). The increased ferry service would overlap sea turtle nesting season and the time when they may be present within the intercostal waters where the ferry travels. The risk of boat collisions would slightly increase for sea turtles within these waters during these months. However, implementation of best management guidelines for ferry operators and posting of educational signage would help to minimize this risk.

At South End Beach, impacts would be mitigated by the establishment of an approximate 1,900 foot wide visitor access and boat landing and anchoring area that would guide visitor use away from an established environmental protection zone on the western portion of South End Beach. In addition, South End Beach would be designated as a dog-free area, which would eliminate potential nest disturbance (digging). The installation of signage at South End Beach and in other areas of the national seashore would provide information on sensitive species, including turtles, and inform visitors of dos and don'ts to protect them and their habitat. In addition, bicycle and e-bike use on the beach would continue to be prohibited between sunset and sunrise between April 1 and October 30 (similar to driving permits) and a reduced speed limit for bicycles and e-bikes would be implemented between April 1 and July 31. Together, these new and ongoing efforts would reduce disturbance to sea turtles and result in beneficial impacts when compared to current conditions.

Critical Habitat – Designated critical habitat for the loggerhead sea turtle exists along the entire eastern shoreline of the island and wrapping around the northern and southern tips. There are no proposed actions within the loggerhead sea turtle critical habitat. The designated boat landing and anchoring zone at South End Beach would be within this zone and could result in temporary sand compaction in areas; however this zone occurs in an area where boats currently land and the zone would reduce the area where this use is allowable, thereby providing a beneficial impact to nests of loggerhead sea turtles.

The potential impacts to sea turles would be mitigated by the park's sea turtle monitoring program, which utilizes interns who patrol the beach from May through October each year. These interns

locate nests; monitor them; and protect them from tidal washovers and predation; and finally inventory them after hatching to evaluate success. The park's sea turtle monitoring program consists of daily patrols from May 1st through October 30th each year, which overlaps periods of high visitation at the park. Records would be kept to evaluate trends in human disturbance potentially related to implementation of the proposed alternative. Mitigation in the form of increased visitor education efforts and nest protection measures would help to reduce pedestrian presence/disturbance around nest sites. Any unanticipated indirect impacts to nesting success would be recorded and adaptive management strategies would be implemented if necessary.

In addition, part of the proposed management actions includes implementing indicators and thresholds for management strategies. Park staff would monitor the number of people per viewshed on several beaches and take adaptive actions to manage the area within established thresholds and capacities (the capacity for Nightingale Beach [between Sea Camp Crossing and Dungeness Crossing] has been identified as 23 people at one time per one-third mile of beach 90% of the time). Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts to the sea turtles Maintaining this low density use along key areas of the island's shorelines, would indirectly minimize the potential for sand compaction and heavy foot traffic. Implementation of adaptive management strategies to maintain these objectives would result in beneficial impacts to sea turtles.

Cumulative Effects

Critical threats to sea turtle nesting and hatching success on the island are raccoon and hog depredation and nest inundation. The turtle monitoring efforts to screen nests, selectively relocate them, implement predator reduction efforts, and educate visitors have proven effective in increasing the success of loggerhead sea turtle hatching on the island resulting in beneficial impacts to sea turtles.

Vehicles driving on the beach are a threat to nesting sea turtles because of the collision potential and resulting tire ruts. Island residents who have a Georgia issued beach driving permit for Cumberland Island are permitted to drive their vehicles on the beach. As mentioned above, having to negotiate vehicle tire ruts increases the amount of time and energy expended by hatchlings attempting to reach the ocean, thereby increasing the chance they will be lost to predators or to desiccation during daylight hours. Adverse impacts sea turtles from potential vehicular collisions are mitigated by restrictions between April 1 and October 30 that prohibit permit holders from driving on the beach between 30 minutes before sunset to 30 minutes after sunrise.

Effect Determination

There would be no direct impacts to sea turtle habitat, including loggerhead sea turtle critical habitat, under the proposed actions. However, expanded access and new camping opportunities could increase visitor use to beaches that provide sea turtle nesting habitat and thereby increase the potential for disturbance to individual turtles and/or increase potential for indirect effects to nesting turtles such as heavy foot traffic and sand compaction. In addition, expanded ferry service could increase the potential for collisions within the Cumberland Sound. However, continued monitoring, implementation of adaptive management strategies in response to established indicators, and increased education, would record changes and minimize any adverse impacts to sea turtles. As a result, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** green, Hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, and loggerhead critical habitat.

Atlantic Sturgeon

Direct and Indirect Effects

Under the proposed action, expansion of the ferry service would result in passenger ferries regularly traveling farther north within Cumberland Sound to Plum Creek. In addition, extending the season for mid-afternoon departures and potentially extending the hours of operation during the summer season would result in passenger ferries being present within a greater extent of the sound later in the season and later in the day. Atlantic sturgeon have been documented within the lower St. Marys River and Cumberland Sound, which is along the route of the ferry service from St. Marys, Georgia.

Threats to Atlantic sturgeon include vessel strikes. The increased ferry service would overlap the confirmed spawning season in Georgia (late summer and fall) and therefore, the risk of boat collisions would slightly increase for spawning sturgeon returning to the St. Marys River during these months. However, migrant individuals that are not spawning in any given year are least likely to be present within Cumberland Sound between June and November and therefore the increased risk during much of the high visitation season would be limited to the portion of the route within the St. Marys River (approximately 5 miles).

Since Atlantic sturgeon are bottom feeders, an increase in kayak/canoe activity in the vicinity of the island would not be anticipated to affect the fish.

Cumulative Effects

During construction of the expansion of the St. Marys Gateway Dock and the Wharf at St. Marys, there could be impacts to Atlantic sturgeon from noise and disturbance to aquatic habitat. In addition, the increased docking capacity could encourage additional boat traffic within the St. Marys River and Cumberland Sound, which would increase the collision potential for sturgeon traveling through this area.

Effect Determination

There is no in-water construction required to accommodate the expanded ferry service and therefore no impacts to Atlantic sturgeon habitat. Given the localized area of overlap for increased ferry service and increased presence of spawning sturgeon, Cumberland Island National Seashore determined this project *may affect, but is not likely to adversely affect* the Atlantic sturgeon.

Shortnose Sturgeon

Direct and Indirect Effects

Impacts to shortnose sturgeon would be similar to those described for Atlantic sturgeon. Expansion of the ferry service would result in passenger ferries regularly traveling farther north within Cumberland Sound towards the Satilla River. In addition, extending the season for mid-afternoon departures and potentially extending the hours of operation during the summer season would result in passenger ferries being present later in the season and later in the day. Shortnose sturgeon have been documented within the St. Marys River, which is along the route of the ferry service from St. Marys, and within the Satilla River, which is west of the northern tip of the island.

Threats to shortnose sturgeon include vessel strikes. The fish spend most of their lives in the estuaries of the rivers they hatch in and as such expanded ferry service from St. Marys would slightly increase the potential for vessel strikes between St. Marys and the Cumberland Sound.

Given their propensity towards river estuarine habitat, an increase in kayak/canoe activity along the coastline of Cumberland Island would not be anticipated to affect the shortnose sturgeon.

Cumulative Effects

Cumulative effects to shortnose sturgeon would be similar to those discussed above for Atlantic sturgeon.

Effect Determination

There is no in-water construction required to accommodate the expanded ferry service and therefore no impacts to shortnose sturgeon habitat. Given the localized area of overlap for increased ferry service and optimal shortnose sturgeon habitat, Cumberland Island National Seashore determined this project ***may affect, but is not likely to adversely affect*** the shortnose sturgeon.

Migratory Birds, Including Shorebirds

To best meet agency obligations to protect migratory birds, the National Park Service will incorporate guidance from the U.S. Fish and Wildlife's Nationwide Standard Conservation Measures to reduce impacts to birds and their habitats during project implementation (USFWS 2019b). This especially applies to shorelines, muddy flats, and beaches, as these habitats are especially important as stopover sites for migratory birds. Under the proposed project, it is unlikely that any actions would affect these species' distribution or population or would affect the presence of any of these species in the action area.

FINDINGS

Based on the currently available biological and ecological data, a review of the published and unpublished literature and studies, communications with experts, and review of NPS analyses addressing proposed actions at Cumberland Island National Seashore, the National Park Service respectfully requests U.S. Fish and Wildlife concurrence on the determination that the proposed action ***may affect, but is not likely to adversely affect***, the federally endangered, threatened, or candidate species listed here; West Indian manatee (*Trichechus manatus*), piping plover (Atlantic Coast, Northern Great Plains, and Great Lakes Watershed populations [*Charadrius melodus*]), red knot (*Calidris canutus rufa*), wood stork (*Mycteria Americana*), gopher tortoise (*Gopherus polyphemus*), Carolina gopher frog (*Lithobates capito*), green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempi*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), shortnose sturgeon (*Acipenser brevirostrum*), as well as sensitive or migratory bird species. Migratory bird protection and conservation will be addressed during project implementation by conducting surveys for nesting birds in the project area to comply with the Migratory Bird Treaty Act.

This biological assessment and findings are based on the best current data and scientific information available. A new analysis and revised biological assessment must be prepared if one or more of the following occurs: 1) new species information (including, but not limited to, a new discovered activity area or other species information) reveals effects to threatened, endangered, proposed species, or designated/proposed critical habitat in a manner or to an extent not considered in this assessment; 2) the action is subsequently modified or it is not fully implemented as described herein which causes an effect that was not considered in this assessment; or 3) a new species is listed or critical habitat is designated that may be affected by the action no analyzed herein.

LITERATURE CITED

Borgmann, Kathi L.
2010 A Review of Human Disturbance Effects on Waterbirds. Audubon California, 376 Greenwood Beach Rd., Tiburon, California 94920.

Dlugolecki, Lisa
2012 "Bird Use of Cumberland Island's Freshwater Wetlands." *Electronic Theses and Dissertations*. 12. Accessed October 2019: https://digitalcommons.georgiasouthern.edu/cgi/viewcontent.cgi?article=1011&context=etd

Ehrhart, L. M., and B. E. Witherington
1992 Green turtle Chelonia mydas (Linnaeus). Pages 90-94 in P. E. Moler, editor. Rare and endangered biota of Florida. Vol. III. Amphibians and reptiles. Univ. Press of Florida.

Florida Fish and Wildlife Conservation Commission (FL FWCC)
2019 Gopher frog, Lithobates capito. Species bio. Accessed December 2019: https://myfwc.com/wildlifehabitats/profiles/amphibians/gopher-frog/.

F. M. Smith, B. D. Watts, J. E. Lyons, T. S. Keyes, and B. Winn.
2017 Investigating Red Knot Migration Ecology along the Georgia Coast: Fall 2015 Season and 2013, 2015-16 Spring Season Summaries. Center for Conservation Biology Technical Report Series: CCBTR-17-04. College of William and Mary/Virginia Commonwealth University, Williamsburg, VA. 93 pp.

Fox, Adam G, Wirgin, Isaac I., Peterson, Douglas L.
2018 "Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia." *Marine and Coastal* Fisheries*: Dynamics, Management, and Ecosystem Science* 10:606–618, 2018. Accessed October 2019: https://afspubs.onlinelibrary.wiley.com/doi/epdf/10.1002/mcf2.10056

Hoffman, Doug

2022 Personal communication (email) with Doug Hoffman, park biologist, and Alexa Miles, natural resource specialist, about the presence of monarch butterflies on Cumberland Island. September 15, 2022.

Hoffman, D.
2009 Cumberland Island National Seashore South End Monitoring Effort Summary. Summary of data gathered by turtle interns on weekends and holidays, weather permitting, between May and October.

Hosier, PE, M. Kochhar, and V. Thayer
1981 Off-Road Vehicle and Pedestrian Track Effects on the Sea-Approach of Hatchling Loggerhead Turtles. Environmental Conservation. Vol. 8, no. 2, pp. 158-161.

