National Park Service
U.S. Department of the Interior

Cape Hatteras National Seashore
North Carolina

Relocation of the Bodie Island U.S. Coast Guard Station Complex

Environmental Assessment

November 1, 2008

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Environmental Assessment

Relocation of the Bodie Island U.S. Coast Guard Station Complex Cape Hatteras

National Seashore • North Carolina

Summary

The National Park Service (NPS) preserves and protects a unique collection of U.S. Life-Saving (USLS) Service and U.S. Coast Guard (USCG) Stations at Cape Hatteras National Seashore (the Seashore). The collection is unique because it contains at least one representative structure from each of the four USLS Service construction periods (1874; 1878; 1880-1888; and 1894-1905). The remaining vestiges of the USLS Service and USCG facilities are among the most culturally significant resources at Cape Hatteras National Seashore.

Cape Hatteras National Seashore proposes to relocate the Bodie Island U.S. Coast Guard Station Complex (the Complex) from its current location to a nearby site on Bodie Island to protect the structures from encroachment of the Atlantic Ocean and shoreline erosion. The Complex is comprised of three historic structures: 1879 USLS Station, 1916 Boat House, and 1925 USCG Station. Each of these is locally significant as representative of the architecture and operations of the USLS Service and USCG on the Outer Banks of North Carolina. The Complex is listed on the National Register of Historic Places.

A coastal risk assessment identified that the Complex was the Seashore's cultural resource site at the greatest risk of loss due to the combined threats of shoreline retreat, inlet formation, and overwash. Since NPS policy is to allow natural shoreline processes to occur unimpeded on barrier islands and North Carolina law does not allow hardening shorelines, relocation of these historic structures is the only means by which they can be protected from the Atlantic Ocean within the next five years. Impairment of the Seashore's cultural resource integrity would result if the 1879 USLS Station was irreparably damaged.

The Complex is currently located north of Coquina Beach on Bodie Island. The relocation site is located west of the Coquina Beach parking area and the intersection of NC 12 and Lighthouse Bay Drive, approximately 0.6 linear miles south of the site currently occupied by the Complex. Although relocation of the structures would reduce the potential for impairment of the Seashore's cultural resource integrity, relocation of historic structures would be an adverse effect. Mitigation of this adverse effect would be achieved by maintaining historic orientation, arrangement, and uses at the relocation site. Relocation of the structures would result in negligible to minor, adverse impacts to some natural resources in the short-and long-term.

Public Comment

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment may be made publicly available at any time. While you may 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.

Michael B. Murray, Superintendent
Cape Hatteras National Seashore
1401 National Park Drive
Manteo, NC 27954

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

This environmental assessment (EA) presents alternatives for the proposed relocation of the three historic structures comprising the Bodie Island U.S. Coast Guard (USCG) Station Complex within Cape Hatteras National Seashore (the Seashore). The Complex is comprised of the 1879 U.S. Life-Saving (USLS) Station, the 1916 Boat House, and the 1925 USCG Station.

This EA further analyzes the potential impacts these alternatives would have on the natural, cultural, and human environment. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; regulations of the Council on Environmental Quality (CEQ) (40 CFR 1508.9); and National Park Service (NPS) Director's Order (DO) #12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (2001a). This EA also complies with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

PURPOSE AND NEED

The significant cultural resources of Cape Hatteras National Seashore consist mainly of the lighthouses and the remaining vestiges of the USLS Service and USCG facilities. The NPS preserves and protects a unique collection of USLS and USCG Stations at the Seashore. The collection is unique because it contains at least one representative structure from each of the four USLS Service construction periods (1874; 1878; 1880-1888; and 1894-1905). Of the USLS stations constructed in the 1876 Carpenter Gothic style on the Outer Banks, the 1879 USLS Station on Bodie Island is the only one remaining in the public trust. All of the other 1876 Carpenter Gothic style USLS stations on the Outer Banks have either been destroyed by storms or sold as government surplus property to the private sector. The privately owned buildings have been relocated, many have been structurally modified, and none have provisions for the retention of their historic character. The 1925 USCG Station on Bodie Island is one of two remaining in the public trust. The Complex is listed on the National Register of Historic Places because, as individual buildings and collectively as a group, they represent the operations and architecture of the USLS Service and the USCG on the Outer Banks of North Carolina.

The NPS faces the challenge of balancing the management of significant natural and cultural resources in a dynamic coastal barrier island environment. Cape Hatteras National Seashore proposes to relocate the Complex from its current location to a nearby site on Bodie Island to protect the structures from encroachment of the Atlantic Ocean and shoreline erosion. A coastal risk assessment identified that the Complex was the Seashore's cultural resource site at the greatest risk of loss due to the combined threats of shoreline retreat, inlet formation, and overwash (Buie 1996). Since NPS policy is to allow natural shoreline processes to occur unimpeded on barrier islands and North Carolina law does not allow hardening shorelines, relocation of these historic structures is the only means by which they can be protected from the Atlantic Ocean within the next five years.

Objectives

Relocation of the Complex is being proposed with the intent of meeting the following objectives:

- Protecting the structures from encroachment of the Atlantic Ocean and shoreline erosion;
- Protecting the historic and structural integrity of the structures;
- Minimizing the distance from the sites upon which the structures were originally constructed;

- Maintaining the historic relationship of the structures to the Ocean and the other maritime life-saving structures built along the coastline;

- Maintaining the historic use of the structures;

- Avoiding or minimizing adverse impacts to cultural and natural resources, including direct adverse impacts to archeological resources and wetlands; and

- Avoiding or minimizing adverse impacts to park operations and visitor experience of the Seashore.

Project Site Description

Cape Hatteras National Seashore is located in Dare and Hyde Counties, along the Outer Banks of North Carolina, and extends for over 70 miles on Bodie, Hatteras and Ocracoke Islands (Figure 1). The islands constitute a narrow barrier island chain which is typically less than one-mile wide, bordered by the Pamlico-Albemarle Sound to the west and by the Atlantic Ocean to the east.

Various landmarks and sites on Bodie Island are referenced in this EA (Figure 2), with an emphasis on the site currently occupied by the Complex and the relocation site on Lighthouse Bay Drive. For the purposes of this EA, the "project area" includes the environment surrounding the site currently occupied by the Complex and the relocation site.

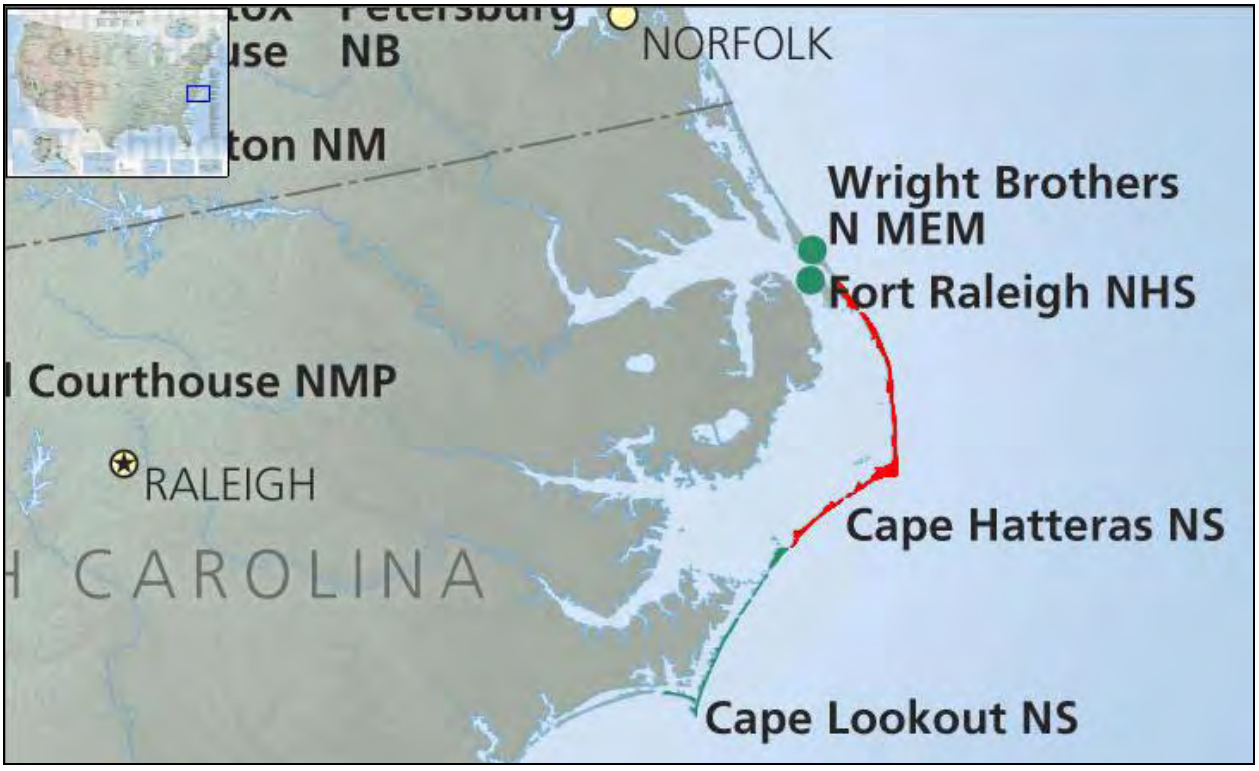

Figure 1: Map of National Park units on the Outer Banks of North Carolina, including Cape Hatteras National Seashore (shown in red). (NPS Harpers Ferry Center 2007)

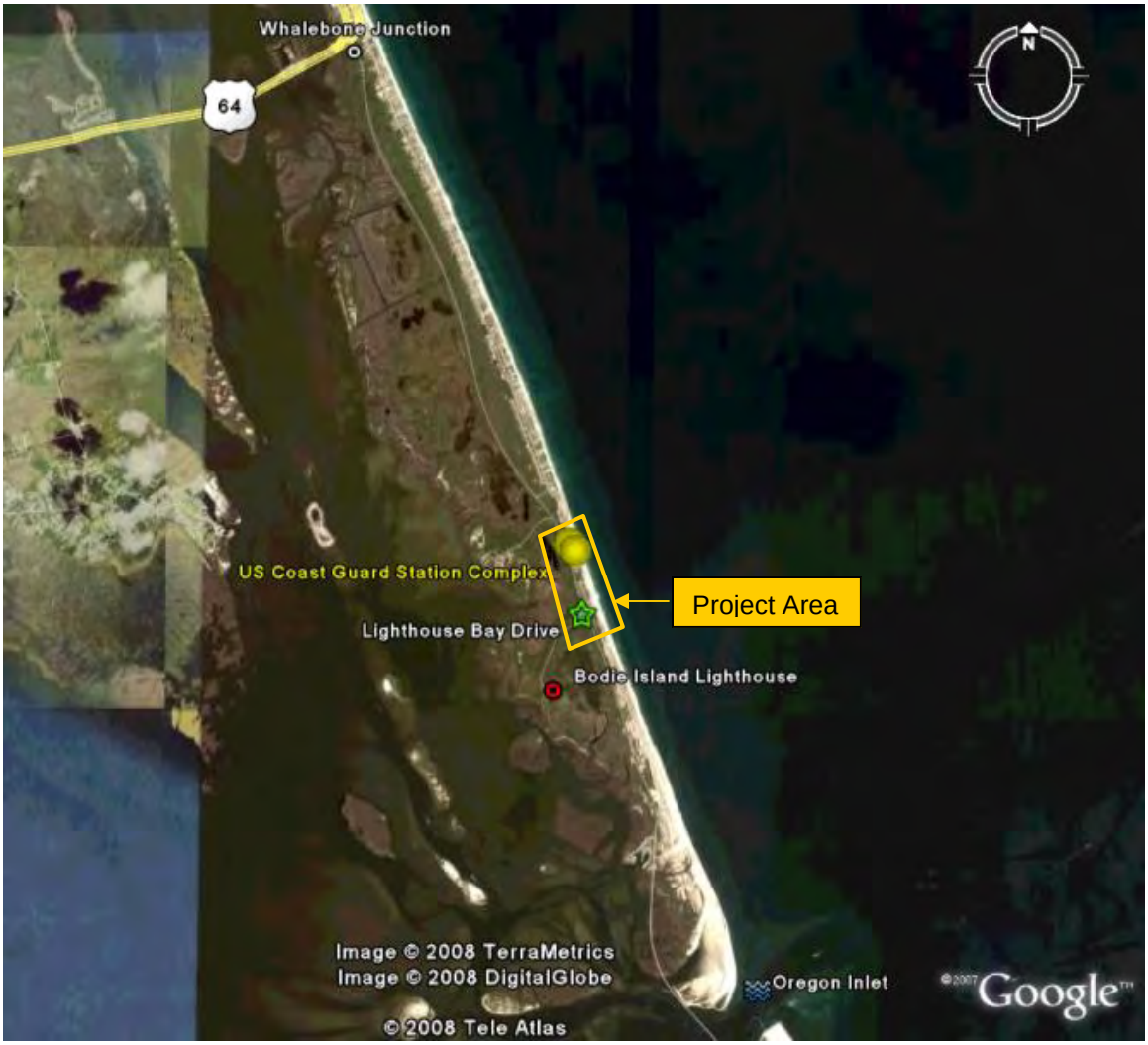

Figure 2: Map of the project area and frequently referenced landmarks on Bodie Island. (Google Earth 2007)

The site currently occupied by the Complex on Bodie Island is centrally located on the island, at approximately 5.2 linear miles south of the Seashore's northern entrance at Whalebone Junction and 4.5 linear miles north of Oregon Inlet.