Jacksonville University
2019 Gopher Tortoises and Prescribed Fire on Cumberland Island National Seashore. Video. Accessed October 2019: https://www.nps.gov/media/video/view.htm?id=C55B584A-CC87-4E06-BBC8C9CEB6E6FD1F

Georgia Department of Natural Resources (GA DNR)
2018 "Boating Caution: Slow Down for Manatees, Sea Turtles." Wildlife Resources Division. Wednesday, April 18. Accessed online October 2019: https://georgiawildlife.com/boating-caution-slow-down-watch-out-manatees-sea-turtles

2019 Sea Turtle Nest Monitoring System, Sea Turtle Conservation Program. Accessed October 2019: http://seaturtle.org/nestdb/index.shtml?view_beach=90&year=2019

2022 Georgia Department of Natural Resources, Sea Turtles. Accessed September 2022: https://gadnr.org/sea-turtles.

Kenneth N. Smith
1993 Manatee Habitat and Human-related Threats to Seagrass in Florida: A Review. Developed for the Department of Environmental Protection Division of Marine Resources. Accessed October 2019: https://www.nrc.gov/docs/ML1219/ML12198A099.pdf.

Meager, J. J., T. A. Schlacher, and T. Nielsen
2012 Humans alter habitat selection for birds on ocean-exposed sandy beaches. Biodiversity Research. Diversity and Distributions 18:294-306.

Minno, Marc
2011 Investigator's Annual Report. Study Title: Butterflies of Cumberland Island National Seashore. Reporting year 2011.

Morreale, S. J., P. T. Plotkin, D. J. Shaver, and H. J. Kalb
2007 "Adult migration and habitat utilization." In: Biology and Conservation of Ridley Sea Turtles (P. T. Plotkin, editor). The Johns Hopkins University Press, Baltimore, Maryland. Pp. 213–229.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS & USFWS)
2008 Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*), Second Revision. National Marine Fisheries Service, Silver Spring, MD.

National Marine Fisheries Service, US Fish and Wildlife Service, and Secretary of Environment and Natural Resources (NMFS, USFWS, and SEMARNAT , Mexico)
2010 Draft Bi-National Recovery Plan for the Kemp's Ridley Sea Turtles (*Lepidochelys kempii*), Second Revision. National Marine Fisheries Service, Silver Spring, MD.

National Park Service (NPS)
2000 Cumberland Island National Seashore Draft Planning Effort and Environmental Impact Statement. *Chapter 4b: Natural Resource Management Plan*. December.

2008 Biological Assessment for Cumberland Island National Seashore North End Access and Transportation Management Plan. Prepared by Doug M. Hoffman, biologist, Resource Management Division.
2018 Coastal Species of Concern Predation Management Plan and Programmatic Environmental Assessment. Southeast Regional Office.
2019a Cumberland Island National Seashore – Sea Turtles. Accessed October 2019: https://www.nps.gov/cuis/learn/nature/sea-turtles.htm
2019b National Park Service Visitor Use Statistics. "Recreation Visits by Month, Cumberland Island NS." Accessed October 2019: https://irma.nps.gov/Stats/Reports/Park/CUIS.

National Oceanic and Atmospheric Administration (NOAA)
2019a Leatherback Turtle. Accessed October 2019: https://www.fisheries.noaa.gov/species/leatherback-turtle
2019b Loggerhead Turtle. Accessed October 2019: https://www.fisheries.noaa.gov/species/loggerhead-turtle
2019c Atlantic Sturgeon. Accessed October 2019: https://www.fisheries.noaa.gov/species/atlantic-sturgeon
2019d Sturgeon. Accessed October 2019: https://www.fisheries.noaa.gov/species/shortnose-sturgeon

NatureServe
2022 Hawksbill Sea Turtle (*Eretmochelys imbricata*) Profile. Accessed September 2022: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.102642/Eretmochelys_imbricata.

Niles, L., and Cooper Ornithological Society
2008 Status of the Red Knot (*Calidris canutus rufa*) in the Western Hemisphere. Cooper Ornithological Society, Camarillo, California. Internet website: https://sora.unm.edu/sites/default/files/journals/sab/sab_036.pdf.

National Marine Fisheries Service and US Fish and Wildlife Service (NMFS and USFWS)
2015 Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) 5-Year Review: Summary and Evaluation. National Marine Fisheries Service, Silver Spring, Maryland, and US Fish and Wildlife Service, Southwest Region, Albuquerque, NM.

Ozier, J. C., J. L. Bohannon, and J. L. Anderson (project coordinators)
1999 Protected Animals of Georgia. Georgia Department of Natural Resources, Wildlife Resources Division, Nongame Wildlife-Natural Heritage Section. Social Circle, USA, 247pp.

Personal Communication Bill Wikoff, USFWS and John Fry, NPS
2019 Personal communication between Bill Wikoff, U.S. Fish and Wildlife Service and John Fry, National Park Service during an onsite meeting at Cumberland Island on October 2, 2019.

Roznik, Elizabeth A. and Steve A. Johnson
2017 *Gopher Frogs, Burrows, and Fire: Interactions in the Longleaf Pine Ecosystem*. Document WEC 250, one of a series of the Department of Wildlife Ecology and Conservation, UF/IFAS Extension. Original publication date February 2009. Revised September 2017.

Shaver, D. J., and C. W. Caillouet, Jr.
2015 "Reintroduction of Kemp's ridley (*Lepidochelys kempii*) sea turtle to Padre Island National Seashore, Texas, and its connection to head-starting." Herpetol. Conserv. Biol. 10 (Symposium): 378–435.

Soergel, Matt
2015 "Investigating Castaway Gopher Tortoises of Cumberland Island." The Florida Times Union. November 23. Accessed October 2019: https://www.jacksonville.com/article/20151123/NEWS/801257750.

U.S. Fish and Wildlife Service (USFWS)
ND Frequently Asked Questions Service Designation of Terrestrial Critical Habitat for the Northwest Atlantic Population of Loggerhead Sea Turtles. Accessed October 2019 at: https://www.fws.gov/daphne/Index_Page/Loggerhead%20FAQ.pdf
2001 Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Wintering Piping Plovers. Federal Register 66:36038-36143.
2007 Southeast Region. West Indian Manatee (Trichechus manatus) 5-Year Review: Summary and Evaluation. Accessed October 2019: https://www.fws.gov/northflorida/Manatee/2007%205-yr%20Review/2007-Manatee-5-Year-Review-Final-color-signed.pdf
2016 Conserving South Carolina's At-Risk Species: Species facing threats to their survival. Carolina gopher frog. Accessed December 2019: https://www.fws.gov/charleston/pdf/ARS%20fact%20sheets%20for%20web/carolina%20gopher%20frog%20fact%20sheet_SC_2016.pdf
2019a Information for Planning and Consultation, Migratory Birds. Retrieved 1 August 2019.
2019b Midwest Region Endangered Species. Great Lakes Piping Plover, Cause of Declines and Continuing Threats. Accessed October 2019: https://www.fws.gov/midwest/endangered/pipingplover/piplthreats.html
2022a Information for Planning and Consultation (IpaC), resource list. Retrieved 7 September 2022.
2022b Eastern Black Rail Overview Site. Accessed September 2022: https://www.fws.gov/species/eastern-black-rail-laterallus-jamaicensis-jamaicensis.
2022c Monarch Overview Site. Accessed September 2022: https://www.fws.gov/species/monarch-danaus-plexippus.

Watts, B. D.
2016 Status and distribution of the Eastern black rail along the Atlantic and Gulf Coasts of North America. *The Center for Conservation Biology Technical Report Series*, CCBTR-16-09. College of William and Mary/Virginia Commonwealth University, Williamsburg, VA. 148 pp.

Wibbels, T. & Bevan, E.
2019 *Lepidochelys kempii*. The IUCN Red List of Threatened Species 2019: e.T11533A142050590. http://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T11533A142050590.en. Downloaded on 03 December 2019.

Wolfe, Wes
2018 "Manatees, like tourists, also make summer beach appearances." *The Brunswick News*. July 26, 2018. Accessed October 2019: https://thebrunswicknews.com/news/local_news/manatees-like-tourists-also-make-summer-beach-appearances/article_4de32bfc-8541-5a19-86db-817205c2eed1.html

APPENDIX G-1: MITIGATION MEASURES

To minimize potential impact to the natural resources of Cumberland Island from the preferred alternative, actions included in this plan should be implemented with the following conditions:

- Educate ferry operators and boaters about manatees, sea turtles, and sturgeon and boater responsibility.
- Enforce regulations related to the protection of manatees and sea turtles.
- Manage visitor activity adjacent to the Plum Orchard Mansion pond to prevent disturbance of wood storks and other wading birds. Ideally, the number of visitors directly adjacent to the pond should be controlled. If necessary, fencing could be designed to complement and blend with the historic cultural landscape. If fencing is not feasible, then a screen/barrier using natural vegetation should be developed to prevent access to the pond.
- Develop an educational program for concession staff and park interpretive staff that focuses on Threatened and Endangered (T&E) species identification and proper actions when species are encountered. Provide refresher training for staff on a regular basis and ensure that new personnel receive training promptly.
- NPS staff will monitor visitor activities on a regular basis for compliance and potential impacts to species of concern and natural resources in general.
- NPS stall will monitor visitor use of trails north of Stafford Beach Campground. Visitation in these areas is currently minimal and it will be necessary to monitor any potential impacts to the trails and immediate environment from increased use.
- NPS staff will monitor the beach for nesting American oystercatcher pairs, least tern colonies, and other species of concern. Informational signs and rope barriers will be used to identify nesting areas and restrict access when and where necessary to protect the species of concern.
- Staff involved with the annual sea turtle nest monitoring and protection project will continue to maintain records of disturbances to nest sites. A database will be developed to evaluate trends in human disturbance potentially related to implementation of the Preferred Alternative. Mitigation in the form of increased visitor education efforts and nest protection measures will be necessary to maintain a reduced pedestrian presence/disturbance around nest sites.
- Seasonal trail or beach closures may be implemented during certain times of the year. The Park's resource managers will make this determination based on the presence of species of concern, their proximity to key visitor access routes or locations, and the likelihood that increased levels of human disturbance may negatively affect breeding or nesting success.
- Any potential future night programming would take precautions to minimize the use of lighting and noise disturbances.
- Bicycle and e-bike use on the beach will be prohibited between 30 minutes before sunset to 30 minutes after sunrise during sea turtle nesting season between April 1 and October 30.
- While on the beach, the speed limit for bicycles and e-bikes will be reduced to 20 miles per hour from April 1 through July 31.
- According to NPS *Management Policies* 2006, the National Park Service would strive to construct the proposed trails with a sustainable design to minimize potential environmental impacts. Development would not compete with, dominate park features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity. To the extent possible, the design and management of the proposed trails and boardwalks would emphasize environmentally sensitive construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings.

- Care would be taken to not disturb any sensitive wildlife species found nesting, hibernating, estivating, or otherwise living in or immediately nearby worksites. Resource management personnel would be notified/consulted when wildlife must be disturbed or handled.
- If sensitive resources are discovered during trail or campsite construction, construction would cease and the area would be surveyed in more detail so that impacts could be avoided or minimized and/or an alternative route established.
- Educate vehicle tour operators of the potential for tortoises on the road and what to do if one is encountered.

APPENDIX H: FLOODPLAINS STATEMENT OF FINDING

FLOODPLAINS STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11988: FLOODPLAIN MANAGEMENT
DIRECTOR'S ORDER 77-2: FLOODPLAIN MANAGEMENT

Recommended:

_____

Gary Ingram — Date

Superintendent, Cumberland Island
National Seashore

Certification of Technical Adequacy and Servicewide Consistency:

_____

Forrest (Ed) Harvey — Date

Chief, Water Resources Division, National Park Service

Approved:

_____

Mark Foust — Date

Regional Director, Region 2, National Park Service

INTRODUCTION

The National Park Service (NPS) has prepared this Floodplain Statement of Findings (FSOF) in compliance with Executive Order 11988 *Floodplain Management* and Directors Order 77-2. The National Park Service would undertake a federal action for the construction of two pavilions, two backcountry campsites (Toonahowie and Beach Creek), and approximately 1.2 miles of trail as part of the implementation of a visitor use management plan at within the legislated boundary of Cumberland Island National Seashore (CUIS or "Seashore").

The park is developing a visitor use management (VUM) plan (the plan) to provide appropriate opportunities for visitors to use, experience, and enjoy Cumberland Island National Seashore while ensuring the protection of natural, cultural, and scenic resources and values. Through the planning effort, visitor capacity will be identified based on the maximum amount and type of visitor use that an area can accommodate while achieving and maintaining the desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established. The proposed actions mentioned above are elements of the VUM plan that would occur within the 100-year floodplain.