The relocation site is located approximately 0.6 linear miles south of the current site occupied by the Complex. The relocation site is located at the intersection of North Carolina Highway 12 (NC 12) and Lighthouse Bay Drive. Lighthouse Bay Drive terminates approximately 1 mile southwest of the NC 12/Lighthouse Bay Drive intersection, at the Bodie Island Lighthouse.

Purpose and Significance of the Seashore

Cape Hatteras National Seashore was authorized by Congress on August 17, 1937 (50 Stat. 669), and the Secretary of the Interior issued an order establishing Cape Hatteras National Seashore on January 12, 1953. The authorizing legislation states that the purpose of the Seashore "shall be, and is hereby, established, dedicated and set apart as a national seashore for the benefit and enjoyment of the people." The act continues, "Except for certain portions of the area, deemed to be especially adaptable for recreational uses… the said area shall be permanently reserved as a primitive wilderness and no development of the project or plan for the convenience of visitors shall be undertaken which would be

incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing in this area" (NPS 1981, 1984b).

The vision statement and resource management goals are addressed generally in the General Management Plans (GMP) and Statements for Management each national park unit, and then expanded upon in park-specific Resource Management Plans. The vision statements and goals for the Seashore are summarized below:

- To identify and preserve cultural resources of the Outer Banks, particularly those relating to man adapting to life at the Ocean's edge.

- To manage the Seashore in ways that will enhance the natural processes of barrier island dynamics and of succession of native vegetation and wildlife and will mitigate the impacts of human interference with these processes.

The Seashore is recognized for its natural, historical, and recreational values, including its beaches, excellent fishing, diverse bird life, and historic landmarks. The following significance statements have been formulated for the Seashore (NPS 2007):

- The Seashore was authorized in 1937 and established in 1953 as our nation's first national seashore and preserves publicly accessible barrier islands where audiences should be able to experience unimpaired seashore values such as clean Ocean water and beaches, undeveloped island and water resources, natural sounds, solitude, seashore viewsheds, and night skies.

- The Seashore is part of a natural system with a geologic process unique to barrier islands and is characterized by constant change both seasonally and daily, subtle and dramatic.

- The Seashore is characteristic of the ecological habitats normally associated with barrier island systems including beach, dunes, maritime forest, inlets, freshwater wetlands, salt marshes, and tidal flats.

- The Seashore is a permanent and temporary home to a great variety of terrestrial and aquatic life, including several protected species, which depend on the fragile and special island habitats that result from the transition between the northern and southern habitat zones and the dynamic nature of these barrier islands.

- The Seashore, a Globally Important Bird Area, is a critical natural landform along the Atlantic Flyway serving as major resting, feeding, and breeding grounds for migratory birds.

- The Seashore contains archeological and historical resources that provide clues to livelihood and activities of Native American life, self-sufficient and isolated island communities, waterfowl hunting camps, commercial fisheries, lighthouses, USLS stations, USCG stations, shipwrecks, military structures and sites, a U.S. Weather Station, and sites associated with the Civilian Conservation Corps.

- The Seashore is an outdoor recreational resource offering outstanding opportunities for hiking, camping, boating, sailing, nature study, solitude and reflection, beach combing, fishing, hunting, shellfishing, swimming, birding, biking, picnicking, and many other leisure activities.

- The Seashore is an educational resource offering outstanding opportunities for visitors and educational groups to learn about stewardship, preservation, and the Seashore's unique natural and cultural resources.

Project Background

The Seashore's *General Management Plan / Development Concept Plan / Environmental Assessment* (1984) identified that relocation of the Complex was needed as soon as possible to prevent their loss to the Atlantic Ocean. The NPS has also identified the need to rehabilitate the structures following their relocation.

Relationship of the Proposed Action to Previous Planning Efforts

Relocation of the Complex is consistent with the objectives of Seashore's *General Management Plan / Development Concept Plan / Environmental Assessment* (NPS 1984); *Statement for Management* (NPS 1985); *Resources Management Plan* (NPS 1996)*; Bodie Island Life-Saving Station and Boat House Historic Structure Report* (Oppermann 2005a); *Bodie Island Coast Guard Station Historic Structure Report* (2005b); *Bodie Island Life-Saving Station: Relocation and Preservation Treatment* (NPS 2006b); and *Bodie Island Coast Guard Station: Relocation and Stabilization* (NPS 2006c).

Scoping

The Council on Environmental Quality (CEQ 1978) guidelines for implementing the National Environmental Policy Act and the NPS' National Environmental Policy Act (NEPA) guidelines contained in Director's Order # 12: *Conservation Planning, Environmental Impact Analysis and Decision Making Handbook* (NPS 2001a) provide the framework for scoping. Scoping is an early and open process completed by the NPS to:

- Determine important issues.
- Eliminate issues that are not important or relevant.
- Identify relationships to other planning efforts or documents.
- Define a time schedule of document preparation and decision-making.
- Define purpose and need, agency objectives and constraints, and the range of alternatives.

Scoping was initiated in 2004 by the staff of Cape Hatteras National Seashore and resource professionals of the NPS's Southeast Regional Office. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined what the likely issues and impact topics would be, and identified the relationship, if any, of the proposed action to other planning efforts at the Seashore. Since 2004, the NPS has identified potential relocation sites and associated impacts to park resources, visitor use and enjoyment of the Seashore, and other impacts associated with relocation of these structures. The NPS has consulted with other Federal, state and local agencies and stakeholders about this proposed action.

A coordination letter was prepared for the purpose of outlining the proposed action and requesting agency concerns/comments related to the proposed action. A copy of this letter is included in Appendix A. This letter was submitted to the North Carolina Department of Administration's State Environmental Review Clearinghouse on February 28, 2007. The State Environmental Review Clearinghouse assists state and federal government agencies in meeting their coordination requirements under the National Environmental Policy Act and serves as a means to notify potentially affected state/local agencies and the public of proposed development activities in their jurisdiction. The process is intended to provide decision makers with the information that would enable them to make an informed decision of the environmental consequences of a proposed action.

Public scoping for the proposed action was facilitated through the NPS Planning, Environment, and Public Comment (PEPC) website. A brief project synopsis, including the purpose and need of the proposed action and alternatives descriptions, were posted on the website along with instructions for providing comments. The comment period was also announced via press release on the Seashore's website on January 11, 2007 and published in a newspaper articles in *The News & Observer* (January 26, 2007) and in *The Virginian-Pilot* (February 4, 2007). A 34-day public comment period was open from January 15, 2007 through February 17, 2007. A public scoping meeting was held on January 31, 2007 at the Wright Brothers National Monument in Kill Devil Hills, North Carolina. For further scoping and public participation information, see "Chapter 5: Consultation and Coordination" and "Appendix A: Relevant Correspondence."

Potential issues and concerns associated with the proposed relocation were identified by input from park staff; local, state, and federal agencies; local and regional organizations; and the public. The issues and impact topics are described in the section that follows.

ISSUES AND IMPACT TOPICS

Issues and concerns affecting this proposal were identified from past NPS planning efforts, input from environmental groups, and state and federal agencies. The major issues and concerns identified for the proposed action included:

- Immediate need to preserve the historic structures;
- Vulnerability of the primary dune and the recently increasing frequency of emergency repairs necessary to protect the historic structures;
- Support for and concerns related to the relocation, restoration, and/or rehabilitation of the historic structures;
- Maintenance of the historic orientations and spatial arrangement of the structures to the Atlantic Ocean and each other;
- Maintenance of the historic uses of the structures;
- Limited availability of viable relocation sites; and
- Wetlands avoidance.

Specific impact topics were developed for discussion focus, and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and Executive Orders; NPS *Management Policies* (NPS 2006a); and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Impact Topics Included in This Document

Cultural Resources

The NHPA, NEPA, NPS DO #12, and NPS DO #28: *Cultural Resource Management Guidelines* require consideration of impacts on cultural resources either listed on or eligible for listing on the National Register.

Historic Structures and Districts

A historic structure is defined by the NPS as "a constructed work, usually immovable by nature or design, consciously created to serve some human act" (DO #28, 113). For a structure to be listed on or eligible for listing on the National Register, it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The National Register Bulletin #15: *How to Apply the National Register Criteria for Evaluation* (NPS 1990) provides a comprehensive discussion of these characteristics. The Complex is on the National Register of Historic Places. Each of the three structures comprising the Complex is historic, with local significance as representative of the USLS Service and the USCG operations and architecture on the Outer Banks of North Carolina. According to DO #28, the deliberate neglect of a historic structure on the National Register is prohibited unless approved by the Regional Director. Adverse impacts to historic structures on the National Register would result in the short-term from implementation of either of the alternatives considered in this EA. Therefore, the impact topic of historic structures and districts is analyzed.

Natural Resources

Geologic Resources

The NPS *Management Policies* (NPS 2006a) states that the NPS will preserve and protect geologic resources as integral components of park natural systems. As used here, the term "geologic resources" includes both geologic features and geologic processes. Cape Hatteras National Seashore faces the challenge of balancing management of significant natural and cultural resources, such as historic structures and transportation corridors, in this dynamic coastal barrier island system (NPS 1984). The project area is located in the coastal plain geologic formation and is comprised of beach sand, deposited within the past 10,000 years (Fullerton et al. 2003). These barrier islands have been and will continue to be manipulated by natural shoreline processes (e.g., erosion, deposition, dune formation, overwash, inlet formation, and shoreline migration), high energy weather events (e.g., nor'easters, tropical storms, hurricanes), and human activity.

When and where possible, the Seashore has previously demonstrated success in relocating significant cultural resources threatened by shoreline erosion and inlet formation, while avoiding and minimizing adverse impacts to the environment. Perhaps the most well-known of these undertakings was the relocation of the Cape Hatteras Lighthouse on Hatteras Island in 1999. Many of the Seashore's other culturally significant resources face the same threat of demise by perpetuation of natural processes. In recent years, approximately 0.3 mile long stretch of dune located immediately behind the Complex has been rebuilt and sand fencing has been installed as an emergency measure to protect the structures since 2007. Since the proposed action would change the short- and long-term management of geologic features and processes in the project area, the impact topic of geologic resources is analyzed.

Soils

NPS policy is to actively seek to understand and preserve the soil resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources. The NPS *Management Policies* (NPS 2006a), NPS DO #77: *Natural Resources Management* and other NPS and Cape Hatteras National Seashore policies provide general direction for the protection of soils. Since the proposed action would change the short- and long-term management of soils in the project area, soil is analyzed as an impact topic.

Floodplains

Executive Order 11988, "Floodplain Management," and NPS DO #77-2: *Floodplain Management* require an examination of impacts to floodplains and potential risk involved in placing facilities within

floodplains. The entire project area is located on Bodie Island, a coastal barrier island which is bounded to the east by the Atlantic Ocean and to the west by the Pamlico Sound. According to FEMA Flood Insurance Rate Maps, the project area is located within the 100-year floodplain. The proposed relocation of these structures would impact 0.35 acres in the 100-year floodplain. Therefore, the impact topic of floodplains is analyzed. In accordance with DO #77-2 (NPS 2007b), a draft Statement of Findings for Floodplains describing the impacts to floodplain resources was developed and is included as Appendix C in this EA.

Vegetation

NPS policy is to protect the natural abundance and diversity of all naturally occurring vegetation communities. The NPS *Management Policies* (NPS 2006a), NPS DO #77, and other NPS and Cape Hatteras National Seashore policies, provides general direction for the protection of vegetation. Vegetation within the project area would be impacted under the alternatives considered. Therefore, the impact topic of vegetation is analyzed.

Fire Fuels

NPS policy is to take action to prevent or minimize the impact of wildland, prescribed, and structural fires on cultural resources, including the impact of suppression and rehabilitation activities (NPS DO#58: *Structural Fire Management*, *Reference Manual 58*). Wildland fire and the absence of wildland fire have played a role in the overall occurrence and distribution of other vegetation at Cape Hatteras National Seashore. A *Fire Management Plan* (NPS 2001b) for the Outer Banks Group of National Parks (Cape Hatteras National Seashore, Fort Raleigh National Historic Site, and Wright Brothers National Memorial) includes recommendations for fire break establishment and maintenance to protect significant cultural resources. Bodie Island is designated as Fire Management Unit 3 and all wildland fires in this unit, regardless of origin, will be suppressed using the appropriate management response. In most cases, fire suppression may be indirect attack using the highway, area roads, power line right-of-way, or water drainage features as control lines. The proposed action would include vegetation clearing to protect these three historic structures. Therefore, the impact topic of fire fuels is analyzed.