The VUM plan is needed to establish a vision to manage visitor use at the park. It will evaluate access to and around the island, as appropriate, that allow for optimal resource protection and visitor experience. It will determine what facilities and services—including commercial services—may be necessary and appropriate to support visitor use while considering desired conditions and complying with the wilderness and seashore's enabling legislation. Finally, the visitor capacity will be identified based on the maximum amount and type of visitor use that an area can accommodate while maintaining the desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established.

The outcome of the VUM plan includes prioritization of appropriate uses at various locations throughout the park. The plan will set priorities for resource protection where visitor use occurs and will use a range of strategies to enhance the visitor experience. Finally, management options will be assessed for their feasibility and sustainability, taking into consideration the condition of park facilities, maintenance needs, and projected funding and staffing levels.

Implementation of the plan would include the construction of two pavilions, two additional primitive (wilderness and backcountry) campsites (Toonahowie and Beach Creek), and approximately 1.2-miles of trail within the 100-year floodplain. These elements would enhance visitor opportunities by providing access, shade and picnic accommodations, and the opportunity to camp in areas of the national seashore that were not previously possible and/or limited to day use.

The proposed project represents a key opportunity to meet the Secretarial Order 3356, signed September 15, 2017, which directs bureaus within the DOI, to expand and improve access for hunting, fishing and outdoor recreation on Bureau of Land Management (BLM), United States Fish and Wildlife Service (USFWS) and National Park Service (NPS) land. This secretarial order also directs these agencies to improve wildlife habitat.

BRIEF SITE DESCRIPTION

Cumberland Island National Seashore is the largest and southernmost of Georgia's barrier islands. Located 1–3 miles off the mainland coast, the island is bounded by the Cumberland River on the west, by St. Andrew's Sound on the north, the Atlantic Ocean on the east, and by Cumberland Sound on the south. The island is 17.5 miles long, ranging from approximately a 0.5 mile to 3 miles wide, and totals 36,415 acres of which 16,850 are marsh, mud flats, and tidal creeks. The northern portion includes 9,907 acres of designated wilderness, while an additional

10,710 acres are classified as potential wilderness. Most of the island's uplands are federally owned and managed by the National Park Service. The remaining portions of the island are state owned, privately owned, or owned by other federal entities, including the Department of Defense.

A small number of people have private homes on the western and northern regions of the island, though very few live on the island year-round. Roughly 1,000 acres of Cumberland Island are privately held without restrictions.

The national seashore has the greatest diversity of habitats and biotic communities of any of Georgia's coastal islands. Extensive Spartina marshes and tidal creeks cover the western shoreline, providing highly productive estuarine nursery and feeding grounds for juvenile fish, shrimp, crabs, and other invertebrates. Upland forest communities comprise a large portion of the island. Oak and pine dominate most mature forests and saw palmetto is a common understory plant. Additionally, the island has a sizeable acreage of scrub/shrub habitat supporting a variety of unique plant species. Surface aquatic systems are extensive and include freshwater lakes, ponds, and sloughs with highly fluctuating water levels. Dune communities extend the length of the eastern shoreline and are primarily composed of sparse stands of grasses, forbs, and sedges. Human-dominated habitats consisting of isolated residences and historic landscapes make up a small percent of the island's area.

The aquatic and terrestrial fauna of the island are diverse. More than 300 bird species use the seashore at various times of the year, and more than 100 species are known to nest there. The island provides habitat for a variety of mammals including the white-tailed deer, raccoon, river otter, and bobcat. More than 50 species of herpetofauna are present. American alligators are abundant, and the nesting population of the federally threatened loggerhead sea turtle is the most significant along the Georgia coast. Feral populations of hogs and horses roam freely on the island, and while Cumberland Island National Seashore has established the objective of eradicating the hog population, feral horses currently are not managed.

The areas of the island where actions are being proposed within the 100-year floodplain include the eastern shoreline near Nightingale and Dungeness Beaches, the Table Point area on the northwestern coast of the island, and the southern low-lying portion of the island.

BRIEF DESCRIPTION OF THE PROPOSED ACTION

The full description of the proposed action can be found in chapter 3 of the Cumberland Island National Seashore Visitor Use Management Plan and Environmental Assessment. Only those actions proposed to occur within the 100-year floodplain are analyzed here.

To comply with Executive Orders 11988 and 11990, each element would be designed to reduce property losses and risk to human safety. The proposed action would not alter flood flows and impacts on floodplain functions and values would be inconsequential because of the use of floodplain mitigation techniques and compliance with applicable standards, regulations, and policies.

Estimated areas of impact are presented below and would not exceed 400 square feet collectively or require mitigation. The estimates are approximate because the trail alignment is not yet in the design stage of development and could change; however, impacts would not exceed these numbers and are anticipated to be considerably less. If necessary, additional compliance would be completed at that time.

Proposed actions that would occur within the defined 100-year floodplain include the following:

Toonahowie Wilderness Campsite: An additional wilderness campsite would be designated at Toonahowie (see figure 1 and alternative figure in the environmental assessment) along the northwest coast of the park. The site previously contained a privately-owned has that has since been removed. The campsite would be accessible on land by foot or along the coast by small watercraft. The campsite would consist of a small, already existing cleared space and a well. A well is already in place at this site and it would simply be modified for use by campers. No other infrastructure or development would occur.

Beach Creek Backcountry Campsite: An additional backcountry campsite would be designated along Beach Creek in the southwest portion of the island. The primitive campsite would consist of a small cleared space and a well but would not include any other infrastructure or development.

Nightingale Beach Access Trail: A new trail would be constructed to provide direct beach access from the newly constructed Nightingale-Parallel Trail. Approximately 910 linear feet of the dune field crossing portion of this trail would fall within the 100-year floodplain.

Nightingale and Dungeness Pavilions: Two pavilions would be constructed within the 100-year floodplain, one at Nightingale and one at Dungeness. Each approximately 800 square foot pavilion would be placed to avoid the need to remove larger mature vegetation. In addition, the pavilions would be sited in appropriate locations to avoid the need for extensive grading efforts and an anticipated floorless design would allow dune sands to migrate without damaging the structure and without altering elevation.

South End Trail: The majority of the trail would cross through sandy sparsely vegetated areas, going in and out of the mapped 100-year floodplain. The trail route would follow existing game trails and would require minimal removal of understory vegetation. It is estimated that approximately 3,900 linear feet of trail will fall within the mapped 100-year floodplain. The estimates are approximate because the trail alignment is not yet in the design stage of development and could change; however, the length of trail within the floodplain is not expected to exceed these numbers.

South End Spur Trail to Beach Creek Campsite: The entire South End Spur Trail, approximately 1.685 feet in length, would fall within the mapped 100-year floodplain.

GENERAL CHARACTERIZATION OF FLOODPLAIN VALUES AND OF THE NATURE OF FLOODING AND ASSOCIATED FLOODPLAIN PROCESSES IN THE AREA

The project area is within the 100-year floodplain, as shown on Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) Map Numbers: 13039C0315G, 13039C0320G, 13039C0325G, 13039C0430G, 13039C0435G, 13039C0440G, and 13039C0505G for Camden County, GA (as depicted on Figure 1). The Federal Emergency Management Agency defines geographic areas as flood zones according to varying levels of flood risk. The zone reflects the severity or type of flooding in the area, as depicted on Figure 1. The zone, labeled "AE" on the Federal Emergency Management Agency map, is within the 100-year floodplain and ranges in elevation from 8-11 ft. National Geodetic Vertical Datum of 1988 (NAV88). The major source of flooding the various project locations would be flooding from storm surge or over wash from the direction of the Atlantic Ocean and/or the inter-coastal waterway.

Floodplains with the national seashore perform important natural functions, including temporary storage of floodwaters, dissipation of storm water runoff, moderation of peak flows, groundwater recharge, prevention of erosion, and maintenance of water quality. In general, natural buffers, such as the sandy beach, dunes, and vegetation in the vicinity of the project areas help maintain the natural functions of the floodplain. In the Beach Creek campsite and Toonahowie campsite portions of the project area, wetland vegetation along the shoreline acts as natural barriers to dissipate wave energy and protect the southern and western shorelines of the island from flooding and erosion.

The park supports a number of natural features that reduce flooding severity. For example, dunes along the eastern seashore impede storm surge, and ponds and other depressions also function to store water during over wash or large precipitation events. Flooding on the seashore can range from minor over wash events during high tides to major flooding from hurricanes and other coastal storms. Excessive precipitation can also flood low elevation areas across the park. Many of the highest points on the islands are within the relict dune fields. Soils are sandy and the vegetation cover is often incomplete. The amount of natural vegetation cover present and the amount of impervious surface within a floodplain influences the degree of retention or effective function a floodplain can provide. The more vegetation and less impervious surface that is present within the floodplain, the better the floodplain can serve to protect the surrounding area from soil erosion and flooding. The ecological value of a heavily vegetated floodplain also increases because it provides increased suitable habitat for wildlife. The dynamic Cumberland Island floodplain provides habitat for migrant water birds and helps reduce sound-side wind and wave impacts from storm effects.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

The entire shoreline and southern portion of the island are within the 100-year floodplain, therefore, any development to support visitor use on the eastern shoreline or recreation in the southern portion of the island would have a floodplain location. The areas for the proposed shade pavilions are proposed within the dune line of two beach access points, which is the only practicable locations for a shade relief area for beach visitors. One of the primary visitor activities to the national seashore is beach access and these proposed pavilions would provide protection for visitors rather than relocation. The proposed backcountry campsite would improve visitor access to the southern portion of the island, which is entirely within the 100-year floodplain. The proposed wilderness campsite would provide additional access to the wilderness portion of the park. In addition, both campsites would collectively provide the only opportunity for small watercraft accessible campsites on the island. Further, the proposed action proposes very little infrastructure in an area that is anticipated to be affected by sea level rise and climate change. The proposed actions will allow for improved access and use of the area without significantly affecting natural surface water flows or natural floodplain functions of the project area. The purpose of the visitor use plan is to provide appropriate opportunities over the lifespan of the plan for

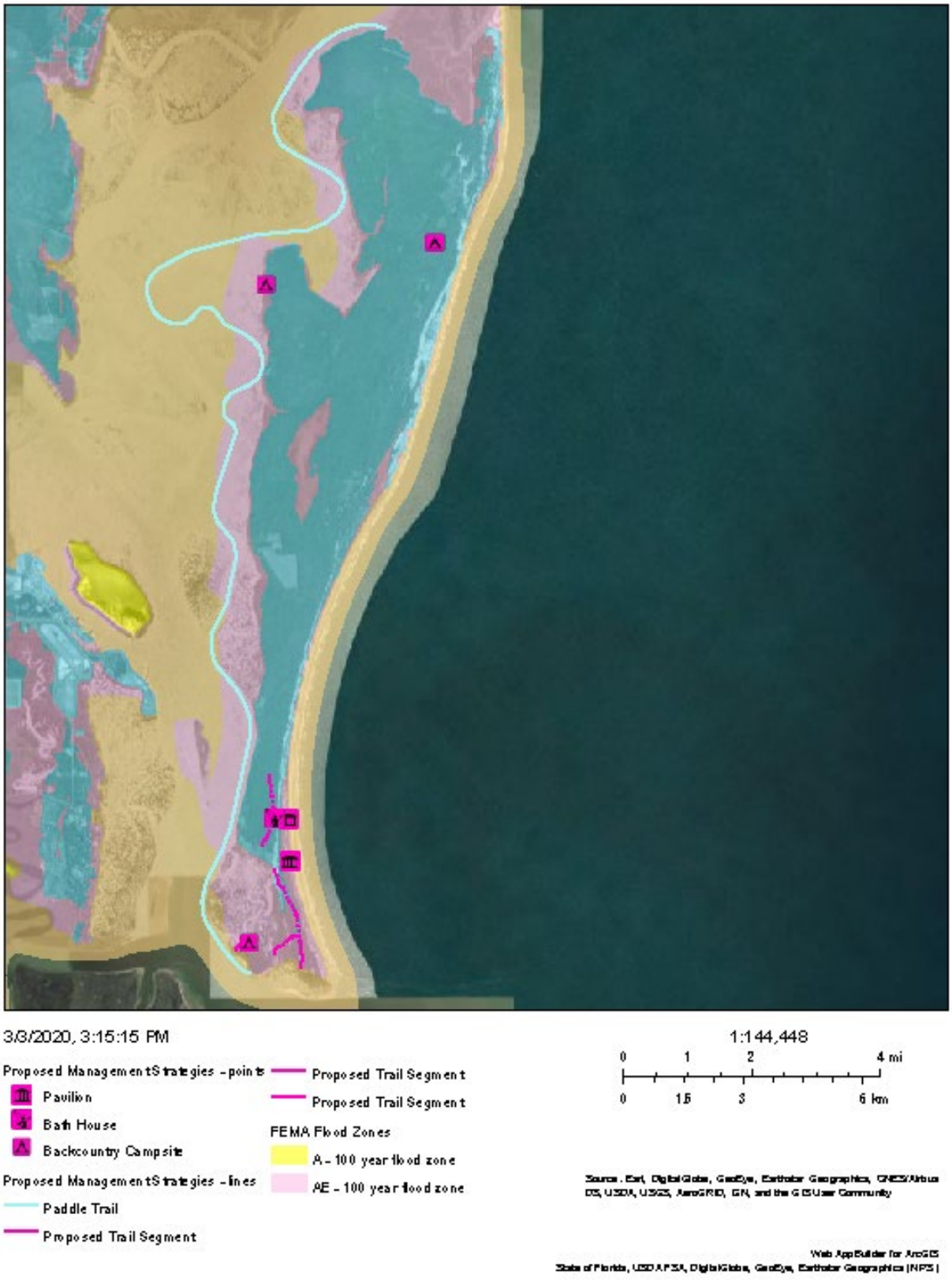


Figure H-1: Proposed Actions and Designated Flood Zones at Cumberland Island

visitors to use, experience, and enjoy Cumberland Island National Seashore while ensuring the protection of natural, cultural, and scenic resources and values.

MEASURES TO MITIGATE FLOOD HAZARD TO HUMAN LIFE, PROPERTY, NATURAL/BENEFICIAL FLOODPLAIN VALUES

Conditions associated with normal flooding at this location are not considered particularly hazardous to people or property. More extreme flooding generally occurs in the project area as a result of hurricanes and storm surge-making weather/marine warnings, which makes evacuation a practical option for protection of human life. A Hurricane Plan is in place for the park and is updated annually and the park has a standard operating procedure for evacuating campgrounds in the event of an emergency. In the event of an approaching hurricane and/or storm surge event, the Hurricane Plan and evacuation procedures would be implemented accordingly and both the Beach Creek and Toonahowie campsites would be evacuated and closed to visitors until conditions were safe.

The plan goes into effect at the beginning of the annual hurricane season and remains in effect until the end of the season (June 1 through November 30). The plan provides the following:

- a safe, practical guideline for management of hurricane preparations;
- assured accountability for preparation and general hurricane season actions;
- a means for the superintendent to determine an acceptable level of risk to government facilities and property for any given hurricane situation;
- a method used to trigger the plan that is consistent with other objectives;
- a schedule of progressive preparation actions that under ideal conditions allows for the release of most employees between 24 and 48 hours prior to expected landfall of a hurricane and guarantees the release of all employees 24 hours prior to the expected landfall of a hurricane;
- a guideline for actions to be taken immediately after a storm; and
- assured consistency and coordination of planning and preparation with the local Camden County Emergency Management Agency.

For the proposed trail construction within the floodplain, the mitigation provided in the project scope includes elevating portions of the South Beach, Nightingale Beach, and Beach Creek access trails that cross wetlands to minimize impacts and maintain natural and beneficial floodplain values. All portions of the boardwalk along the South Beach, Nightingale Beach, and Beach Creek access trails would occur within the 100-year floodplain due to the proximity to the Atlantic Ocean and Inter-coastal Waterway.

There is no infrastructure associated with the proposed Toonahowie wilderness campsite and the Beach Creek backcountry campsite, other than a well (already existing at Toonahowie). The proposed pavilions at Nightingale and Dungeness Beaches would be simple, floorless (no concrete pad) shade structures utilizing natural materials wherever possible. The minimal infrastructure associated with these actions is sacrificial with an expected life of 30 years, and intended only to support the mission of the National Seashore and with minimal environmental

consequences if they were washed out in a storm surge. As such, loss of the capital investment (property) resulting from a severe flood event would be considered an acceptable loss.

None of the proposed actions would alter the current elevations of the area and are not anticipated to reduce flood storage capacity; thus, no specific mitigation would be required.

SUMMARY

The National Park Service finds that the proposed actions under the Visitor Use Management Plan, including trail, campsite, and pavilion efforts to construct new trails, campsites, and pavilions are essential for public use, despite the fact that the actions would be located in flood-prone areas. The National Park Service also finds that in constructing these facilities, there are no practicable alternatives to locate the project outside of the floodplain since the areas these amenities are serving are entirely within the 100-year floodplain. Conditions associated with normal flooding at this location are not considered particularly hazardous to people or property and weather/marine warnings in conjunction with a Hurricane Plan and associated closure/evacuation procedures are currently in place for protection of human life for more extreme flooding events. The design of the proposed action would allow natural surface water flows and natural and beneficial floodplain values to continue. To mitigate risks to property, the design elements are minimal and utilize sacrificial infrastructure, meaning they would wash out with minimal environmental consequences if a storm surge hit. This project is consistent with the policies and procedures of NPS Director 's Order #77-2 (Floodplain Management) and Executive Order 11988, and Director’s Order #77-1 (Wetland Protection) and Executive Order 11990.

REFERENCES

Emergency Management Institute (EMI)

2008 Floodplain Management: Principles and Current Practices. Floodplain Natural Resources and Functions (Chapter 8). Available on the Internet at: https://training.fema.gov/hiedu/docs/fmc/chapter%208%20-%20floodplain%20natural%20resources%20and%20functions.pdf

Federal Environmental Management Agency (FEMA)

1992 Floodplain Management in the United States: An Assessment Report. Volume 1 Summary Report. Interagency Floodplain Management Taskforce.

National Park Service (NPS)

2003 Procedural Manual 77-2 Floodplain Management

2016 Procedural Manual 77-1 Wetlands Protection

This page intentionally left blank.

APPENDIX I: COASTAL ZONE FEDERAL CONSISTENCY DETERMINATION

United States National Park Service – Cumberland Island National Seashore

Visitor Use Management Plan

Camden County, Georgia

The Coastal Zone Management Act of 1972 requires that a Federal agency provide the State of Georgia with a Consistency Determination when a Federal agency proposes any activity inside or outside of the coastal zone that will have any reasonably foreseeable effect on any coastal resource or uses within the coastal zone.

The National Park Service (NPS) proposes several development actions (establish trails, clear two new campsites, and construct two pavilions and a comfort station) as part of the implementation of a visitor use management plan. The proposed project would have reasonable foreseeable effects on coastal resources and uses within the national seashore.

The NPS seeks concurrence with the determination that the proposed project (as described below) is consistent to the maximum extent practicable with the enforceable policies of Georgia's approved coastal management program.

PROJECT DESCRIPTION

The proposed alternative aims to balance visitor use opportunities and resource protection in the areas of Cumberland Island under NPS jurisdiction. Actions proposed under this alternative include enhanced visitor recreational opportunities related to camping in designated wilderness as well as the park's backcountry and frontcountry areas; hiking along an extended trail network; visiting the Plum Orchard district; and utilizing on-island commercial services. This alternative incorporates visitor use management strategies including implementing visitor capacities at key locations. Mitigation measures and best management practices that would be implemented under the action alternative are included in appendix A.

INDICATORS AND THRESHOLDS

The National Park Service would conduct monitoring as part of the implementation of the chosen alternative to ensure that desired conditions for resources and visitor experiences are achieved and maintained. Monitoring is the process of routinely and systematically gathering information or making observations to assess the status of specific resource conditions and visitor experiences, and is a critical step in successfully implementing this VUM plan. This plan establishes a monitoring strategy that is designed to generate usable data for periodically comparing existing and desired conditions, assessing the need for management actions, and evaluating the efficacy of management actions. This iterative practice of monitoring, implementing potential management strategies, and then continuing to monitor to gauge the effectiveness of those actions allows park managers to maximize benefits for visitors while achieving and maintaining desired conditions for resources and visitor experiences in a dynamic setting.

The monitoring strategy for this plan was developed using the guidance developed by the Interagency Visitor Use Management Council (IVUMC, or the council), and is considered part of the action alternative. The monitoring strategy includes indicators, thresholds, and objectives. Indicators translate desired conditions of the VUM plan into measurable attributes (e.g., linear

extent of visitor-created trails) that when tracked over time, evaluate change in resource or experiential conditions. Thresholds represent the minimum acceptable condition for each indicator and were established by considering qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, professional judgement of staff from management experience, and scoping on public preferences. Objectives were established in situations in which managers want to define measurable outcomes for what should be achieved within specified timeframes.

The following indicators were identified to be most important in maintaining desired conditions for visitor experience and natural and cultural resources. Thresholds, objectives, rationales, monitoring guidelines, and associated management strategies will be included in the environmental assessment.

- **Indicator:** Number of people entering posted closures (temporary or permanent) of sensitive shorebird areas.
- **Indicator:** Number of visitor created trails leaving Seacamp and Stafford Beach campgrounds.
- **Indicator:** Area of exposed soil.
- **Indicator:** Number of people per viewshed at key locations.
- **Indicator:** Number of people encountered on trails per day in designated wilderness.

The management strategies related to the indicators would be implemented incrementally as thresholds are approached or exceeded, or to achieve an objective.

VISITOR CAPACITY

The primary goal of this VUM plan is to preserve the fundamental resources and values of Cumberland Island. The amount, timing, distribution, and types of visitor use on Cumberland Island influences both conditions of fundamental resources and visitor experiences. By managing the maximum amounts and types of visitor use at key destinations on the island, the National Park Service can ensure that resources are protected and that visitors have the opportunity for a range of high-quality experiences.

The visitor capacities for this plan were developed using the guidance developed by the IVUMC, and are considered part of the action alternative. The IVUMC defines visitor capacity as the maximum amounts and types of visitor use that an area can accommodate while achieving and maintaining the desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established. By identifying visitor capacities and managing the amounts and types of use within those capacities, the National Park Service can ensure that resources are protected and that visitors have opportunities for high-quality experiences. Identification of visitor capacities, and strategies to manage to these capacities, is also directed by the National Parks and Recreation Act of 1978. Implementation of these visitor capacities are considered part of the action alternative.

To identify the appropriate amounts and types of use at key areas, a variety of data was reviewed to understand current conditions compared to desired conditions for the area. The visitor capacity identification also takes into consideration management objectives and strategies being implemented for an area. If the visitor capacity analysis identified any additional actions needed to manage within visitor capacities, these actions were added to the action alternative.

TABLE H-1. VISITOR CAPACITY AT KEY LOCATIONS

Analysis Area (Key Location)	Visitor Capacity
Nightingale Beach	20 PAOT/one-third mile
Stafford-Greyfield Beach	8 PAOT/one-third mile
Jetty Beach	8 PAOT/one-third mile
North Beach	4 PAOT/one-third mile
South End Beach	30 PAOT/one-third mile (the visitor capacity for the closed area to the west of the beach access area is 0 people at one time)
Dungeness and Sea Camp	92 PAOT at Dungeness Ruins
Plum Orchard	90 PAOT (45 PAOT in the mansion, 45 PAOT on the grounds)
Settlement/First African Baptist Church	33 people at one time (PAOT) (9 PAOT inside the church, 12 in the vicinity of the church, and 12 PAOT in other areas), 100 PPD
Wilderness	210 PAOT (72 PAOT at campsites, 138 at one time on trails)

FERRY DELIVERY

In addition to the identification of visitor capacities for key destinations on the island and the establishment of a monitoring framework that includes indicators, thresholds, and objectives, the planning team considered management of the daily ferry service to Cumberland Island.

The analysis report recommends that an increased daily ferry delivery should not exceed 500 people per day given the current understanding of the relationship between daily ferry delivery and visitor use patterns. Increased daily ferry delivery would be implemented in an incremental fashion. As increasing numbers of visitors were delivered to the island by ferry, continued monitoring of indicators and visitor capacities would track the relationship between the daily ferry delivery number and actual conditions at key destinations

Management of daily ferry delivery to the island is crucial to maintaining and protecting the desired experience and resource conditions of the park. It is also an important aspect to managing the amounts and types of use within the identified visitor capacities for key areas and ensuring thresholds are not exceeded. Management of daily ferry delivery to the island is considered part of the action alternative(s).