Wildlife and Wildlife Habitat

NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. The 2006 NPS *Management Policies* (NPS 2006a), NPS DO #77: *Natural Resources Management*, and other NPS and Cape Hatteras National Seashore policies provide general direction for the protection of wildlife and wildlife habitat. The project area includes four natural vegetation communities that are characteristic of this barrier island system in North Carolina and which support characteristic native wildlife species. Habitat alteration and displacement of common wildlife species that are commonly encountered within the Seashore would result from the proposed action. Therefore, the impact topic of wildlife and wildlife habitat is analyzed.

Lightscape

In accordance with NPS *Management Policies* (NPS 2006a), the NPS strives to preserve natural, ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light. The proposed relocation of the three historic structures would result in a change in location of lighting fixtures and would alter the lightscape in the project area. Therefore, the impact topic of lightscape is analyzed.

Park Operations

Since their acquisition by the NPS in 1953, the structures have continued to be used in a manner consistent with their historic uses for life-saving operations and staff housing. Since 2007, the NPS has been maintaining a stretch of 0.3 miles of dune immediately east of the Complex on an emergency basis.

Since the relocation of these structures would change impacts on park operations, the impact topic of park operations is analyzed.

Impact Topics Dismissed From Further Consideration

The following impact topics were initially considered but were dismissed from further analysis because the resource is not present in the project site or because any potential impacts would be negligible. They include museum collections; archeological resources; cultural landscapes; sea level rise; surface and ground waters; wetlands; prime and unique farmlands; air quality; soundscape; species of special concern; ecologically critical areas; visual resources; ethnographic resources; Indian Trust resources; energy requirements and conservation potential; socioeconomic environment; and environmental justice. A brief rationale for the dismissal of each impact topic is provided below.

Cultural Resources

Museum Collections

The NPS defines a museum object as a material thing possessing functional, aesthetic, cultural, symbolic, and/or scientific value, usually movable by nature or design. Museum objects include prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens that are part of a museum collection (DO #28, 137). No museum objects are included as part of the proposed action. Therefore, museum collections was dismissed as an impact topic in this document.

Archeological Resources

The NPS defines an archeological resource as any material remains or physical evidence of past human life or activities that are of archeological interest, including the record of the effects of human activities on the environment. Archeological resources are capable of revealing scientific or humanistic information through archeological research (DO #28, 67). Cape Hatteras National Seashore contains 63 known archeological sites, including archeological structures, prehistoric sites, and shipwrecks. An archeological investigation was conducted in April 2007 at the site currently occupied by the Complex and the relocation site. The investigation revealed that there is no evidence of significant archeological resources present at either site and that the removal, transport, and relocation of the structures poses no threat to buried archeological resources (NPS SEAC 2007).

The proposed relocation of these historic structures would result in the abandonment of the concrete foundation of the USCG Station and the wood pilings supporting the USLS Station and Boat House. These original structural members would continue to be threatened by the eroding beach and submersion under the rising waters of the Atlantic Ocean. At that time, they would be considered submerged cultural resources, as the original site of the Cape Hatteras Lighthouse is. Therefore, archeological resources was dismissed as an impact topic in this document.

Cultural Landscapes

As described in DO #28, a cultural landscape is 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 (DO #28, 87). Cultural landscapes are expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built.

A district is defined by the NPS as a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, structures, structures, or objects united by past events or aesthetically by plan or physical development. A district would also comprise individual elements separated geographically but linked by association or history. (36CFR60.3)

The "Bodie Island Life-Saving/Coast Guard Station" was added to the National Register of Historic Places as a Historic District in 1979. Its district was described as "an arbitrarily drawn rectangle located 1.2 miles north of the Bodie Island Lighthouse." At the time of its nomination, the NPS had not developed or defined the phrase "cultural landscape." Therefore, this historic district does not have a cultural landscape defined. Defining the cultural landscape for the Complex is beyond the scope of this EA but will be considered during the NHPA process for the stabilization and rehabilitation of the Complex.

Although the Bodie Island Lighthouse historic district does have a defined cultural landscape, neither the historic district nor the cultural landscape of the Bodie Island Lighthouse would be impacted by the proposed action. Therefore, cultural landscape was dismissed as an impact topic in this document.

Natural Resources

Sea Level Rise

Of the potential impacts of global climate change, sea level rise would have the greatest impact on coastal North Carolina. Global sea level is rising at an approximate rate of 2 mm/year (Douglas et al. 2001) and is expected to accelerate over the next 100 years (USGCRP 2001). A rise of 5-16 mm/year within the next 100 years is predicted for the mid-Atlantic coast of the United States (Titus and Wang 2008).

According to a recent assessment of Cape Hatteras National Seashore's vulnerability to sea level rise, the Seashore is highly vulnerable to inundation in the long-term and rapid shoreline retreat in the short-term (Pendleton et al. 2005). The most vulnerable areas within the Seashore are those areas with the highest occurrence of overwash and the highest rates of shoreline change. Given the predicted worst case scenario of sea level rise for the mid-Atlantic coast of the United States at a rate of 16 mm/year (Titus and Wang 2008), sea level would rise 80 mm (3.15 inches) during the 5-year lifespan of this EA. This predicted rise in sea level would have no effect on implementation of the proposed action nor would the proposed action have an impact on sea level rise. Furthermore, no reasonably foreseeable actions would alter overwash occurrences or shoreline change. Therefore, the impact topic of sea level rise was dismissed from further analysis.

Surface and Ground Waters

The NPS *Management Policies* (NPS 2006a), NPS DO #77, along with the Clean Water Act and other federal, state, and local regulations, provide general direction for the protection of surface and ground waters. The Atlantic Ocean bounds Bodie Island to the east, while the Pamlico-Albemarle Sound bounds the Island to the west. Natural and artificial water courses are present in the project area. However, the proposed relocation of the buildings and installation of septic systems to support building use would not result in alteration of any natural water courses in the project area.

All applicable laws, regulations, and guidance for the siting of septic systems in Dare County have been considered in the development of the action alternative, Alternative B. The intent of Dare County's Sanitary Sewage System rules include rendering wastewater that is ecologically safe and does not pose a threat to public health (NCDENR 1999). Of the applicable rules considered in the development of the building relocation and support facility siting, the septic systems would be located more than 5 feet from any building foundation, 10 feet from any water line or property line, and 50 feet from any surface water (including U.S. Army Corps of Engineers [USACE] wetland). There are no private water supply sources, public water supplies, or permanent storm water retention ponds or pools near the relocation site. None of the relocated buildings would have a basement. The proposed relocation of the three historic structures would result in the abandonment of the septic systems at the currently occupied site. The abandonment of the septic systems would be done in accordance with federal, state, and local standards and procedures.

Stormwater management in coastal North Carolina has recently been a topic of great public interest. The State recently amended its Coastal Stormwater Rule (NCDENR 2008) were considered in the alternatives development process and applicable conditions of the Rule were met for the proposed relocation of the Complex. Since the proposed action would result in the disturbance of more than 10,000 square feet (sq. ft.), the provisions of the amended Coastal Stormwater Rule apply to the project. All of the disturbance associated with this project would be within 0.5 mile of and draining to "Class SA" waters (market shellfishing, salt water). The proposed action would be considered low-density development and less than 12 percent of the relocation site would be built-upon using impervious materials. Stormwater runoff would be transported primarily by the natural, established, vegetated buffer (50 feet wide) adjacent to US ACE wetlands, allowing stormwater runoff to flow in a diffuse manner to protect surface waters from degradation due to development activities.

The proposed action was developed in accordance with applicable regulations and guidance to minimize adverse impacts on the natural and human environment. Since the proposed action would result in negligible impacts (at or below the level of detection), surface and ground waters was dismissed as an impact topic in this document.

Wetlands

Executive Order 11990, "Protection of Wetlands," and NPS DO #77-1: *Wetland Protection* defines the NPS goal to maintain and preserve wetland areas. Wetlands are abundant on Bodie Island. However, there are no wetlands within the area of temporary disturbance at the site currently occupied by the structures. The nearest wetland is over 125 feet from the exterior wall of each of the three structures. At the relocation site, there are no wetlands within the area of temporary disturbance associated with each of the buildings. At the relocation site, the nearest wetland is over 50 feet from the limits of vegetation clearing and grubbing for the site north of Lighthouse Bay Drive and 23 feet from the site south of Lighthouse Bay Drive. Wetlands present in the vicinity of the project have been identified and delineated by the USACE and NPS. Wetland impacts have been avoided through on-site investigation and the wetland/upland interface by the NPS and USACE at the relocation site. In a letter dated April 2, 2008, the USACE concurred that the proposed action would have no impact on the wetlands in the vicinity of the relocation sites (see Appendix A). Therefore, the impact topic of wetlands was dismissed.

Prime and Unique Farmlands

In August 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to NRCS, none of the soils in the project area are classified as prime and unique farmlands. Therefore, prime and unique farmlands was dismissed as an impact topic in this document.

Air Quality

The 1963 Clean Air Act (CAA), as amended, requires land managers to protect air quality. Section 118 of the CAA further requires parks to meet all federal, state, and local air pollution standards, and NPS *Management Policies* (NPS 2006a) addresses the need to analyze potential impacts to air quality during park planning. All of North Carolina's coastal counties are located in the Environmental Protection Agency's Ozone Attainment Area. Although construction and vegetation clearing activities would have some impacts to air quality, they would be fleeting and negligible. Therefore, the impact topic of air quality was dismissed.

Soundscape

As described in NPS *Management Policies* (NPS 2006a) and NPS DO #47: *Sound Preservation and Noise Management*, preservation of natural soundscapes associated with national park units is an important part of the NPS mission. Natural soundscapes exist in the absence of human-caused sound. As defined, natural soundscapes do not exist at the site currently occupied by the structures nor at the site for the proposed relocation. Therefore, the impact topic of soundscape was dismissed.

Species of Special Concern

In addition to NPS polices and management guidelines, the Endangered Species Act of 1973, as amended provides for the protection of rare, threatened, and endangered species (floral and faunal). In a letter dated 28 March 2007, the U.S. Fish and Wildlife Service (USFWS) noted that the relocation sites do not support any habitat that would directly affect any federally-listed species. Federally and state listed species lists are maintained by the North Carolina Natural Heritage Program (NC NHP). The site-specific request for a list of species historically or currently present within the project area identified seven plant and 23 wildlife species of concern.

In a letter (dated March 28, 2007) and an email correspondence (dated August 1, 2008), the USFWS confirmed that the proposed relocation of the Complex would have no affect on federally-protected species. Field surveys for federally and state listed species of concern were conducted (Hartrampf and Quible & Associates, P.C. 2008). None of the federally or state listed species were observed. Therefore, species of special concern was dismissed as an impact topic for further analysis.

Ecologically Critical Areas

Cape Hatteras National Seashore is located in the Southeastern Coastal Plain Bird Conservation Regions and is one of coastal North Carolina's 15 designated Globally Important Bird Areas (American Bird Conservancy 2007). The proposed relocation of the structures would have no impact on the Seashore's designation as a Globally Important Bird Area.

Within the Seashore, there are eight registered Significant Natural Heritage Areas (NC DENR 1987). Two of these occur on Bodie Island: Bodie Island Roadside Ponds and Marshes; and Bodie Island Lighthouse Pond. Of these, the Bodie Island Lighthouse Pond is closest to the project area. The project area is located over 800 (0.15 miles) north of the northern extent of this Significant Natural Heritage Area. The Pond is habitat for several rare plant and animal species, and large numbers of waterbirds frequent the pond and its surroundings. The proposed relocation of the structures would have no impact on the designation of any registered Significant Natural Heritage Area.

For these reasons, the impact topic of ecologically critical areas was dismissed from further analysis. Impacts on wildlife use of habitat in the vicinity of the proposed action are analyzed under the wildlife and wildlife habitat impact topic.

Visual Resources

The NPS Management Policies (NPS 2006a) notes that the enjoyment of park resources and values by the people of the Unites States is part of the fundamental purpose of all parks. The Organic Act also states that units of the National Park System are charged with conserving park scenery, along with all the natural and cultural resources which contribute to important views. In the evaluation of visual resources, both the visual character of the site and the quality of the viewshed are analyzed. A viewshed comprises the limits of the visual environment associated with the proposed action including the viewsheds within, into, and out of the site. Neither the current location nor the relocation site are within the viewshed of the Bodie Island Lighthouse. The proposed relocation of the structures would have no new impact to the

Bodie Island Lighthouse viewshed. Therefore, visual resources was dismissed as an impact topic in this document.

Visitor Use and Experience

Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006a). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. None of the structures within the Complex are currently open to the public. Although the general history of the USLS Service and USCG are interpreted by the NPS, this USCG Station has not specifically been interpreted.