TABLE H-2. PROPOSED ACTIONS OF THE PROPOSED ALTERNATIVE

Management Topic	Description of Action Alternative
Designated Wilderness Camping	The park would offer camping opportunities at four designated wilderness campsites and maintain the number of visitors that could camp in the designated wilderness at one time. Brickhill Bluff and Hickory Hill would remain active. Additional wilderness campsites would be designated at Toonahowie and Sweetwater Lakes. Campsites at Hickory Hill and Sweetwater Lakes would be accessed by foot while the Brickhill Bluff and Toonahowie sites could be accessed via land or non-motorized and/or small motorized watercraft. The existing site at Yankee Paradise would be abandoned and generally replaced by public camping opportunities at Hunt Camp campground, which is adjacent to but outside of the wilderness area. Similar to the no-action alternative, wilderness campsites would consist of small, cleared spaces and wells, but no other infrastructure or development. The existing well at Toonahowie would be modified for camper use; at the Sweetwater Lakes campsite campers may obtain water from the lake. The campsites in designated wilderness would continue to be administered through a permit system managed by Recreation.gov. Fees would be implemented for public campsite reservations. Permits for each of the 4 wilderness sites would be available for up to 3 parties of 6 people or less at one time. A maximum of 72 visitors would be able to camp in the designated wilderness at one time (4 sites x 3 parties x 6 people = 72 campers).
Backcountry Camping	The park would offer backcountry camping opportunities at current levels at Stafford Beach Campground and new opportunities at Beach Creek campsite and Hunt Camp campground. The designated backcountry sites would continue to be administered through a permit system managed by Recreation.gov; fees would be implemented for public campsite reservations. Stafford Beach Campground would continue to accept reservations for 6 of the 10 existing sites at any one time to allow individual sites to recover from visitor use. Up to 36 people would be allowed to camp at Stafford Beach Campground at one time (6 available sites x 6 people = 36 campers). Similar to wilderness campsites, the backcountry campsite at Beach Creek would consist of small, cleared spaces and a well, but no other infrastructure or development. The sites would be accessible by non-motorized and/or small motorized watercraft or by trail (see South End Trail description below for additional details). Three parties of up to 6 people each would be permitted to camp at Beach Creek at one time. When Hunt Camp campground, which is located adjacent but not in the Cumberland Island Wilderness Area, is not being utilized for the public hunts it will be available to the public through individual site reservations. No new infrastructure will be needed at Hunt Camp. Reservations would be available for 3 parties of up to 6 people on any given night for a total of 18 campers. Under the proposed alternative, a maximum of 72 campers could camp in the backcountry on any given night (36 Stafford Beach campers + 18 Beach Creek campers + 18 Hunt Camp campers).
Sea Camp Campground (Front Country Camping) and Sea Camp Dock	The park would expand camping opportunities at Sea Camp Campground by adding the 3 existing overflow sites to the current reservation system. Fifteen of the 19 individual sites would be available for visitors to reserve at any one time and 4 sites would be rotated into administrative closures to allow recovery or prevent impacts from heavy use. Parties of up to 6 campers would be able to reserve sites through Recreation.gov and fees would continue to be implemented for public campsite reservations. The two group sites that can accommodate up to 20 campers would remain open for reservations as well.

Management Topic	Description of Action Alternative
	Under the action alternative, up to 130 people may camp in the frontcountry campground at one time, with 40 campers allowed in the group sites and 90 campers allowed in the individual sites ([15 available sites x 6 people] + [2 group sites x 20 visitors] = 130 campers). Kayak and/or canoe rentals could be available at Sea Camp Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources.
South End Beach and Waters	The park would designate an approximately 1,900-foot wide visitor access and boat landing and anchoring area along South End Beach that could shift from year to year depending on coastline conditions. No anchoring or beaching of boats would be permitted outside of the designated area. Establishment of this area would designate an area accessible to visitors and guide visitor use away from sensitive natural resources. Landing and anchoring zones and accessible/non-accessible areas would be delineated by buoys, markers, signage, and/or flagging. Signage that provides information regarding sensitive species, directs visitors to pay park entrance fees, and notifies commercial service providers of the requirement to have a commercial use authorization would be installed. Dogs would **NOT** be permitted on South End Beach (on leash or off). Pedestrian access to South End Beach would continue via Dungeness Beach Crossing. Beach Creek would be designated as a no-wake zone as would the small, unnamed tidal creeks that occupy the marsh area just north of the South End Beach.
South End Trail	The park would construct and realign South End Trail to provide a loop trail opportunity by connecting the Dungeness Marsh Boardwalk to portions of the existing trail. That new segment would serve as one leg of the loop and the beach would serve as the other leg. A new spur trail would be constructed to connect the existing South End Trail with the proposed Beach Creek backcountry campsite. A portion of the existing South End Trail that runs through the south end marsh would be abandoned and the segment realigned onto upland terrain.
Plum Orchard	The park would continue to offer daily NPS-guided tours of the Plum Orchard Mansion. Visitors would continue to be able to access Plum Orchard grounds via bicycling along park roads, hiking, personal boat, or as part of the Lands and Legacies commercial tour. Additional ferry service to Plum Orchard dock would be considered as a new, separate ferry route or as an additional stop on the existing route/schedule. Visitors debarking from the Plum Orchard ferry stop would have direct access to the Plum Orchard grounds and could opt to take one of the NPS-guided tours of the mansion or decide to use the ferry stop as an arrival /departure point for wilderness and backcountry hiking or camping experiences. A new shorter motorized concessions tour from Sea Camp to Plum Orchard would allow day-use visitors more flexibility to also visit other key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. Kayak and/or canoe rentals could be available at Plum Orchard Dock if that location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the dock would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.

Management Topic	Description of Action Alternative
Nightingale Beach and Trail	The park would create a new trail to provide direct beach access from the Nightingale Trail. A bathhouse consisting of restrooms and outdoor showers (~400 square feet) would be constructed at the junction of the existing Nightingale Trail and the two new segments. Approximately 2,670 feet of water utility line would be installed from an existing well house, across the Main Road, and along the Nightingale Trail. Electricity would either be provided by solar panels or by extending an existing utility line approximately 1,850 feet along the Nightingale Trail from the Main Road. These utility lines would be installed utilizing a trenching machine along existing roads and trails. An approximately 1,200 square foot septic leach field would be installed in appropriate proximity to the bathhouse. The exact location of these facilities would be determined during design. Additional compliance requirements would occur before implementation. A pavilion (~800 square feet) would also be constructed alongside the Nightingale Beach access spur, providing shelter to visitors within the dune field. Additional compliance requirements would occur before implementation.
Dungeness	A pavilion (~800 square feet) would be constructed near the Dungeness Beach boardwalk, providing shelter to visitors within the dune field. Kayak and/or canoe rentals could be available at Dungeness Dock or Beach Creek Dock if either location is chosen for the proposed activity. Existing or temporary infrastructure in the vicinity of the docks would be utilized. Considerations would be taken to protect sensitive natural and/or cultural resources. Additional compliance requirements would occur before implementation.
Bicycle Use and Management	Use of bicycles and Class 1, 2, and 3 electric bicycles (e-bikes) on the beach would be extended north between Sea Camp and Stafford Beach Crossings. Bicycles and e-bikes would still be permitted on all public roads, including the road between Sea Camp Dock and Sea Camp Campground, and parking areas per 36 CFR 4.30. Bike use would be prohibited on park trails and boardwalks, including the boardwalk from Sea Camp Campground to the beach. Bicycles, including e-bikes and traditional bikes, would be subject to the same 25 miles per hour speed limit as motor vehicles on the roads, and 25 miles per hour speed limit on the beach from August 1 through March 1. The speed limit for bicycles and e-bikes on the beach would continue to be reduced to 20 miles per hour from April 1 through July 31 and bicycle and e-bike use would remain prohibited from 30 minutes before sunset to 30 minutes after sunrise during turtle nesting season (April 1 and October 30). The park would actively manage the maximum number of personal bikes transported on the ferry and rented through the on-island concession. No more than 15 bicycles would be delivered per vessel and no more than 25 bicycles would be available for rent through the on-island concession. The total daily combined number of bicycles delivered and available for rent would not exceed 100. See Appendix B of the environmental assessment for a description of visitor capacity analysis related to this planning effort.
Visitor Services Provided by Concessionaire or Commercial Use Authorization	The park would expand the types of visitor services offered through commercial agreements. On-island bike and cart rentals would continue. An on-island kayak and/or canoe rental service, with the possibility of guided rental options, would be considered at Plum Orchard, Sea Camp, or Dungeness. Existing or temporary infrastructure would be utilized, and considerations would be taken to protect sensitive natural and/or cultural resources.

Management Topic	Description of Action Alternative
	Passenger ferry service from St. Marys, Georgia, could be expanded to include mid-afternoon ferry trips, earlier departures from the mainland, and/or a sunset return option. An additional Plum Orchard ferry stop would also be considered. The park would expand motorized concession tours to offer a Sea Camp to Plum Orchard tour that would allow day-users more flexibility to visit key attractions (Plum Orchard, Dungeness, the beach). In line with the 2004 legislation, the number of Lands & Legacies Tours plus the number of shorter, motorized concessions tours would not exceed eight per day. Visitors could have the opportunity to purchase health, safety, and essential camping items, as well as bookstore-appropriate merchandise (souvenirs, books, etc.), on the island.
Education and Signage	Increased visitor education would be provided (e.g., interpretation, signage, literature) regarding sensitive species, allowable visitor uses and locations, and how visitors can help protect island resources. Installation of signs would occur outside the wilderness area wherever possible. Additional signage regarding the no-wake zones and no dogs on South End Beach would be posted in appropriate locations.

NEPA COMPLIANCE

An environmental assessment for the proposed project has been prepared in accordance with the National Environmental Policy Act of 1969, as amended; regulations of the Council on Environmental Quality (40 CFR 1508.9); and NPS Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-Making. Section 106 of the National Historic Preservation Act of 1966, as amended compliance will be completed prior to any new ground disturbance. The environmental assessment presents a no-action and action alternative for the visitor use management plan and analyzes the potential impacts that these alternatives would have on the natural and human environment.

The environmental assessment has been published on the NPS's website, Planning, Environment and Public Comment (http://parkplanning.nps.gov/cuis) for a 30-day public review and comment period.

RELEVANT ENFORCEABLE POLICIES

Coastal Management Act – O.C.G.A. 12-5-320

"The Coastal Management Act provides enabling authority for the State to prepare and administer a coastal management program. This project includes proposed activities within the coastal zone of Georgia and therefore, this consistency determination is being submitted for to the Coastal Resources Division for approval under the Coastal Zone Management Act.

Coastal Marshlands Protection Act– O.C.G.A. 12-5-280

"The Coastal Marshlands Protection Act provides the Coastal Resources Division with the authority to protect tidal wetlands… Erecting structures, dredging, or filling marsh areas requires a Marsh Permit administered through the Coastal Management Program." The proposed project includes a new trail that, according to National Wetland Inventory mapping, may cross approximately 35 feet (0.0003 acres of shading) of estuarine and marine wetlands towards the proposed Beach Creak Backcountry campsite. Upon further design, the National Park Service would reach out to the

Coastal Resources Division to conduct a delineation, consider any ways to avoid impacts, and ensure the design and installation are compliant with Marsh Permit requirements.

Endangered Wildlife Act – O.C.G.A. 27-3-130

"Endangered Wildlife Act provides for identification, inventory, and protection of animal species that are rare, unusual, or in danger of extinction." A list of species of concern was provided by the Georgia Department of Natural Resources database. These species included the West Indian manatee, piping plover, wood stork, Wilson's plover, American oystercatcher, bald eagle, least tern, gopher tortoise, green, leatherback, loggerhead, and Kemp's ridley sea turtles, gopher frog, diamondback terrapin, velvet sedge, greenfly orchid, Florida wild privet, climbing buckthorn, soapberry, and hooded pitcherplant. Coordination with U.S. Fish and Wildlife Service and the National Marine Fisheries Service indicates that shortnose sturgeon, Atlantic sturgeon may be present in waters around the project area. While there are no proposed construction actions within the waters around Cumberland Island, commercial ferry service would be expanded and therefore measures would be implemented to minimize the potential for impacts to endangered wildlife both on land and in the surrounding waters. These mitigation measures are include in appendix I-1. The proposed action would have no to negligible impacts to these species. Consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service has been initiated and is ongoing.

Georgia Environmental Policy Act – O.C.G.A. 12-16-1

"The Georgia Environmental Policy Act (GEPA) requires that all State agencies and activities prepare an Environmental Impact Report as part of the decision-making process." An environmental assessment for the proposed project has been prepared by the National Park Service in accordance with the National Environmental Policy Act of 1969, as amended.