North Carolina's Mountains-To-Sea Trail is a 935-mile trail stretching from Clingman's Dome in Great Smoky Mountains National Park, through Cape Hatteras National Seashore, and terminating at Jockey's Ridge State Park in the town of Kill Devil Hills. Within Cape Hatteras National Seashore, the trail runs primarily along the Ocean beach with a segment in the woods from the Frisco campground to the Cape Hatteras Lighthouse and a segment on NC 12. The Mountains-To-Sea Trail segment on Bodie Island runs along the Ocean beach.

The proposed action would not result in any change to visitor use and experience of the Seashore. Therefore, the impact topic of visitor use and experience was dismissed.

Ethnographic Resources

An ethnographic resource is defined as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it (DO #28, 157). Cape Hatteras National Seashore's ethnographic resources are associated with the historic fishing villages. The proposed action would have no impact on the Seashore's ethnographic resources. Therefore, ethnographic resources was dismissed as an impact topic in this document.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian Trust resources from a proposed action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to American Indian tribes. There are no known Indian Trust resources in at the site currently occupied by the structures or at the site of the proposed relocation. Therefore, the impact topic of Indian Trust resources was dismissed as an impact topic in this document.

Energy Requirements and Conservation Potential

The CEQ guidelines for implementing NEPA require examination of energy requirements and conservation potential as a possible impact topic in environmental documents. Cape Hatteras National Seashore strives to incorporate the principles of sustainable design and development into all facilities and park operations. The objectives of sustainability are to design structures to minimize adverse impacts on natural and cultural values; to reflect their environmental setting; to maintain and encourage biodiversity; to construct and retrofit facilities using energy efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. The action alternatives below subscribe to and support the practice of sustainable planning and design in part by improving heating and

cooling systems, improving building insulation, using low volatile organic compound paint, and low-flow electric fixtures.

This EA addresses the relocation of three historic structures and installation of facilities (e.g., parking, septic systems) in support of their continued use for park operations. Restoration of the structures and associated sustainable design elements are beyond the scope of this EA. The design of support facilities has been accomplished by meeting applicable local, state, and federal regulations in addition to incorporating best management practices elements. Therefore, energy requirements and conservation potential was dismissed as an impact topic in this document.

Socioeconomic Environment

The proposed relocation of three historic structures would neither change local and regional land use nor impact local businesses or other agencies. Therefore, socioeconomic environment was dismissed as an impact topic in this document.

Environmental Justice

Executive Order 12898, "General 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 the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action and alternatives would not result in any identifiable effects to minority or low-income communities since the current location and proposed location are both within the Seashore's boundary. Therefore, environmental justice was dismissed as an impact topic.

CHAPTER 2: THE ALTERNATIVES

This chapter describes alternatives for relocation of three historic structures (1879 USLS Station, 1916 Boat House, and 1925 USCG Station), comprising the Bodie Island US Coast Guard Complex. Alternatives for the proposed action are intended to preserve historic structures and continue to meet the Seashore's operational needs. This EA examines two alternatives: a No-Action Alternative (Alternative A) and one action alternative (Alternative B). Each alternative includes a discussion of the following elements: building preservation and maintenance; National Register of Historic Places status; dune maintenance and rebuilding under normal conditions and following a dune blow-out due to a high energy weather event; and Bodie Island District Law Enforcement and other park operations.

Reasonable alternatives should be evaluated, and the reason given for elimination of alternatives not subjected to detailed analysis. Under CEQ guidance, reasonable alternatives are those "that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant…An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable."

ALTERNATIVE A (No-Action)

The No-Action Alternative describes the action of continuing the present management operation and condition. It does not imply or direct discontinuing the present action or removing existing uses, developments, or facilities. The No-Action Alternative provides a basis for comparing the management direction and environmental consequences of the proposed action and must always be considered in every EA. Should the No-Action Alternative be selected, NPS would respond to future needs and conditions associated with the continued protection of the Complex and the current uses of these structures without major actions or changes in course.

Under this alternative, the three structures would remain at their current locations and in their current conditions. The three structures would be maintained in good condition to the maximum extent possible because of their uniqueness as representative architectural styles in a complete set of historically significant structures. In accordance with the Seashore's GMP and NPS-28, all feasible measures would be implemented to avoid impairment and minimize adverse effects on their integrity.

In the event of damage of any of the three historic structures, the NPS would perform a site visit to assess damage to their structural and historic integrity. The NPS would consult with other federal, state, and local agencies (e.g., USFWS, State Historic Preservation Office [SHPO], North Carolina Department of Environment and Natural Resources) on the extent of damage and develop a mutually agreeable approach for the continued protection of these historic structures with minimal adverse impacts to other resources in the vicinity. In the event that the historic structures are irreparable, the NPS would coordinate with the SHPO to prepare the necessary documentation to remove them from the National Register and collect, store, and catalogue any special architectural features or hardware in the Seashore's museum collection.

The 0.3-mile long stretch of the dune located immediately east of the Complex would continue to be repaired by the NPS, as needed to be protective of the historic structures and not adversely impact species of special concern (Figure 3). Repair and maintenance of dunes for a period of three years (2007 through 2010) within the Seashore was previously determined to be consistent with the State's coastal management program (see Appendix B). The NPS would consult with the State's coastal management program during 2010 to continue dune repair and maintenance activities for subsequent years as needed.

The NPS would continue to mechanically move the displaced sand, to reestablish continuity in the dune height. Sand fencing would be installed, as needed, to facilitate the deposition of blowing sand atop the dune to achieve the desired dune height and width (Figure 4).

If sand accumulates on the driveway and parking area serving the Bodie Island District Law Enforcement operation at the USLS Station and Boat House, then the NPS would remove the accumulated sand to restore access for the Law Enforcement operation. If a dune blow-out results in sand accumulation on NC 12 that impedes vehicular passage, the NPS would work with the North Carolina Department of Transportation (NCDOT) to restore normal traffic passage on NC 12.

The NPS would relocate the Bodie Island District Law Enforcement Office from the USLS Station and Boat House at any time if deemed necessary by the NPS for the safety of park employees and maintenance of the Seashore's law enforcement and life guard operations. These offices would be relocated to a nearby site on Bodie Island to ensure continuity in emergency response services. The USCG Station would remain unoccupied.

Figure 3. View from the Bodie Island Lighthouse gallery deck, looking north east at the repaired dune line behind the Complex, as of January 2008. (left: USLS Station; right: USCG Station)

Figure 4. View of repaired dune behind the USLS Station, as of May 2008. (center: USCG Station; right: USLS Station and Boat House)

ALTERNATIVE B (NPS Preferred Alternative)

The preferred alternative presents the NPS proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. All actions described in the preferred alternative are consistent with the Seashore's *General Management Plan / Development Concept / Amended Environmental Assessment* (1984) and related park documents.

Under this alternative, all three historic structures would be relocated to a nearby site on Bodie Island (Figure 5). Support facilities (e.g., walkways, parking areas, septic mound systems and other utilities) would be installed to facilitate use of the buildings for park operations. The relocation site is located approximately 0.6 miles south of the site currently occupied by the structures.

Relocation of the NPS Bodie Island Law Enforcement Office to the Bodie Island Maintenance Area would be necessary to allow for relocation of the USLS Station and Boat House. The Law Enforcement operation would return to the USLS Station and Boat House as quickly as possible following relocation of these structures. The USCG Station is currently not in use. The structure would be used in support of park operations in the future.

The USLS Station and Boat House are currently on wood piling foundation, while the USCG Station is currently located on a concrete foundation. All three structures would be released from their foundations to be transported to the relocation site. The concrete foundation of the USCG Station and the wood pilings for the USLS Station and Boat House would remain on-site because these components are considered culturally significant features of the historic structures. The access roads, parking areas, and concrete walkways would remain on-site to considered for use as potential staging areas for a future action (see "Widening and Repaving of NC 12" section in Chapter 4 of the EA for details) and potentially removed as mitigation for floodplain impacts resulting from that action. Septic systems would be removed or closed in accordance with applicable state and federal regulations. The site would be revegetated. The 0.3-mile long stretch of the dune located immediately east of the Complex would not be repaired unless dune blow-out results in sand accumulation on NC 12 that impedes vehicular passage. The NPS would work with NCDOT to restore normal traffic passage on NC 12.

The relocated structures would be secured on wood pilings at a finished floor height above the base flood elevation of 10 feet, in accordance with the National Flood Insurance Program V zone construction standards. Support facilities (e.g., walkways, parking areas, septic mound systems and other utilities) would be installed to facilitate use of the structures for park operations. The building configuration proposed was designed with the primary objectives of maintaining the historic groupings and orientation of the structures to each other and the Ocean, facilitate park operations using these structures, and avoid impacts to wetlands. The USCG Station would be relocated to a site immediately north of the Lighthouse Bay Drive, while the USLS Station and Boat House would be relocated to a site immediately south of the Lighthouse Bay Drive. This arrangement mimics the historic arrangement and alignments of the structures as they were in 1925, following the construction of the USCG Station building (Figure 6).

Figure 5: Project area map, showing the current locations and relocation site the USCG Station and Life-Saving Station / Boat House on Bodie Island within Cape Hatteras National Seashore. (Google Earth 2007)

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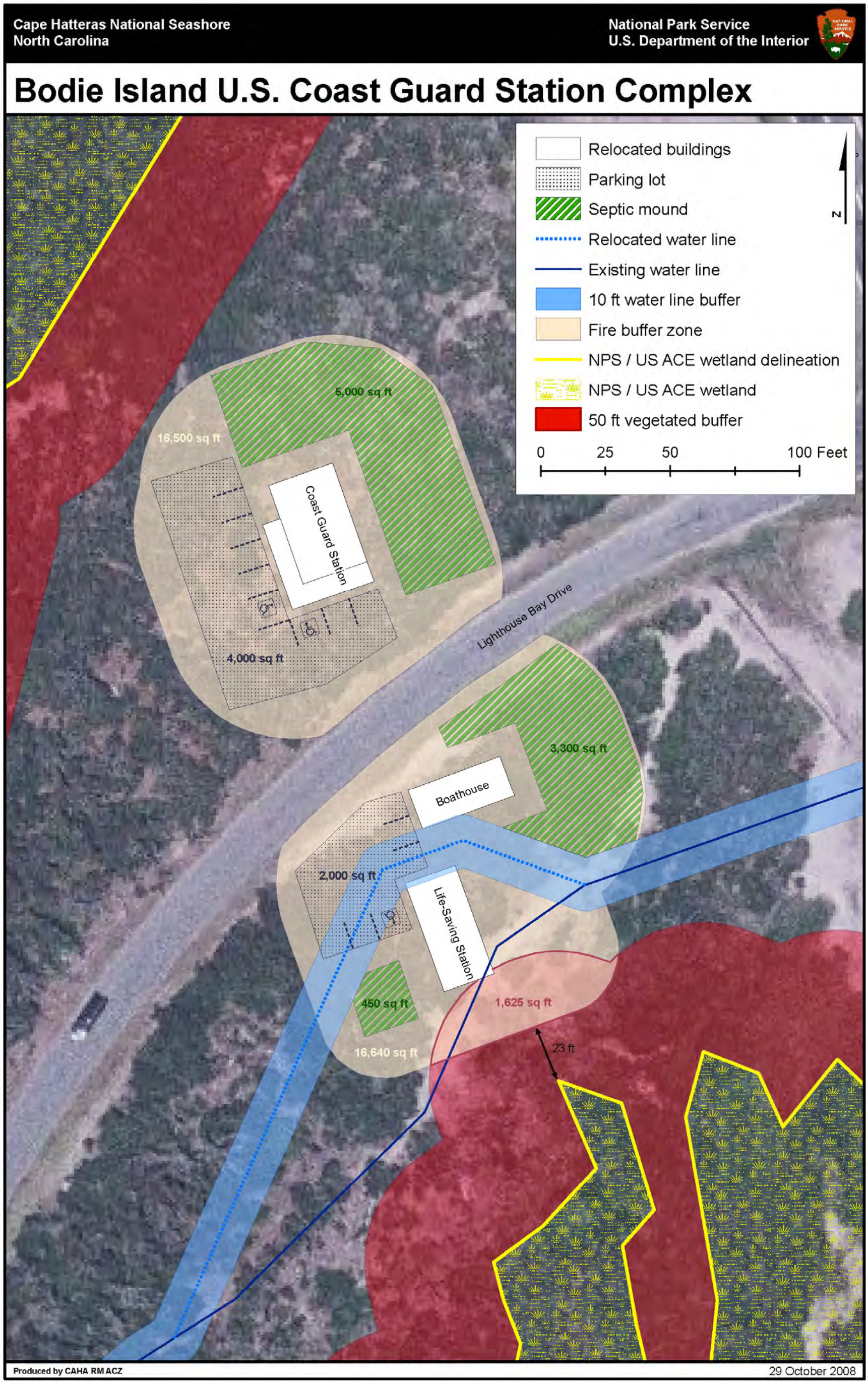

Figure 6: Relocation site plan.

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Site Preparation and Relocation Activities

The site preparation, building relocations, and restoration of the Bodie Island District Law Enforcement operation from the USLS Station and Boat House would be planned to begin as soon as reasonably possible. The construction and building relocation schedules would be developed and coordinated through consultation with local, state, and other Federal agency Law Enforcement, utility companies, and public information entities. The NPS would generate press releases for timely publication in local and national newspapers and other media.

Current Site

Preparation of the USLS Station and Boat House for relocation would require the temporary relocation of the Bodie Island District Law Enforcement operation. All reinforcements needed to assure the structural integrity of the structures would be completed prior to the move.

All building preparation and vehicle activities would be limited to a 0.5 acre surrounding the USLS Station / Boat House site and the USCG Station site, for a total area of potential vegetation disturbance upto 1 acre. The buildings would be extracted from their sites by vehicles using the existing paved driveways, parking areas, and roads.

The concrete foundation of the USCG Station and the wood pilings for the USLS Station and Boat House would remain on-site because these components are considered culturally significant features of the historic structures. The access roads, parking areas, and concrete walkways would remain on-site to considered for use as potential staging areas for a future action (see "Widening and Repaving of NC 12" section in Chapter 4 of the EA for details) and potentially removed as mitigation for floodplain impacts resulting from that action. Septic systems would be removed or closed in accordance with applicable state and federal regulations. The site would be revegetated.

Relocation Site

An archeological investigation of the relocation site was completed by the NPS in April 2007, and no archeological resources were discovered. Therefore, preparation of the relocation site would begin as soon as reasonably possible with on-site oversight by the NPS.

The relocation site would be prepared for the installation of the structures and associated support facilities (Figure 6). A construction access entrance would be established where the driveway entrance and parking areas would be established following building relocation. Construction vehicles would be restricted to the uplands, and silt-fencing and other site-appropriate materials would be installed to avoid impacting wetlands in the project vicinity. The clearing and grubbing of vegetation at the relocation site would include the clearing of 0.76 acre. This cleared area would facilitate the relocation of the structures and serve as a fire break in the long-term. A fire buffer zone, extending from the exterior walls from each building would be established in accordance with the Seashore's *Fire Management Plan* (NPS 2001b). The fire buffer zone width would be a maximum of 50 feet on all four sides of the USCG Station and Boat House; the fire buffer zone width would be a maximum of 50 feet on the north, east, and west faces of the USLS Station and would be a maximum of 27 feet on the south face of the USLS Station to avoid impacting the wetland to the south (23 feet to the south of the vegetation clearing and grubbing limits; Figure 6). The total acreage to be cleared north of Lighthouse Bay Drive for the relocation of the USCG Station is 0.38 acre. The total acreage to be cleared south of Lighthouse Bay Drive for the relocation of the USLS Station and Boat House is 0.38 acre. The Upland Pine vegetation community dominates both of these sites. Vegetation would be cleared from the site and chipped.

All of the following ground disturbing activities would occur within the cleared of vegetation area (0.76 acre).

Ground disturbing activities would include installation of wood pilings to support the relocated structures and installation of hook-ups to the existing utilities at the relocation site. An underground water line, electrical, cable, and phone lines exists on-site and would be tapped into to provide for services to the USCG Station and the USLS Station. A minor realignment of the existing water line would be necessary to facilitate the installation of pilings to support the USLS Station. The water line would be rerouted to the north of the USLS Station. The site does not currently have septic drain field or sewer system service. A mound septic system would be established for each of the buildings and sized accordingly. A 3,750 sq. ft. mound septic system would be installed for the USLS Station, and a 5,000 sq. ft. mound septic system would be installed for the USCG Station. In total, the mound systems would occupy 0.26 acre.

Parking and driving surfaces would be established using porous pavers (e.g., TurfStone®). In total 0.14 acre would be prepared with porous pavers to establish parking and driving surfaces at the relocation site. ADA-compliant walkways connecting the parking areas to the buildings would be constructed using pervious materials.

A sign would be installed to direct visitors past the relocated Complex to the Bodie Island Lighthouse/Visitor Center.

The use of the structures for park operations would be restored as soon as reasonably possible.

Staging Area

Potential staging areas are available as needed for the temporary staging of materials and parking of construction vehicles. The existing paved parking area at the US Coast Guard Station (23,760 sq. ft.) would be used as the primary staging area. If necessary, additional staging areas to be considered are at Coquina Beach parking area, the “bone yard” located near the Bodie Island Lighthouse, and the Bodie Island Maintenance Area.

Mitigation Measures

Construction zones would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

Temporary impacts associated with building relocation activities would occur, such as soil and vegetation disturbance and the possibility of soil erosion. In an effort to avoid introduction of exotic plant species, no hay bales would be used. Hay often contains seed of undesirable or harmful alien plant species. Therefore, on a case-by-case basis the following materials would be used for any erosion control dams that would be necessary: rice straw, straws determined by NPS to be weed-free, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales. Standard erosion control measures such as silt fences and/or sand bags would also be used to minimize any potential soil erosion. Silt fencing would be installed around the mound septic systems and maintained for one year or until the site was adequately vegetated to hold the soils in place.

Silt fencing fabric would be inspected weekly or after every major storm. Accumulated sediments would be removed when the fabric is estimated to be approximately 75 percent full. Silt removal would be accomplished in such a way as to avoid introduction into any wetlands or flowing water bodies.

Although soil side-cast during construction would be susceptible to some erosion, such erosion would be minimized by placing silt fencing around the excavated soil. Excavated soil would be used in the construction project; excess soil would be stored in approved areas.

In many areas soils and vegetation are already impacted to a degree by various human and natural activities. Construction would take advantage of these previously disturbed areas wherever possible. Soils within the project construction limits would be compacted and trampled by the presence of construction equipment and workers. Soils would be susceptible to erosion until revegetation takes place. Vegetation impacts and potential compaction and erosion of bare soils would be minimized by conserving topsoil in windrows. The use of conserved topsoil would help preserve micro-organisms and seeds of native plants. The topsoil would be respread in as near as original location as possible, and supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area. This would reduce construction scars and erosion.

Some petrochemicals from construction equipment would seep into the soil. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.

Should construction unearth previously undiscovered archeological resources, work would be stopped in the area of any discovery and the Seashore would consult with the state historic preservation officer/tribal historic preservation officer and the Advisory Council on Historic Preservation (ACHP), as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

The NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment traffic would be minimized in the area of the site. Equipment and materials staging areas would also avoid known archeological resources.

The flow of vehicle traffic on the road would be maintained as much as possible during the construction period. Construction delays would normally be limited to 30 minutes. There would be some periods when the nature of the construction work would require temporary road closures. All efforts would be made to reduce these as much as possible and to alert park staff as soon as possible if delays longer than normal are expected. Visitors would be informed of construction activities and associated delays. Traffic would be managed to ensure timely access to private residents and ranches along the road.

Contractors would coordinate with park staff to reduce disruption in normal park activities. Equipment would not be stored along the roadway overnight without prior approval of park staff. Construction workers and supervisors would be informed about the special sensitivity of park values, regulations, an appropriate housekeeping.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Environmentally Preferred Alternative is defined by CEQ as “the alternative that will promote the national environmental policy as expressed in NEPA [Section 101 (b)].” Section 101 (b) goes on to define the Environmentally Preferred Alternative through the application of six criteria, listed below. Generally, these criteria define the Environmentally Preferred Alternative as the alternative that causes the least

amount of damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources, while attaining the widest range of beneficial uses of the environment. Each criterion is presented below, followed by a discussion of how well the alternatives meet each one.

1. **Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.** The goal of the NPS at all units is to serve as a trustee of the environment for future generations. Under Alternative A, the NPS would continue to have difficulty fulfilling this role, since the historic structures would continue to be threatened by the encroaching Atlantic Ocean and the dune would continue to be mechanically rebuilt as needed. Under Alternative B, the historic structures would be relocated to a site where modification of geologic resources is not necessary and the footprint of the buildings on the environment is reduced by elevating the structures on pilings.

2. **Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.** Under Alternative A, the project site would become increasingly unsafe and unattractive, as conditions continued to deteriorate. Loose structural elements would potentially create an unsafe condition for park visitors or park operations. Under Alternative B, the structures would be relocated and secured on wood pilings to facilitate future restoration efforts.

3. **Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.** Health and safety risks, as well as other undesirable and unintended consequences, were addressed during the development of both alternatives described in this EA to avoid and minimize potential impacts to the extent possible. Under Alternative A, protection of the historic structures would include continued repair and maintenance of a dune. Under Alternative B, the historic structures would be relocated to a site where continued dune repair and maintenance activities would not be required to protect the structures.

4. **Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.** Under Alternative A, historic resources would continue to deteriorate and potentially be abandoned if deemed unsafe to the Bodie Island District Law Enforcement operation to continue using the structures. Alternative B allows for the preservation of these historic resources through relocation in preparation for future restoration. This alternative also emphasizes the use of the buildings in a manner consistent with their historical use.

5. **Achieve a balance between population and resource use that will permit high standards of living and wide sharing of life's amenities.** Under Alternative A, the three historic structures would continue to deteriorate, and potentially become unusable for park operations. Under Alternative B, these historic structures would be relocated to allow for their continued use for park operations and future rehabilitation in a way that is not consumptive.

6. **Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.** Alternative A does not contribute to this criterion. Under Alternative B, relocation of the historic structures allows for planning using best management practices for sustainable design, construction, and operation.

Alternative B best meets the criteria for the Environmentally Preferred Alternative. Alternative B also was identified as the NPS Preferred Alternative.

ALTERNATIVES CONSIDERED BUT DISMISSED

In addition to the relocation site described under Alternative A, five other sites on Bodie Island were proposed and analyzed for their potential to fulfill the objectives of this project (Figure 7). For each site, a general description of the setting and reasons for dismissal are described below. The reasons for dismissal relate to the project objectives of minimization of the threat of loss to the Atlantic Ocean; distance from the original construction sites; and impacts on natural and cultural resources, as well as park operations, and visitor experience.

Whalebone Junction Intersection

The intersection of three highways (NC 12, US 64, and US 158) and South Nags Head Road on Bodie Island is commonly referred to as "Whalebone Junction" (Figure 7). The north entrance to Cape Hatteras National Seashore is located at this intersection. At this intersection, NC 12 continues south and is the primary route of travel through the Seashore. The Whalebone Junction Intersection is located in the 100-year floodplain and approximately 5.1 miles north of the site currently occupied by the Complex.

West Side

The Seashore's GMP (1984) identified a "major gap in visitor services" at the Whalebone Junction park entrance because the visitor contact kiosk offered little in the way of seashore information and orientation to visitors because of its limited space at that time. To remedy this deficiency, the GMP identified that relocation of the USCG Station would be a suitable replacement for the existing kiosk.

A proposed development plan for the site (Figure 8) documents the proposal to relocate the USCG Station, Life-Saving Station, and Boat House and included in an unpublished report titled

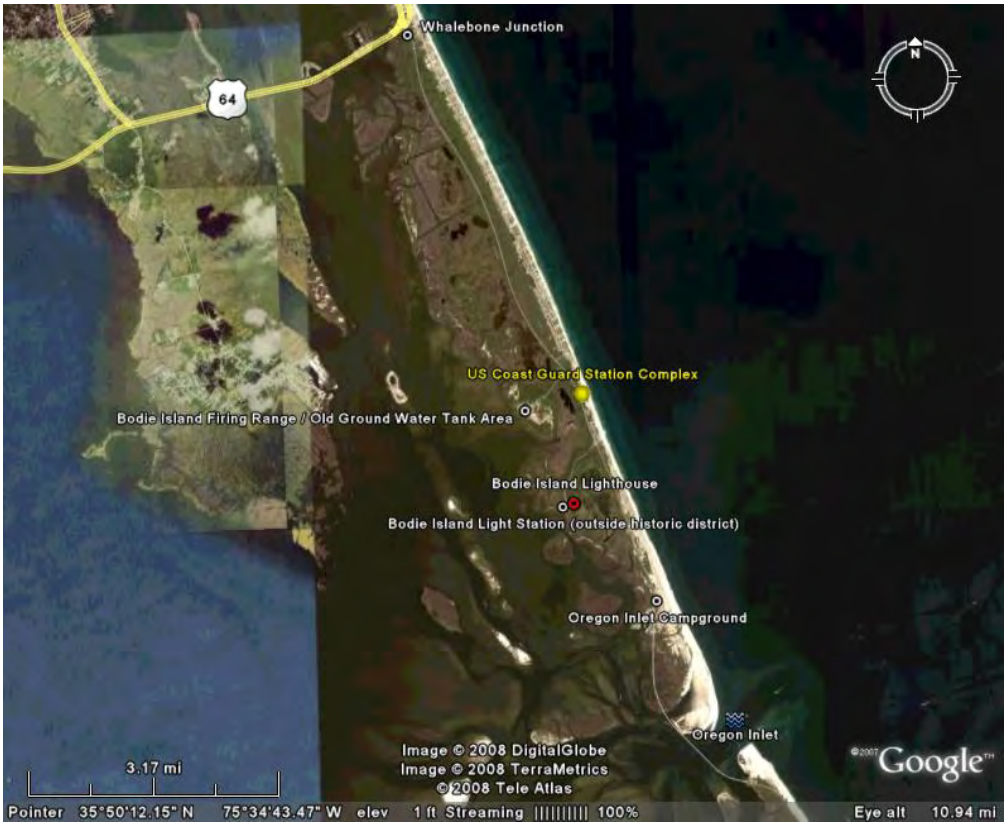

Figure 7. Relocation sites considered but dismissed. (GoogleEarth 2008)

"The Bodie Island Master Plan: A Site Analysis and Design Proposal for Visitor and Park Facilities" (Heiser 1987). This plan shows that the "Whalebone Junction Visitor Center Complex" would be comprised of the USCG Station, USLS Station, Boat House, and parking areas projected to provide 80 vehicle and 15 RV parking spaces. A one-way road would be constructed to direct visitors to the parking area and provide a route for exiting the complex. This one-way road would abut estuarine marshes.