Georgia Erosion and Sedimentation Act – O.C.G.A. 12-7-1

"One provision of the Erosion and Sedimentation Act requires that land-disturbing activities shall not be conducted within 25 feet of the banks of any State waters unless a variance is granted (O.C.G.A 12-7-6-(15))." There are no proposed land-disturbing activities within 25 feet of the banks of any State waters.

Georgia Groundwater Use Act – O.C.G.A. 12-5-90

"The Groundwater Use Act charges the Board of Natural Resources with the responsibility to adopt rules and regulations relating to the conduct, content, and submission of water conservation plans, including water conservation practices, water drilling protocols, and specific rules for withdrawal and utilization of groundwater." The proposed project calls for the installation of one groundwater well; however, the well would be placed in a remote wilderness campground and withdrawals would not exceed 100,000 gallons per day. Installation and use of the well would comply with the Georgia Environmental Protection Division Groundwater Management Plan for Coastal Georgia.

Historic Areas – O.C.G.A. 12-3-50

The Department of Natural Resources has the authority to promote and increase knowledge and understanding of the history of this State by adopting and executing general plans, methods, and policies for permanently preserving historic structures. Proposed actions within this plan could result in minor impacts to archeological resources—assuming they exist in areas of new development—through the creation of new designated camping areas, trails, pavilions, and a comfort station. An increase in visitor traffic to/within Plum Orchard Historic District could lead to more interest in the grounds and Plum Orchard Mansion, although access into the historic structure(s)

would continue to be managed through ranger-guided tours. The National Park Service is committed to consult with the Georgia State Historic Preservation Officer prior to ground-breaking and construction activities that have the potential to affect historic properties in accordance with the 2008 Programmatic Agreement among the National Park Service, the Advisory Council for Historic Properties, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act and the Advisory Council for Historic Properties' regulations (36 CFR Part 800). Any necessary mitigation or avoidance measures related to the proposed actions would be adopted in consultation with the State Historic Preservation Officer and would likely limit any effects to the historic character of the identified historic districts. Any future physical changes to historic structures that may result from the implementation of the visitor management plan would be guided by future planning efforts and be the focus of future section 106 assessments of effects and consultation under the National Historic Preservation Act. As a result, there are no expected impacts to cultural resources and historic structures, cultural landscapes, and archeological resources from the actions proposed in this plan.

Septic Tank Law O.C.G.A. 31-2-7 and O.C.G.A. 31-3-5.1

In addition to references within the River Corridor Protection Act (O.C.G.A. 12-2-8), the Georgia Water Quality Control Act (O.C.G.A. 12-5-20), and others, the Septic Tank Law regulates "safe siting of septic systems to ensure that leachate from those systems does not infiltrate the waters of the State." The county board(s) of health are provided the authority and the responsibility of ensuring safe installation and maintenance of septic systems. The proposed project would include the installation of a septic system in association with the new comfort station. The system would be installed outside of the 100-year floodplain and in accordance with regulations specified by the Camden County Board of Health.

Shore Protection O.C.G.A. 2-5-230

"The Shore Protection Act is the primary legal authority for protection and management of Georgia's shoreline features including sand dunes, beaches, sandbars, and shoals, collectively known as the sand-sharing system. The value of the sand-sharing system is recognized as vitally important in protecting the coastal marshes and uplands from Atlantic storm activity, as well as providing valuable recreational opportunities. The Shore Protection Act defines allowable activities in shore areas and requires a permit for certain activities and structures on the beach." This project proposes a crosswalk/boardwalk to provide accessible access to Nightingale Beach. Construction of this structure would comply with requirements set forth in the Shore Protection Act. Design of the crosswalk would minimize the length of structure required to the extent practicable. Upon final design, the park staff will reach out to the Georgia Coastal Resources Division to discuss the requirements set fort in the act and the permitting process.

Georgia Water Quality Control Act – O.C.G.A. 12-5-20

"This Act makes it unlawful for any person to dispose of sewage, industrial wastes, or other wastes, or to withdraw, divert, or impound any surface waters of the State without a permit." The appropriate permits would be obtained for installation of one well and a comfort station with water utilities and a septic system. If applicable, a Spill Pollution Prevention Plan would be developed and implemented prior to the start of any construction activities.

Water Wells Standards O.C.G.A. 12-5-120

"The Water Wells Standards Act of 1985 provides standards for siting, constructing, operating, maintaining, and abandoning wells and boreholes and requires "that individual and non-public wells must be located as far removed from known or potential sources of pollutants as possible."

A licensed drilling contractor would be utilized to install the proposed well and use and installation of the new well would comply with the Water Wells Standards Act.

REQUIRED STATE, FEDERAL, AND LOCAL PERMITS

Permits are anticipated to be required from the Camden County Environmental Health Office (Septic Tank Permit) and Georgia Department of Natural Resources, Coastal Resources Division (Marsh Permit).

CONCLUSION

Implementation of the proposed Visitor Use Management Plan at Cumberland Island National Seashore would have reasonable foreseeable impacts on coastal resources and uses within the project area. The proposed project would have localized, minor adverse impacts on coastal resources within the existing project area. The proposed project would have localized, beneficial impacts to coastal resources and uses by improving visitor use management and the public's access to natural, historic, and recreational resources within the coastal zone. In accordance with Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972, as amended, the National Park Service has determined that the proposed action is consistent to the maximum extent practicable with the enforceable policies of Georgia's approved coastal management program. This determination is based on the review of the proposed project's conformance with the enforceable policies of the State's coastal program.

CONFORMITY

This application is submitted to ensure conformity with National Oceanic and Atmospheric Administration's Federal Consistency provisions (15 CFR 930), under which Federal agencies must determine if their proposed project directly affects Georgia's coastal zone. Georgia's coastal zone includes Camden County.

The National Park Service believes that the proposed project is consistent to the maximum extent practicable with the relevant enforceable policies of the GCMP document.

The proposed activity complies with the enforceable policies of Georgia's approved management program and will be conducted in a manner consistent with such program.

APPENDIX I-1: MITIGATION MEASURES

To minimize potential impact to the natural resources of Cumberland Island from the proposed alternative, actions included in this plan should be implemented with the following conditions:

- Educate ferry operators /boaters about sea life and boater responsibility.
- Enforce regulations related to the protection of manatees and sea turtles.
- Manage visitor activity adjacent to the Plum Orchard Mansion pond to prevent disturbance of wood storks and other wading birds. Ideally, the number of visitors directly adjacent to the pond should be controlled. If necessary, fencing could be designed to complement and blend with the historic cultural landscape. If fencing is not feasible, then a screen/barrier using natural vegetation should be developed to prevent access to the pond.
- Develop an educational program for concession staff and park interpretive staff that focuses on Threatened and Endangered (T&E) species identification and proper actions when species are encountered. Provide refresher training for staff on a regular basis and ensure that new personnel receive training promptly.
- NPS staff will monitor visitor activities on a regular basis for compliance and potential impacts to species of concern and natural resources in general.
- NPS stall will monitor visitor use of trails north of Stafford Beach Campground. Visitation in these areas is currently minimal and it will be necessary to monitor any potential impacts to the trails and immediate environment from increased use.
- NPS staff will monitor the beach for nesting American oystercatcher pairs, least tern colonies, and other species of concern. Informational signs and rope barriers will be used to identify nesting areas and restrict access where necessary to protect the species of concern.
- Staff involved with the annual sea turtle nest monitoring and protection project will continue to maintain records of disturbances to nest sites. A database will be developed to evaluate trends in human disturbance potentially related to implementation of the Preferred Alternative. Mitigation in the form of increased visitor education efforts and nest protection measures will be necessary to maintain a reduced pedestrian presence/disturbances.
- Seasonal trail or beach closures may be implemented during certain times of the year. The Park's resource managers will make this determination based on the presence of species of concern, their proximity to key visitor access routes or locations, and the likelihood that increased levels of human disturbance may negatively affect breeding or nesting success.
- Few park activities would generally occur from dusk to dawn, so artificial lighting would not be required, eliminating nighttime light and noise disturbances. Any potential future night programming would take precautions to minimize the use of lighting and noise disturbances.
- According to NPS *Management Policies* 2006, the National Park Service would strive to construct the proposed trails with a sustainable design to minimize potential environmental impacts. Development would not compete with, dominate park features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity. To the extent possible, the design and management of the proposed trails and boardwalks would emphasize environmentally sensitive construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings.
- Care would be taken to not disturb any sensitive wildlife species found nesting, hibernating, estivating, or otherwise living in or immediately nearby worksites. Resource management personnel would be notified/consulted when wildlife must be disturbed or handled.
- If sensitive resources are discovered during trail or campsite construction, construction would cease and the area would be surveyed in more detail so that impacts could be avoided or minimized and/or an alternative route established.

This page intentionally blank.

APPENDIX J: VEGETATION MAPPING AT CUMBERLAND ISLAND NATIONAL SEASHORE

Vegetation mapping at Cumberland Island National Seashore was completed in collaboration with the Southeast regional office of NatureServe in 2017 (NPS Veg 2017). For the purpose of this management plan, more descriptive information on those vegetation types identified in the 2017 mapping inventory are limited to those located where proposed actions would occur.

LIVE OAK – (CABBAGE PALMETTO) FOREST ALLIANCE / SOUTHEASTERN FLORIDA MARITIME HAMMOCK

The majority of the inland portion of the island was identified as Live Oak – (Cabbage Palmetto) Forest Alliance / Southeastern Florida Maritime Hammock during the 2017 mapping exercise. This evergreen, upland forest is dominated by oak species. The overstory is dominated by sand live oak (*Quercus* geminata), with live oak (*Quercus virginiana*) myrtle oak (Quercus myrtifolia) sometimes present. The dense shrub layer includes saw palmetto (Serenoa repens), coastalplain staggerbush (*Lyonia* fruticosa), rusty staggerbush (*Lyonia* ferruginea), devilwood (*Osmanthus* americanus *var*. americanus), redbay (Persea borbonia), and wax-myrtle (*Morella cerifera*). An understory of cabbage palmetto (*Sabal palmetto*) may also be present.

Sea Oats Temperate Herbaceous Alliance

Along the entire eastern shoreline of the island inland from the beach, dune grasses scattered with shrubs and forms make up the Sea Oats Temperate Herbaceous Alliance. Sea-oats (Uniola) is the dominant or codominant species in this area. The density of grasses varies depending on the stability of the dunes with more sparse vegetation found on more actively moving sand areas. This dune grassland community occurs almost exclusively on sandy, unstable, droughty substrates with no soil profile development. This community generally occurs on foredunes that receive the force of wind and salt spray but are beyond the influence of most storm tides. The effects of nearly continuous salt spray exclude most other species and maintain the vegetation type.

Southern Atlantic Coastal Plain Carolina Willow Dune Swale

In portions of the island, particularly between Sea Camp and Nightingale Beaches, the Southern Atlantic Coastal Plain Carolina Willow Dune Swale was mapped immediately inland from the Sea-oats herbaceous alliance. These seasonally flooded wetlands are found imbedded in live oak-dominated maritime forests in swales between coastal dunes in coastal Georgia. They are characterized by a short coastal plain willow (*Salix caroliniana*)-dominated overstory with swamp rosemallow (*Hibiscus grandifloras*) in the shrub layer. Wax myrtle (*Morella cerifera*) may also be found scattered throughout the shrub layer. Ground cover species depend on season and water levels in the stand.

Red-cedar – Live Oak – Cabbage Palmetto Marsh Hammock

Inland from the Sea Oats Alliance and willow dune swale, particularly in the southern portion of the island, a Red-cedar – Live Oak – Cabbage Palmetto Marsh Hammock was mapped. This vegetation type typically occurs adjacent to the salt marsh on narrow spits that may occasionally experience tidal overwash. Within this association, the understory includes the following dominant species. The tall-shrub layer is dominated by southern redcedar (Juniperus *virginiana var*. silicicola) and cabbage palmetto (*Sabal palmetto*). The more densely vegetated short-shrub layer is dominated by saw

palmetto (Serenoa repens). The ground cover layer is very sparse to sparse and is made up of tree and shrub seedlings (NPS 2017).

Seaside-Tansy Tidal Shrub Flat

Scatterings of Seaside-tansy Tidal Shrub Flat were mapped in the southern portion of the island. This deciduous shrubland usually occurs as a very narrow band adjacent and below tidal shrublands. Typically, this community is made up almost exclusively of bushy seaside-tansy (*Borrichia frutescens*). Soils in this vegetation type are very poorly to poorly drained sand.