The "woefully inadequate" Whalebone Junction kiosk located at this site in 1984 was subsequently replaced by the Whalebone Junction Information Station. Currently, visitors have the opportunity to park their vehicles at a small parking lot and visit the Seashore's Whalebone Junction Information Station which serves as an Outer Banks Visitors Bureau welcome facility under a NPS agreement with the Dare County Tourism Board. Public restrooms are located in a separate building, opposite the Information Station. The existing, paved parking lot is striped for 13 vehicles, and visitors exiting the parking area are routed directly on NC 12, heading either north or south. The visitor services at Whalebone Junction have improved substantially since 1984, and these services continue to be modestly upgraded within the existing facility and developed zone.

The shoreline erosion rate in this vicinity is 1.6 feet/year, and the site would be located in the 100-year floodplain. If the three historic structures were to be relocated to this site as shown in Figure 8, the existing parking area would be inadequate to support visitation to the structures. Increasing parking area and any realignment of roads serving the site would result in direct, adverse impact to and loss of NPS, USACE, and North Carolina coastal wetlands. A Section 404 permit application to the USACE would be required to allow the clearing and filling of these wetlands, and mitigation for adverse impacts would also be required. The NPS would also need to demonstrate that this site was the only viable site and that avoidance of wetland impacts was not possible through consideration of alternative sites. This EA documents that relocation of the three historic structures to the site described under Alternative B would allow for the avoidance of wetland impacts.

Relocating the buildings to the Whalebone Junction area to use them for purposes other than emergency response services would be inconsistent with their historic uses. Additionally, the NPS could not continue to use any of the structures as the Bodie Island District Office and an alternate office site for the NPS law enforcement operations on Bodie Island would have to be identified. No such alternate site for the Bodie Island District Office on Bodie Island is available for this long-term use.

For these reasons, relocation of the Complex to the west side of the Whalebone Junction intersection was considered but dismissed from further analysis.

East Side

An alternate site was proposed near Whalebone Junction Information Station. This site is located immediately across NC 12 from the existing Whalebone Junction Information Station. The site was previously disturbed by the US Army and is currently densely vegetated with an even-aged stand of pine trees, shrub thicket, and wetlands.

The shoreline erosion rate in this vicinity is 1.6 feet/year, and the site would be located in the 100-year floodplain. Relocation of the three historic structures to this site would substantially alter the visual landscape. The three historic structures, the Whalebone Junction Information Station, and Whalebone Junction traffic would become highly visible to occupants of the nearby housing in South Nags Head. Placement of the structures in this context would not allow for the maintenance of the historic setting in which these structures were originally constructed.

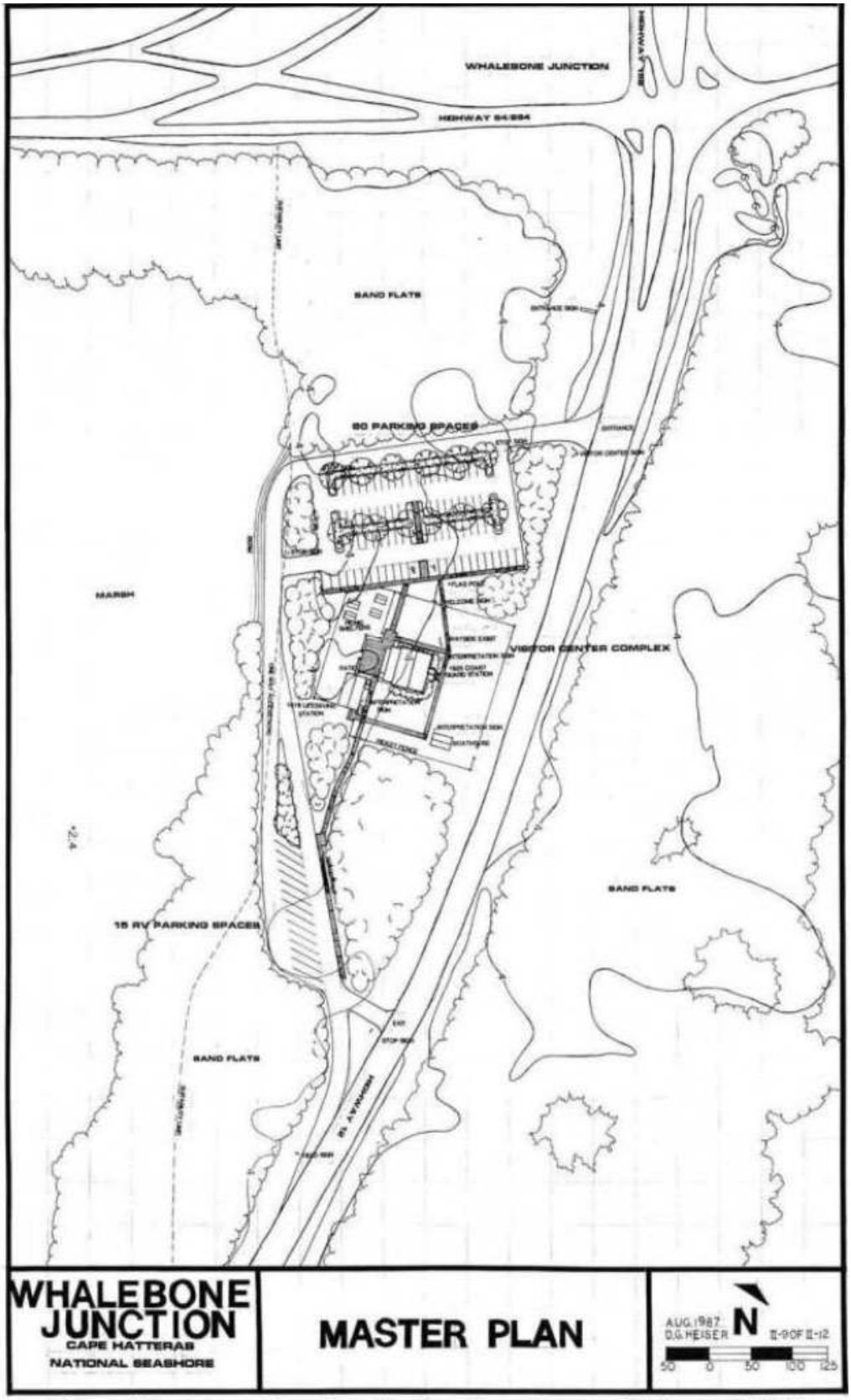

Figure 8. Proposed site development plan to relocate the Complex to the Whalebone Junction site. (Heiser 1987 *in* Oppermann 2005b)

There are no existing utilities to support the intended use of the structures for park operations, and utility hookup would require disturbance of the NC 12 highway corridor to allow access to the nearby utility lines servicing the Whalebone Junction Information Station. Additionally, placement of the buildings at this site would result in a longer drive time for Law Enforcement officers responding to emergencies in the Bodie Island District.

For these reasons, this alternative was considered but dismissed.

Bodie Island Firing Range / Old Ground Water Tank Area

Relocation of the structures to a previously disturbed site near the existing Bodie Island firing range and an old ground water tank was proposed. The site is located approximately 0.4 miles north and 0.7 miles west of the current site of the Complex. An unnamed, gated, unimproved access road provides access to the site from NC 12. The Navy transmissions tower and operations building, as well as the NPS firing range, are located near the terminus of this access road. The site is isolated and subject to vandalism. The site is also located in the 100-year floodplain and is subject to sound-side flooding.

The site does not currently have any utility services (e.g., water, electric, phone, septic) and would require archeology for each corridor of the land disturbance. A water supply from Nags Head for fire suppression systems would be needed. The existing water tank would be razed and removed. In preparation for relocation of the structures to this site, the existing access road would need to be widened by clearing vegetation and potentially improving the road surface. Road widening (0.42 miles x 50 feet additional width) would require the filling of at least 2.5 acres of wetlands. Installation of utility lines would result in an unknown acreage of direct, adverse impacts to wetlands. A Section 404 permit application to the USACE would be required to impact wetland, and mitigation would be required. The NPS would also need to demonstrate that this site was the only viable site for relocating the three historic structures and that avoidance of wetland impacts was not possible through consideration of alternative sites. This EA documents that relocation of the three historic structures to the site described under Alternative B would allow for the avoidance of wetland impacts.

Relocating the structures to this site would allow the structures to be transported the fastest, shortest distance, and also minimize traffic disruption on NC 12 while the structures were being moved. However, relocating the structures to this site would result in diminishment of the Complex's historic relationship to the Ocean and result in an adverse effect on the National Register status. Relocating the structures to this site would place them closer to the Roanoke Sound than the Atlantic Ocean.

This site would also place the relocated structures in the immediate vicinity of the shooting range and conflict with the intended quiet and safe uses the structures for park operations. Relocation of the structures to this site would also result in increased traffic on the unnamed access road.

For these reasons, this alternative was considered but dismissed.

Bodie Island Light Station (Outside the Historic District)

Relocation of the structures to an area near the Bodie Island Lighthouse was proposed. However, this alternative was considered but dismissed due to the adverse effects on the cultural landscape and viewsheds associated with the Bodie Island Lighthouse Historic District, diminishment of the Complex's historic relationship to the Ocean, the prevalence of wetlands at this site, and unavailability of sufficient upland acreage to allow the relocation of the structures to this site in their historic configuration.

Oregon Inlet Campground

Relocation of the structures to an area within the Oregon Inlet Campground was proposed. However, relocating the structures to the Campground does not reduce the threat of loss associated with beach erosion and threat of dune deterioration. Placement and use of the structures for the Bodie Island District Law Enforcement office would conflict with traffic, circulation, and visitor use of the Campground. Therefore, this alternative was considered but dismissed.

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CHAPTER 3: AFFECTED ENVIRONMENT

Stretched over 70 miles of barrier islands in eastern North Carolina, Cape Hatteras National Seashore encompasses 31,292 acres. The Park lies within the coastal physiographic province, is home to a variety of natural and cultural resources, and provides a wide variety of recreational opportunities. Once dubbed the "Graveyard of the Atlantic" for its treacherous currents, shoals, and storms, Cape Hatteras has a wealth of history relating to shipwrecks, lighthouses, and government operations. These dynamic islands provide a variety of habitats and are a valuable wintering area for migrating waterfowl. The Seashore's fishing and surfing are considered the best on the east coast.

This chapter describes the existing environmental conditions in and around the site. Organized by resource topic, this chapter describes the resources that potentially would be impacted by the proposed action. Resources examined in detail include cultural resources (historic structures and districts); natural resources (geologic resources, soils, floodplains, vegetation, fire fuels, wildlife and wildlife habitat); lightscapes; and park operations.

CULTURAL RESOURCES

Historic Structures

The significant cultural resources of Cape Hatteras National Seashore consist mainly of the lighthouses and the remaining vestiges of the USLS Service and USCG facilities. The NPS preserves and protects a unique collection of USLS and USCG Stations at Cape Hatteras National Seashore. The collection is unique because it contains at least one representative structure from each of the four USLS Service construction periods (1874; 1878; 1880-1888; and 1894-1905).

The Bodie Island U.S. Coast Guard Station Complex is comprised of three separate but related structures, each of which is on the NPS List of Classified Structures (LCS):

- 1879 USLS Station (LCS# HS-1B),
- 1916 Boat House (LCS# HS-1D), and
- 1925 USCG Station (LCS# HS-1A).

The 1879 USLS Station (LCS# HS-1B) at Bodie Island represents the 1876 Carpenter Gothic architectural style, was constructed in 1878, commissioned and occupied in 1879, and is the only one of its particular pattern surviving in North Carolina. This Station, along with the 1874 structures of this style, were originally constructed between 1874 and 1879 all along the Atlantic coast at approximately every five to seven miles along the Ocean (Figure 9). The site upon which the USLS Station was constructed was known as Tommy's Hummock, located approximately three miles north of Oregon Inlet. The station was originally known as the Tommy's Hummock Life-Saving Station, and it filled a critical gap between the 1874 Nags Head Station to the north and the 1874 Oregon Inlet Station. It was later renamed the Bodie Island Life-Saving Station. Sometime before 1904 a boat house was constructed, but it was replaced by a new boat house in 1916 (LCS# HS-1D).

Originally these structures were used by the USLS Service. In 1915 the Service was combined with the Revenue Cutter Service to form the U.S. Coast Guard, who occupied the station until 1925. In 1925 a new station was constructed for the staff (LCS# HS-1A). The 1879 USLS Station was used as a storage building for the life saving boats operating out of the station. During World War II, it was used as a galley and mess hall.

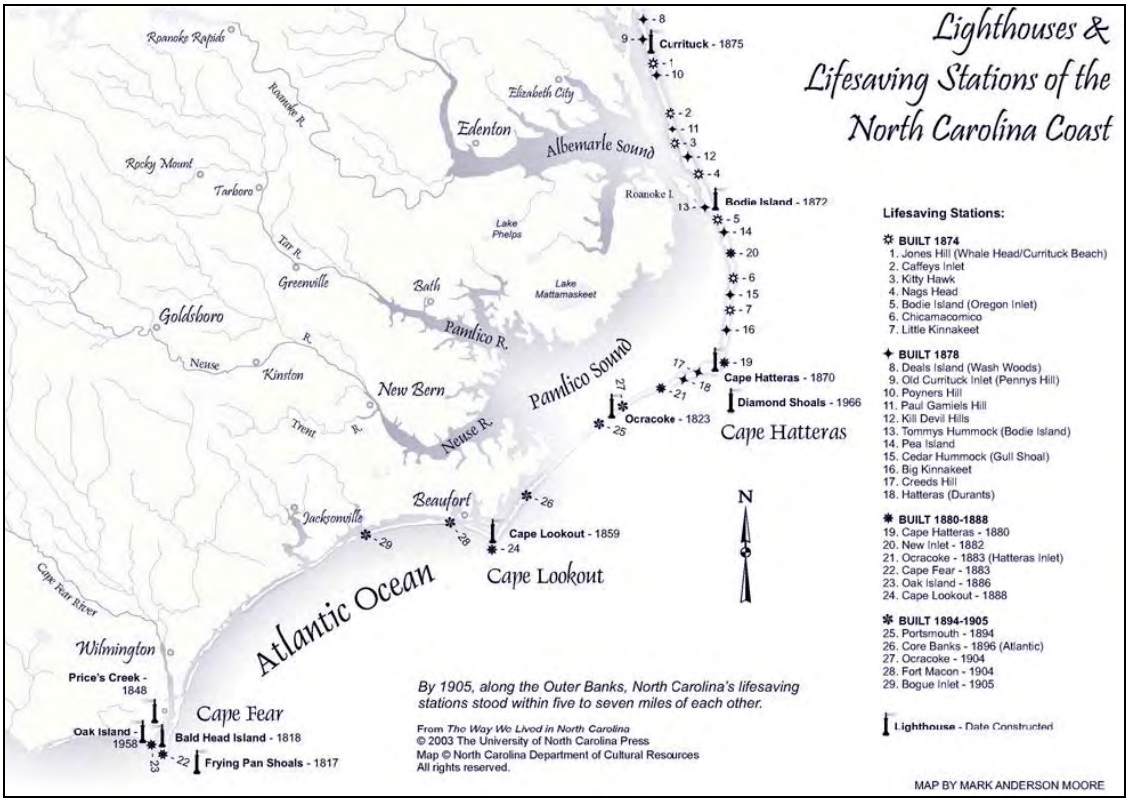

Figure 9. Lighthouses and Life-Saving Stations of the North Carolina Coast (in Oppermann 2005a).

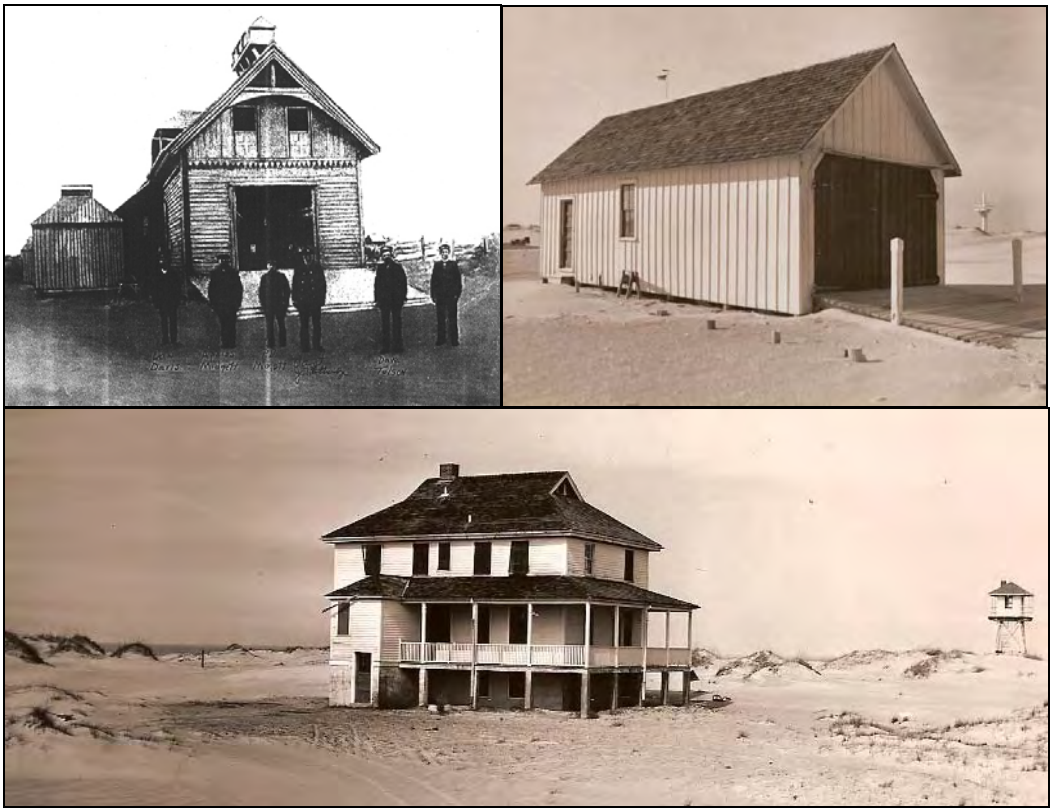

Figure 10. Photographs of the 1879 USLS Station as it was pre-1900 (top left), 1916 Boat House as it was in 1955 (top right), and 1925 USCG Station as it was in 1955 (bottom).

Figure 11. Aerial photograph (July 14, 1944) of the original configuration of 1879 USLS Station, 1916 Boat House, and 1925 USCG Station. The Bodie Island Lighthouse is visible in the distance, southwest of the Complex.

The 1925 Coast Guard Station was severely damaged by a hurricane in 1933 and reconstructed on the site of its original construction.

In 1955 the NPS relocated the USLS Station and Boat House from their original locations to their current locations because they were threatened by beach erosion (Figure 12). Although the structures' original north-south orientation was retained, the distance between the USLS Station and Boat House was substantially reduced and the Boat House was rotated to face inland. Water tanks at the original site were not relocated. Various modifications were made to the structures including the removal of chimneys, replacement of doors and windows, and interior wall removals and constructed partitions.

Shortly after this relocation, the USLS Station became headquarters for NPS staff working at Cape Hatteras National Seashore and was the NPS operations center for over a decade. It was then used as one of two cottages for volunteers in the Seashore for many years. In the early 1990's it served as family housing for the Seashore's Superintendent. Today it serves as the NPS' Bodie Island District office for law enforcement officers and beach lifeguards.

Figure 12. Relocation of the USLS Station in progress during 1955.

Figure 13. Aerial photograph (2008) showing the original, current, and proposed locations of the 1879 USLS Station, 1916 Boat House, and 1925 USCG Station. (Google Earth 2008)

The Complex represents the operations and architecture of the USLS Service and the Coast Guard on the Outer Banks of North Carolina. The Complex was formally added to the National Register of Historic Places on February 9, 1979 as a Historic District with local significance, qualifying under the National Register Criteria A and C (36 CFR 60):

> A: association with events that have made a significant contribution to the broad patterns of our history;
>
> C: embodiment of the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components would lack individual distinction.

In 2006, stabilization of these structures began to prevent further deterioration (NPS 2006b and 2007). As of 2007, all structural components of the USLS Station, Boat House, and USCG Station have been stabilized.

The USLS Station has five rooms and two restrooms. The existing septic system (720 sq. ft.) is in good, working condition. This structure is also equipped with telephone, cable, and water services. The Boat House has electrical service only. The USCG Station has 20 rooms and four restrooms. The existing septic system (1400 sq. ft.) is in good, working condition. This structure is also equipped with telephone, cable, and water services.

NATURAL RESOURCES

Geologic Resources

The project area is located in the coastal plain geologic formation and is comprised of beach sand deposited during the Holocene Epoch (10,000 years ago to the present) (Fullerton et al. 2003). According to Riggs et al. (*in preparation*), Bodie Island is a complex barrier island which is:

> …high and wide… due to major inputs of 'new' sediment onto the barriers at various times in their evolutionary history...generally characterized by a young overwash-dominated component that has migrated into and welded onto an older barrier island segment composed of beach ridges and dune fields on the mid- and back-sections of the island. Due to the large volume of sand, normal storm surges have little potential for opening new inlets through complex islands and Oceanic overwash only occurs along the modern, front side of the barrier. Thus, salt spray is minimal allowing extensive maritime forests to develop on the mid- and back sections of the complex barrier islands.

A coastal risk assessment modeling of physical processes influencing Cape Hatteras National Seashore identified that the Complex was the Seashore's cultural resource site at the greatest risk of loss due to the combined threats of shoreline retreat, inlet formation, and overwash (Buie 1996).

The average erosion rate, as of 2004, in the project area ranges from 8.7 to 10.2 feet per year with increasing erosion rates in the southern portion of the project area (Figure 14, NCDCM 2008). The setback factor is 8.5 at for the site currently occupied by the structures and 10 at Coquina Beach, east of the relocation site.

Daily winds are eroding the dune field and causing it to recede to the west. Also, high-energy weather events result in dune breakage at least once every three years. The Thanksgiving Day storm in 2006 resulted in dune breakage east of the Complex and at Coquina Beach, and the dune has since been repaired by rebuilding the dune and installation of sand fencing (Figure 4). Dune repair to protect these three historic structures is consistent with NPS Management Policies (2006) regarding geologic resources and processes. Repair and maintenance of dunes within Cape Hatteras National Seashore was previously determined to be consistent with the State's coastal management program under a federal consistency concurrence, "CD07-015 - Consistency Concurrence for Proposed Maintenance and Repair of Access Ramps and Dunes, on an as Needed Basis, for a Period of Three Years, Dare County, North Carolina (DCM#20070017)," issued on April 13, 2007 by the Division of Coastal Management.

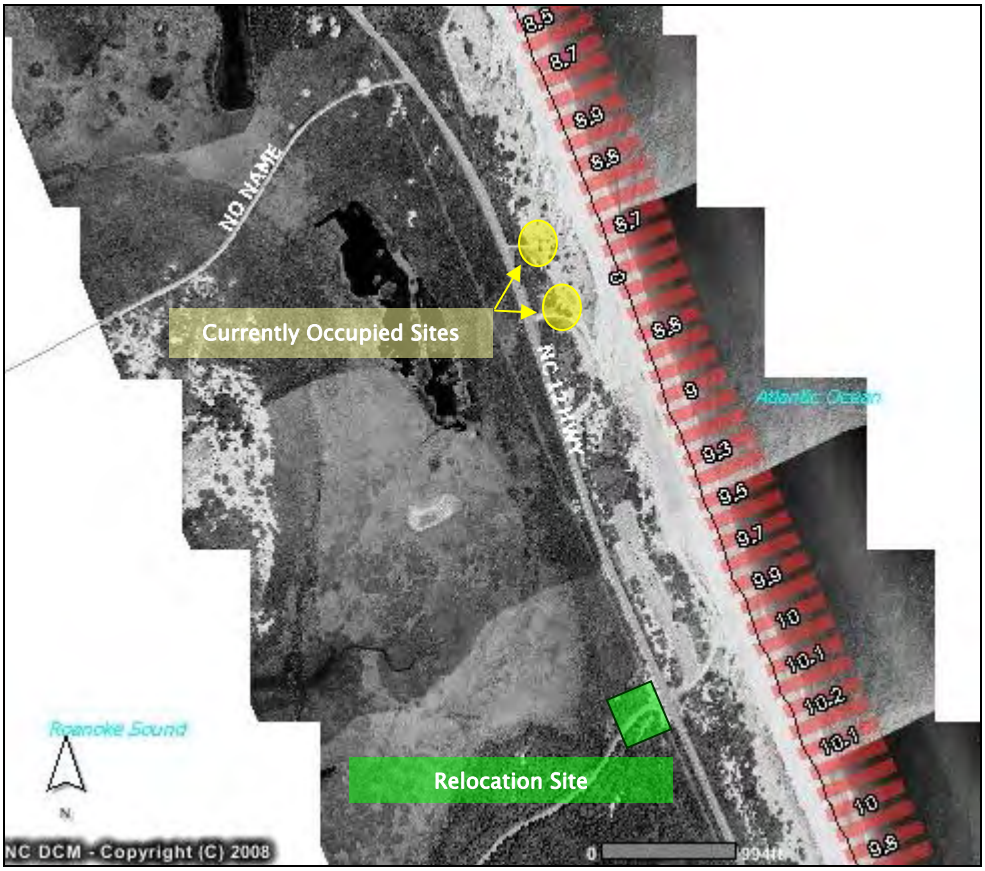

Figure 14. Average erosion rates (ft/yr) in the project area on Bodie Island. (NCDCM 2008)

Soils

According to the Natural Resources Conservation Service (NRCS 2008), four sandy soil types are present in the project area: Beaches-Newhan complex (BnD), Newhan fine sand (NeC), Duckston fine sand (DtA), and Corolla-Duckston complex (CrB). Each is described in detail below, followed by a brief account on soil types which may be impacted by the proposed action.