APPENDIX K: IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Some impact topics have been eliminated from further analysis because the topics are not an issue for this project or the anticipated impacts would have no effect or an inconsequential effect on the topic. The following impact topics were considered but were then dismissed from further analysis for the reasons outlined below.

Untrammeled Wilderness Quality. The *untrammeled quality* of wilderness character focuses on the degree to which wilderness is unhindered and free from modern human control or manipulation. The untrammeled quality is degraded by actions that intentionally manipulate or control ecological systems (in contrast to the natural quality, which is degraded by the effects of modern civilization). Fire management, invasive species management, as well as wildlife research and management degrade the untrammeled quality, if/when they are implemented with the intent of manipulating the biophysical environment within Cumberland Island National Seashore Wilderness. NPS visitor use management actions within designated wilderness would be consistent across all alternatives and would not be undertaken to manipulate the biophysical environment. As a result, this impact topic was dismissed from further analysis.

Other Features of Value Wilderness Quality. The *other features of value quality* centers on unique and tangible features of a wilderness that are integral to the wilderness character of that place. These features may include cultural resource sites, paleontological sites, or any other features not included under the other four qualities that have ecological, geological, scientific, educational, scenic, or historical value. Numerous sites within the national seashore are evident from American Indian inhabitants, plantation regime, and Carnegie-era development. This quality is degraded by loss or damage to features integral to the character of wilderness because of increasing visitor use and routine maintenance needs. This plan's proposed actions and visitor use within designated and potential wilderness areas would avoid and protect the *other features of value quality*. As a result, this quality of wilderness character was dismissed from further analysis.

Floodplains. Elements of the proposed actions, including pavilions, proposed trails, and proposed backcountry campsites fall within a 100-year floodplain (FEMA 2017). Executive Order 11988, "Floodplain Management," requires the National Park Service and other federal agencies to evaluate the likely impacts of their actions in floodplains. NPS Director's Order 77-2: Floodplain Management and Procedural Manual 77-2: Floodplain Management provide the National Park Service with policies and procedures for complying with the executive orders. Executive Order 11988 and Director's Order 77-2 direct the National Park Service to examine ways to avoid, as much as possible, the short- and long-term, adverse impacts associated with occupancy, modification, or destruction of floodplains and to avoid indirect support of development and new construction in such areas where a practicable alternative can be considered. While these proposed elements would occur in the floodplain, there is no other practical alternative given the intent of the pavilions to serve beach bound visitors, and the nature of this island NPS unit.

To comply with Executive Order 11988, the planned elements would be designed to reduce property losses and risk to human safety. The proposed action would not alter flood flows and impacts on floodplain functions and values would be inconsequential because of the use of floodplain mitigation techniques and compliance with applicable standards, regulations, and policies. Therefore, this issue was dismissed from further analysis. A Statement of Findings in compliance with Director's Order 77-2 is required because the proposed project site would be located within the 100-year floodplain. A Draft Statement of Findings is provided as appendix H and is being circulated for public review and comment with this environmental assessment.

Cultural Resources. The current appearance of Cumberland Island is a result of the overlay of successive waves of human habitation and development from Indian settlement more than 4,000 years ago through the plantation era of the 18th and 19th centuries, and Carnegie-era development starting in the 1880s. Historic districts have been established around the historic features at Dungeness, Plum Orchard, Stafford, and High Point-Half Moon Bluff. Each of these historic districts, which include historic structures and associated landscape features, have been included in the National Register of Historic Places (NRHP). Archeological districts have been established at Rayfield and Table Point, and these districts have likewise been included in the National Register of Historic Places. The National Historic Preservation Act, as amended in 1992 (16 U.S.C. 470 et seq.); the National Environmental Policy Act of 1969 (42 U.S.C. 43) National Park Service's Director's Order 28, Cultural Resource Management Guideline (1997); Management Policies (2006); and Director's Order #12, Conservation Planning, Environmental Impact Analysis, and Decision Making (2001) require the consideration of impacts on historic resources—including archeological resources, historic structures, and cultural landscapes—listed in or eligible for listing in the National Register of Historic Places.

Proposed actions within this plan could result in minor impacts to archeological resources—assuming they exist in areas of new development—through the creation of new designated camping areas, trails, pavilions, and a comfort station. An increase in visitor traffic to/within Plum Orchard Historic District could lead to more interest in the grounds and Plum Orchard Mansion, although access into the historic structure(s) would continue to be managed through ranger-guided tours. The National Park Service is committed to consult with the Georgia State Historic Preservation Office (SHPO) prior to ground-breaking and construction activities that have the potential to affect historic properties in accordance with the 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act and ACHP regulations (36 CFR Part 800). If any impacts emerge as implementation projects occur, appropriate mitigations will be developed in order to achieve No Adverse Effects. Any necessary mitigation or avoidance measures related to the proposed actions would be adopted in consultation with the SHPO and would likely limit any effects to the historic character of the identified historic districts. Any future physical changes to historic structures that may result from the implementation of the visitor management plan would be guided by future planning efforts and be the focus of future section 106 assessments of effects and consultation under the National Historic Preservation Act.

Therefore the National Park Service proposes a finding of No Adverse Effects to historic properties from the high-level actions proposed in this plan and these impact topics were dismissed from detailed analysis in the associated environmental assessment.

Feral Horses. Cumberland Island is home to a population of approximately 120 to 190 nonnative feral horses. The horses are descendants of herds that were historically managed as both free-ranging and corralled livestock by residents on the island; however, by the mid-1900s the horses were roaming the island with little or no care from island residents. The herd is not actively managed (no food, water, veterinary care, or population control is provided) and the horses are affected by all the natural stressors faced by native wildlife. The horses are a frequent attraction for visitors and are accustomed to the presence of people. The horses regularly use the existing roads and trails on the island, and the proposed development activities under the preferred alternative would not measurably impact the horse's habitat or restrict their movement. In addition, an increase in visitation and the expanded access to various portions of the island would not be expected to alter their behavior given their affinity for areas heavily frequented by visitors and their ability to move freely on the island.

Species of Special Concern Not Carried Forward for Analysis. Special status species not analyzed in the document are not known to be present in the park, or the proposed actions are not anticipated to have any impact to the species. A listing of the species not analyzed, and the associated rationale may be found in table 12.

Environmental Justice. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minority and low-income communities. On August 17, 1994, the Secretary of the Interior established Department of Interior policy. This memorandum directs all bureau and office heads to consider the impacts of their actions and inactions on minority and low-income population and communities, to consider the equity of the distribution of benefits and risks of those decisions, and to ensure meaningful participation by minority and low-income populations in the department's wide range of activities where health and safety are involved.

To fulfill Executive Order 12898 in the context of the National Environmental Policy Act of 1969 (NEPA), the planning team identified that there are minority populations and low-income populations in the vicinity of St. Marys, Georgia. Neither alternatives would result in any identifiable human health effects. The impacts on the natural and physical environment resulting from any actions proposed in the alternatives would not disproportionately adversely affect any minority or low-income population or community or be specific to such populations or communities. The actions proposed in the alternatives would not result in any identified effects that would be specific to any minority or low-income community or that would disproportionately affect the traditionally associated peoples. Therefore, the topic of environmental justice was not retained for further analysis. Impacts from the proposed alternatives on local socioeconomics of the St. Marys, Georgia, community are described in the affected environment.

This page intentionally left blank.

APPENDIX L: REFERENCES

Byrne, M. W., S. L. Corbett, and J. C. DeVivo
2012 Vegetation community monitoring at Cumberland Island National Seashore
2009 Natural Resource Data Series NPS/SECN/NRDS—2012/260. National Park Service, Fort Collins, Colorado.

The Camden Partnership
2017 "Economic Impact of Naval Submarine Base Kings Bay on Camden County, GA." *Naval Submarine Base Kings Bay Economic Impact Summary 2017*. Retrieved from: http://www.thecamdenpartnership.org/economic-impact.html

City of St. Marys, Georgia
2019 "The Wharf at St. Marys." Retrieved from: http://www.stmarysga.gov/department/community_development/port_of_st_marys/document_center.php

Federal Aviation Administration (FAA)
2018 Draft Spaceport Camden Environmental Impact Statement. Office of Commercial Space Transportation. Available at: https://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/documents_progress/camden_spaceport/media/20180307_spaceport_camden_draft_eis_-_vol_1.pdf

2020 Updates to the proposed plan posted after the release of the Draft Spaceport Camden Environmental Impact Statement. Office of Commercial Space Transportation. Available at: spaceportcamden.us

2021 Final Spaceport Camden Environmental Impact Statement. Office of Commercial Space Transportation. Available at: https://www.faa.gov/sites/faa.gov/files/2022-04/Vol_1_SCC_FEIS_June2021.pdf

Fox, Adam G, Wirgin, Isaac I., Peterson, Douglas L.
2018 "Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia." *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 10:606–618, 2018. Accessed October 2019: https://afspubs.onlinelibrary.wiley.com/doi/epdf/10.1002/mcf2.10056.

Georgian Department of Natural Resources (GA DNR)
2018 "Boating Caution: Slow Down for Manatees, Sea Turtles." Wildlife Resources Division. Wednesday, April 18. Accessed online October 2019: https://georgiawildlife.com/boating-caution-slow-down-watch-out-manatees-sea-turtles.
2019 Sea Turtle Nest Monitoring System, Sea Turtle Conservation Program. Accessed October 2019: http://seaturtle.org/nestdb/index.shtml?view_beach=90&year=2019.
2022 "Boating Caution on the Coast: Slow Down, Watch for Sea Turtles, Manatees." Wildlife Resources Division. Thursday, March 31, 2022. Accessed online June 2022: https://georgiawildlife.com/boating-caution-slow-down-watch-out-manatees-sea-turtles-0

Interagency Visitor Use Management Council (IVUMC)
2016 "Visitor Use Management Framework." Retrieved from: https://visitorusemanagement.nps.gov/VUM/Framework.

Landres, P., C. Barns, S. Boutcher, T. Devine, P. Dratch, A. Lindholm, L. Merigliano, N. Roeper, and E. Simpson
2015 Keeping it Wild 2: An Updated Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System. US Forest Service, Fort Collins, CO. Gen. Tech. Rep. RMRS-GTR-340.

Landres, P., W. M. Vagias, and S. Stutzman
2012 "Using Wilderness Character to Improve Wilderness Stewardship." *Park Science* 28(3):44-48.

Nassau County Planning & Economic Opportunity Department
2015 Nassau County Comprehensive Plan 2010-2030. Retrieved from: https://www.nassaucountyfl.com/DocumentCenter/View/13160/2--Executive-Summary?bidId=

National Oceanic and Atmospheric Administration (NOAA)
2019 Sturgeon. Accessed October 2019: https://www.fisheries.noaa.gov/species/shortnose-sturgeon.

National Park Service
2016a Marine Vulnerability Assessment of Cumberland Island National Seashore, Determining the vulnerability of marine habitats at Cumberland Island National Seashore to climate change stressors. Natural Resource Report NPS/CUIS/NRR—2016/1281. Compiled by Katie McDowell Peek, Andy Coburn , Emily Stafford , Blair Tormey , Robert S.Young , Holli Thompson , Laura Bennett , and Alicia Fowler. August.

2016b National Park Service Procedural Manual #77-1: Wetland Protection. U.S. Department of the Interior National Park Service Natural Resources Stewardship and Science Water Resources Division Fort Collins, Colorado. Reissued June 21, 2016.

2017 Vegetation Mapping at Cumberland Island National Seashore, Natural Resource Report NPS/SECN/NRR – 2017/1511. September.

2018 Cumberland Island National Seashore website. "Feral Horses." Last Updated August 15, 2018. Accessed October 2019 at: https://www.nps.gov/cuis/learn/nature/feral-horses.htm.

2019 Cumberland Island National Seashore – Sea Turtles. Accessed October 2019: https://www.nps.gov/cuis/learn/nature/sea-turtles.htm

2000 Cumberland Island National Seashore Draft Planning Effort and Environmental Impact Statement. Chapter 4b: Natural Resource Management Plan. December.

NatureServe Explorer
2022 Danaus plexippus, Monarch Butterfly Profile. Page last published 9/1/2022. Accessed September 2022: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.108245/Danaus_plexippus

Nielsen, T., Palmatier, S. M., and A. Proffitt.
2019 "Literature Review: Recreation Conflicts Focused on Emerging E-bike Technology." *Boulder County Open Parks and Space*

Peek, Katie, Tormey, B., Thompson, H., and Young, R.
2022 Coastal Hazards & Sea-Level Rise Asset Vulnerability Assessment Protocol: Updated Project Description & Methodology.

Spencer, Jeremy.
2018 St. Marys Gateway Project: Nearly 8 years later, is it poised for a developer? *All on Georgia*. Retrieved from: https://allongeorgia.com/camden-local-news/st-marys-gateway-project-nearly-8-years-later-is-it-poised-for-a-developer/

St. Marys Convention & Visitors Bureau.
n.d. St. Marys Convention & Visitors Bureau. Retrieved from: https://www.visitstmarys.com/where-to-stay.html

U.S. Fish and Wildlife Service (USFWS)
2019a Information for Planning and Consultation (IpaC), Migratory Birds. Retrieved 1 August 2019.

2019b Midwest Region Endangered Species. Great Lakes Piping Plover, Cause of Declines and Continuing Threats. Accessed October 2019: https://www.fws.gov/midwest/endangered/pipingplover/piplthreats.html

2019c National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed 1 October 2019. http://www.fws.gov/wetlands/.

2022a Information for Planning and Consultation (IpaC), resource list. Retrieved 7 September 2022.

2022b Wetlands Data Limitations, Exclusions, and Precautions. U.S. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed 6 September 2022. https://www.fws.gov/node/264582

U.S. Geological Survey
2016 Spatial and Temporal Assessment of Back-Barrier Erosion on Cumberland Island National Seashore, Georgia, 2011–2013. Scientific Investigations Report 2016 –5071. By Daniel L. Calhoun and Jeffrey W. Riley. Prepared in cooperation with the National Park Service.

United States Census Bureau
2019 American Community Survey 5-Year Estimates, 2014-2018.

Wilderness Connect
2019 Cumberland Island Wilderness. Available on the Internet at: https://wilderness.net/visit-wilderness/?ID=145#atdModal-origin. Accessed September 16, 2019.

Zomlefer, Wendy B, David E. Giannasi, Kelly A. Bettinger, S. Lee Echols, and Lisa M. Kruse
2008 Vascular Plant Survey of Cumberland Island National Seashore, Camden County, Georgia. Castanea, Vol. 73, No. 4 (December), pp. 251-282. Available at: https://www.jstor.org/stable/20433976

APPENDIX M: GLOSSARY

Active and Passive Recreation: Active and passive recreation are referenced in the fundamental resources and values of the park's foundation document, specifically that "an uncrowded setting provides opportunities for both passive and active outdoor recreation". Active recreation includes things like paddling, hiking, biking, backpacking, and camping. Passive recreation includes contemplative activities such as exploring historic sites, watching birds, and observing wilderness and natural areas.

Adaptive management: A process that allows the development of a plan when some degree of biological and socioeconomic uncertainty exists. It requires a continual learning process, a reiterative evaluation of goals and approaches, and redirection based on increased information and changing public expectations. Also see Departmental Manual 522-1 and associated technical guide.

Affected environment: Existing biological, physical, social, and economic conditions of an area that are subject to change, both directly and indirectly, as a result of a proposed human action.

Alternatives: Sets of management elements that represent a range of options for how, or whether, to proceed with a proposed project. An environmental impact statement analyzes the potential environmental and social impacts of the range of alternatives presented.

Archeological resources: Historic and prehistoric deposits, sites, features, structure ruins, and anything of a cultural nature found within, or removed from, an archeological site.

Area of potential effect: The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The area of potential effect is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking.

Best management practices: Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land- and water-management measures that avoid or minimize adverse impacts to natural and cultural resources. Best management practices may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

CEQ Regulations: The Council on Environmental Quality (CEQ) was established by the National Environmental Policy Act (see NEPA) and given the responsibility for developing federal environmental policy and overseeing the implementation of the National Environmental Policy Act by federal agencies.

Commercial use authorization: A permit that authorizes suitable commercial services to park area visitors in limited circumstances.

Concession contract: Defined in 36 *Code of Federal Regulations* (CFR) Part 51 as a binding written agreement between the National Park Service and a concessioner to provide specified visitor services within a park area.

Cumberland Island National Seashore (CUIS): The park unit for which this management plan was written. The National Park Service utilizes four letter acronyms to identify each park unit.

Cultural landscape: A geographic area—including both cultural and natural resources and the wildlife or domestic animals therein—associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes, not

mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

Cumulative impact: An impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.

Desired condition: Statements of aspiration that describe resource conditions, visitor experiences and opportunities, and facilities and services that an agency strives to achieve and maintain in a particular area.

Environmental consequences: This section of an environmental assessment or Environmental Impact Statement describes the impacts a proposed action would have on resources. Direct, indirect, and cumulative impacts, both beneficial and adverse, are analyzed. The context, duration, and intensity of impacts are defined and quantified as much as possible.

Environmental Assessment (EA): A public document required under the National Environmental Policy Act that identifies and analyzes activities that might affect the human and natural environment.

Environmentally preferable alternative: The alternative within the range of alternatives presented in an environmental impact statement that best promotes the goals of the National Environmental Policy Act. In general, this is the alternative that causes the least damage to the environment and best protects natural and cultural resources. In practice, one alternative may be more preferable for some environmental resources while another alternative may be preferable for other resources.

Extent Necessary Determination (END): An analysis to determine the proper types and levels of commercial services in the wilderness.

Facilities: Buildings and the associated supporting infrastructure such as roads, trails, and utilities.

Finding of No Significant Impact: The public document describing the decision made on selecting the "preferred alternative" in an environmental assessment. See "environmental assessment."

Historic building: For the purposes of the National Register of Historic Places, a building can be a house, barn, church, hotel, or similar construction, created principally to shelter human activity. "Building" may also refer to a historically and functionally related unit, such as a courthouse and jail, or a house and barn.

Historic district: An area that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. To be eligible for the National Register of Historic Places, a district must be significant, as well as an identifiable entity. It must be important for historical, architectural, archeological, engineering, or cultural values.

Historic property: Any prehistoric or historic building, site, district, structure, or object that is included in, or eligible for, inclusion in the National Register of Historic Places. Types of historic properties can include archeological sites, historic cultural landscapes, and traditional cultural properties.

Historic site: The location of significant event that can be prehistoric or historic in nature. It can represent activities or buildings (standing, ruined, or vanished). It is the location itself that is of historical interest in a historic site, and it possesses cultural or archeological value regardless of the

value of any structures that currently exist on the location. Examples of historic sites include shipwrecks, battlefields, campsites, natural features, and rock shelters.

Historic structure: For the purposes of the National Register of Historic Places, the term "structure" is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter. Examples of structures include bridges, gazebos, and highways.

Indicator: Specific resource or experiential attributes that can be measured to track changes in conditions so progress toward achieving and maintaining desired conditions can be assessed.

Management zone: A geographical area for which management directions or prescriptions have been developed to determine what can and cannot occur in terms of resource management, visitor use, access, facilities or development, and park operations.

Mitigation: Activities that will avoid, reduce the severity of, or eliminate an adverse environmental impact.

National Environmental Policy Act (NEPA): The federal act that requires the development of an environmental impact statement or environmental assessment for federal actions that might have substantial environmental, social, or other impacts.

National Historic Landmark (NHL): A nationally significant historic place designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States.

National Historic Preservation Act (NHPA): In 1966, Congress established a program for the preservation of additional historic properties through the country. The NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects on historic properties through the section 106 process.

National Park Service Organic Act: In 1916, the National Park Service Organic Act established the National Park Service to "promote and regulate use of parks" and defined the purpose of the national parks as "to conserve the scenery and natural and historic objects and wild life therein and to provide for the enjoyment of the same in a manner and by such means as will leave them unimpaired for the enjoyment of future generations." This law provides overall guidance for the management of the park.

National Parks and Recreation Act: The 1978 law that establishes national parks, monuments, recreation areas, and other recreation lands under the jurisdiction of the DOI. This law continues to be amended as new lands are acquired or boundaries of existing lands are changed.

National Register of Historic Places: As a result of the National Historic Preservation Act, the NPS's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources.

No-action alternative: The alternative in a plan that proposes to continue current management direction. "No action" means the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

National Park Service management policies: A policy is a guiding principle or procedure that sets the framework and provides direction for management decisions. NPS policies are guided by and

consistent with the US Constitution, public laws, executive proclamations and orders, and regulations and directives from higher authorities. Policies translate these sources of guidance into cohesive directions. Policy direction may be general or specific. It may prescribe the process by which decisions are made, how an action is to be accomplished, or the results to be achieved. The primary source of NPS policy is the publication *Management Policies 2001*. The policies contained therein are applicable service-wide. They reflect NPS management philosophy. Director's Orders supplement and may amend management policies. Unwritten or informal "policy" and people's various understandings of NPS traditional practices are never relied on as official policy.

Planning: A dynamic, interdisciplinary, process for developing short- and long-term goals for visitor experience, resource conditions, and facility placement.

People per day (PPD): A measurement for visitor capacity referring to the total number of people that pass through an area throughout the day.

Preferred alternative: The alternative within the range of alternatives presented in an environmental impact statement that the agency believes would best fulfill the purpose and need of the proposed action. While the preferred alternative is a different concept from the environmentally preferable alternative, they may also be one and the same for some environmental impact statements.

Public comment process: A formalized process required by the National Environmental Policy Act in which the National Park Service must publish a Notice Of Availability in the Federal Register to provide public notice that a draft environmental impact statement and associated information, including scoping comments and supporting documentation, is available for public review and input pursuant to the Freedom Of Information Act. In addition, the National Park Service must conduct formal public hearings on the draft environmental impact statement when required by statute or the CEQ NEPA regulations.

Public scoping process: Scoping is a formalized process used by the National Park Service to gather the public's and other agencies' ideas and concerns on a proposed action or project. A Notice Of Intent is published in the Federal Register announcing the agency's intent to prepare an environmental impact statement and a request for written public/other agency scoping comments to further define the goals and data needs for the project. In addition, although not required by the National Environmental Policy Act nor the CEQ NEPA regulations, public scoping meetings may be held and integrated with any other early planning meetings relating to the proposed project.

Site hardening: Any development that creates an impervious ground surface, usually as a way to direct visitor use and reduce impacts to resources.

Scoping: See "public scoping process."

Soundscape: The component of the acoustic environment that can be perceived and comprehended by humans.

Threshold: Minimally acceptable conditions associated with each indicator.

Treatment: Work carried out to achieve a historic preservation goal. The four primary treatments are preservation, rehabilitation, restoration, and reconstruction (as stated in *The Secretary of the Interior's Standards for the Treatment of Historic Properties*).

Trigger: A point that reflects a condition of concern for an indicator that is enough to prompt a management response to ensure that desired conditions continue to be maintained before the threshold is crossed.

User: Visitors and employees in the park.

Visitor capacity: The maximum amounts and types of visitor use that an area can accommodate while achieving and maintaining desired resource conditions and visitor experiences consistent with the purposes for which the area was established. A component of visitor use management.

Visitor-created trail: An informal, non-designated trail between two locations. Visitor-created trails often result in trampling and stresses to sensitive vegetation types.

Visitor experience: The perceptions, feelings, and reactions a park visitor has in relationship with the surrounding environment.

Visitor use: The types of recreation activities visitors participate in, numbers of people in an area and their behavior, the timing of use, and distribution of use within a given area.

Visitor use levels: The quantity or amount of use a specific area receives, or the amount of parkwide visitation on a daily, monthly, or annual basis.

Wetland: Wetlands are defined by the US Army Corps of Engineers (CFR, Section 328.3[b], 1986) as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Acronyms and Abbreviations

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB	Decibel
dBA	Decibel (on the "A-weighted" scale)
EPA	US Environmental Protection Agency
GIS	Geographic Information System(s)
GMP	General Management Plan
IVUMC	Interagency Visitor Use Management Council
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
PPV	People per View
PAOT	People at One Time
PEPC	Planning, Environment, and Public Comment
SHPO	State Historic Preservation Officer
USFWS	US Fish and Wildlife Service

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under US administration.

CUIS 640/186425
November 2022

National Park Service
U.S. Department of the Interior

CUMBERLAND ISLAND NATIONAL SEASHORE • GEORGIA

VISITOR USE MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT • NOVEMBER 2022