Soil Type Descriptions

The Beaches-Newhan complex (BnD) soil type is a mixture, typically composed of Beaches (45 percent) and Newhan and similar sands (45 percent). The Corolla-Duckston complex (CrB) soil type is a mixture,

typically composed of Corolla (at least 50 percent), Duckston (at least 30 percent), and similar soils. Each of the four component soil types is described separately below.

The Beaches soil is typically found on barrier island beaches and flats with 0 to 5 percent slope. It is characterized as being poorly drained, frequently flooding, deep sand with depth to water at 6 inches.

The Newhan fine sand (NeC) soil type is typically found on the backs and sides of 0 to 10 percent slope. The grain size profile is characterized by fine sands 0 to 50 inches depth and sands from 50 to 80 inches depth. This soil type is excessively drained, rarely flooding and never ponding. The water table is typically at a depth greater than 80 inches.

The Duckston fine sand (DtA) soil type is typically found in depressions with 0 to 2 percent slope. The grain size profile is characterized by fine sands at 0 to 8 inches depth and sands at 8 to 80 inches depth. This soil type is poorly drained and occasionally floods, but never ponds. The water table is typically within the top 6 inches.

The Corolla soils are typically found on at the bases of slopes and depressions with 0 to 6 percent slope. The grain size profile is characterized by fine sands at 0-26 inches depth and sands at 26 to 80 inches depth. This soil type is moderately well-drained, rarely floods, and never ponds. The water table table is typically at 18 to 36 inches depth.

All of these soils and complexes have "very limited" utility as septic tank absorption fields. Therefore, septic mound systems are necessary.

Current Site

Three different soil types are located at the current location of the Complex. The flat beach areas that are frequently inundated by the Ocean waters are composed of Beach-Newhan complex (BnD) soils. The dune system, current location of the structures, and the eastern portion of access roads associated with these structures are currently located on a wide stretch of Newhan fine sand (NeC). The western portion of the access roads and NC 12 are underlain by a wide stretch of Duckston fine sand (DtA).

Relocation Site

Three different soils types are located at the relocation site. The Newhand fine sand (NeC) soil type associated with the Upland Pine and Upland Scrub/Shrub vegetation communities at the relocation site. The Corolla-Duckston complex (CrB) soil type is associated with the Upland Scrub/Shrub and Wetland Scrub/Shrub vegetation communities at the relocation site. The Duckston fine sands (DtA) soil type is associated with the Wetland Scrub/Shrub vegetation community of the relocation site.

Once relocated, the structures, access roads, and support facilities (e.g., septic tank and other buried utilities) would be located on Newhan fine sand (NeC). Soils of the nearby Corolla-Duckston complex (CrB) would be impacted during the site-preparation activities, installation of mitigation measures (e.g., silt fencing), during the relocation of the structures and support facilities (e.g., septic mound system), and the long-term functioning of a permanent septic system. The Duckston fine sands (DtA) are located in the northern and southernmost portions of the relocation site, and no development is proposed on this soil type.

Floodplains

A land survey was conducted in December 2006. Elevations in the immediate vicinity of the project area range from 1 to 7 feet above sea level. Federal Emergency Management Agency (FEMA) Flood

Insurance Rate Maps show that the project area is within 100-year-flood floodplain (Figure 15 and Figures C2-C4 in Appendix C: Statement of Findings for Floodplains). Due to the low topography, the entire project area on Bodie Island is located within the 100-year flood zone, is subject to inundation during extreme storm events, and where base flood elevations range between 10 and 11 feet. The site currently occupied by the structures is located within the velocity zone, while the relocation site is not located within the velocity zone.

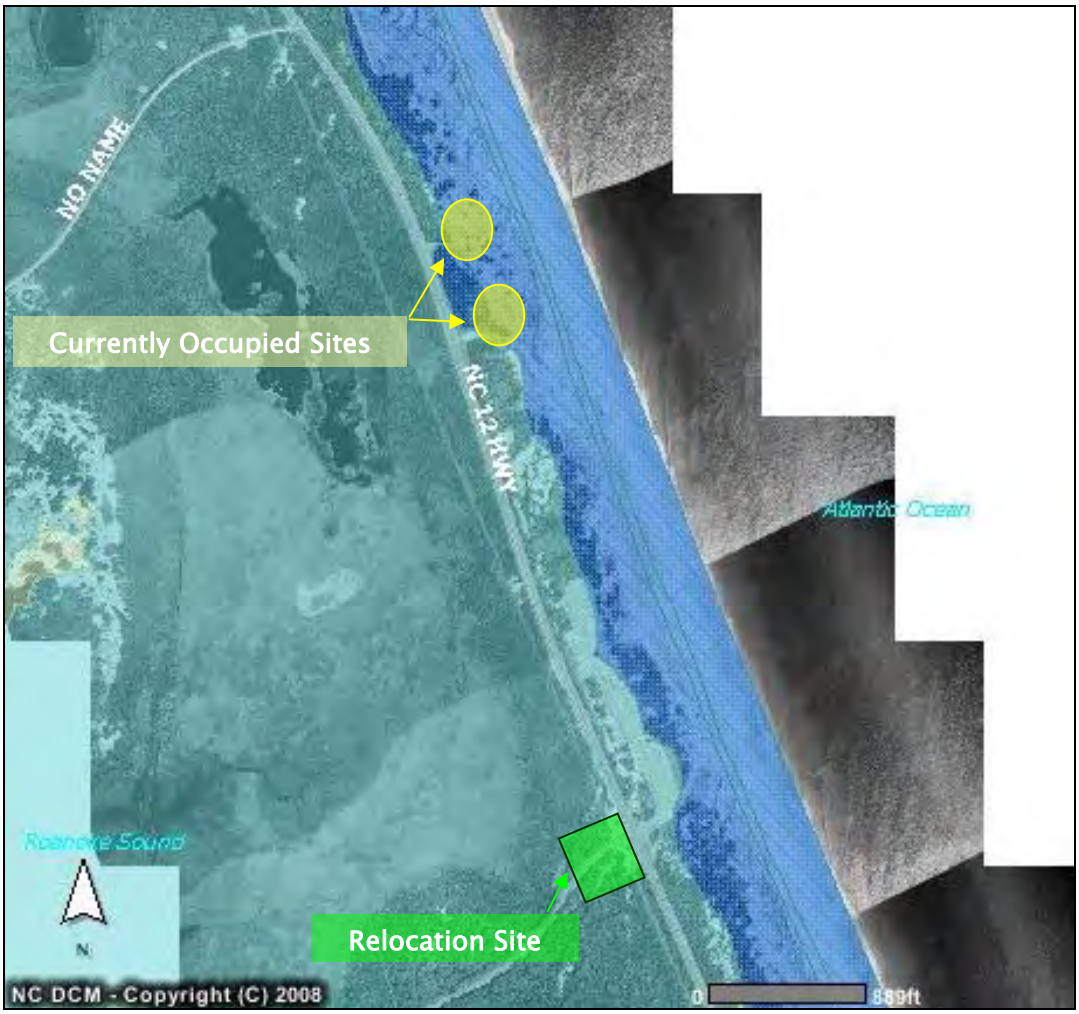

Figure 15. FEMA flood map for the project area. The 100-year floodplain (AE) is shown in light blue, and the "velocity zone" is shown in dark blue. (NCDCM 2008)

Vegetation

Current Site

Vegetation present at the current site of the Complex is typical of the backslopes of dunes along the neighboring barrier islands. Since the site is subject to frequent overwash and blowing sand, vegetation is sparse. Scattered clumps of dune grasses are common atop sections of dune that have not recently blown-out. Commonly encountered species include sea oats (*Uniola paniculata*) and American searocket (*Cakile edentula*). The area surrounding the structures is vegetated with lawn grasses and scattered dune vegetation, including Bahia grass (*Paspalum notatum*), saltmeadow cordgrass (*Spartina patens*), cockspur pricklypear (*Opuntia pusilla*), prickly pear cactus (*Opuntia humifusa*), largeleaf pennywort (*Hydrocotyle*

bonariensis), firewheel (*Gaillardia pulchella*), mound lily yucca (*Yucca gloriosa*), and Carolina fimbry (*Fimbristylis caroliniana*). The nearby shrub thicket is dominated by two shrub species (yaupon [*Ilex vomitoria*] and eastern red cedar [*Juniperus virginiana*]), with an occasional wild black cherry tree (*Prunus serotina*) and thick greenbrier (*Smilax bona-nox*) and Virginia creeper (*Parthenocissus quinquefolia*).

Relocation Site

Four different vegetation communities are present at the relocation site, of which two were upland and two were wetland types. Radiating north and south from the Bodie Island Lighthouse Road, the order of vegetation communities are as follows: Upland Pine to Upland Scrub/Shrub to Wetland Scrub/Shrub to Tidal Marsh (Figure 16; Hartrampf and Quible & Associates, P.C. 2008).

The Upland Pine vegetation community is present on areas with the highest elevation immediately north and south of the Bodie Island Lighthouse Road within the project site. This community is characterized by its mature, overstory canopy dominance by loblolly pine (*Pinus taeda*); a shrub and herb layers are dominated by shade-tolerant species such as wax myrtle (*Morella cerifera*), yaupon (*Ilex vomitoria*), fox grape (*Vitis labrusca*), poison ivy (*Toxicodendron radicans*), and chokecherry (*Prunus virginiana*). The herb layer is characterized by broomsedge (*Andropogon virginicus*) and flat-topped goldenrod (*Euthamia tenuifolia*) in areas receiving more sunlight due to canopy openings. The ground surface is covered by a substantial volume of downed trees, detritus, and pine straw. No appreciable organic material is observed in the near-surface soils.

The Upland Scrub/Shrub vegetation community is located between the Upland Pine and Wetland Scrub/Shrub communities. Upland Scrub/Shrub is also present near the telephone pole corridor in the eastern portion of the relocation site. The Upland Scrub/Shrub community is characterized by having very few loblolly pine trees in the overstory and a dense shrub layer dominated by wax myrtle, bayberry (*Morella pensylvanica*), redbay (*Persea borbonia*), and yaupon. Areas devoid of dense shrubs within this vegetation community are characterized by a dense herb layer of broomsedge, hairy fleabane (*Conyza bonariensis*), shortbristle horned beaksedge (*Rhynchospora corniculata*), and seaside goldenrod (*Solidago sempervirens*). Vegetation in the areas near the overhead power transmission lines appears to be periodically cut, exposing the sand mixed with a thin accumulation of dry organic material.

The Wetland Scrub/Shrub vegetation community is located between the Upland Scrub/Shrub and Tidal Marsh communities. The Wetland Scrub/Shrub community is characterized by an absence of loblolly pine trees in the overstory and a dense shrub layer dominated by shrub species present in the Upland Scrub/Shrub community plus other species that are more hydrophytic, such as silvering (*Baccharis halimifolia*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), common threesquare (*Schoenoplectus pungens*), and saw-grass (*Cladium jamaicense*). It is lower in elevation than the Upland Scrub/Shrub area, and there is some evidence of occasional standing water from a high water table or ponding as evidenced by stained leaves, decomposed detritus, and a hydric organic layer on the soil surface. Using the Cowardin System, this vegetation community is best described as an estuarine, inter-tidal [irregularly flooded], shrub-shrub, broad-leaved deciduous wetland.

A small area of Tidal Marsh is present in the extreme northwest corner of the relocation site. This community has the lowest elevation within the project area and has a surface hydrologic connection with the open waters of the Roanoke Sound. This community is dominated by herbaceous hydrophytic vegetation and is subject to occasional tidal inundation. Species diversity is low and includes only salt-tolerant plants, such as silvering, saw-grass, black needle-rush (*Juncus roemerianus*), seashore mallow (*Kosteletzkya virginica*), common threesquare, and cattail (*Typha latifolia*). Using the Cowardin System, this vegetation community is best described as an estuarine, inter-tidal [irregularly flooded], emergent wetland.

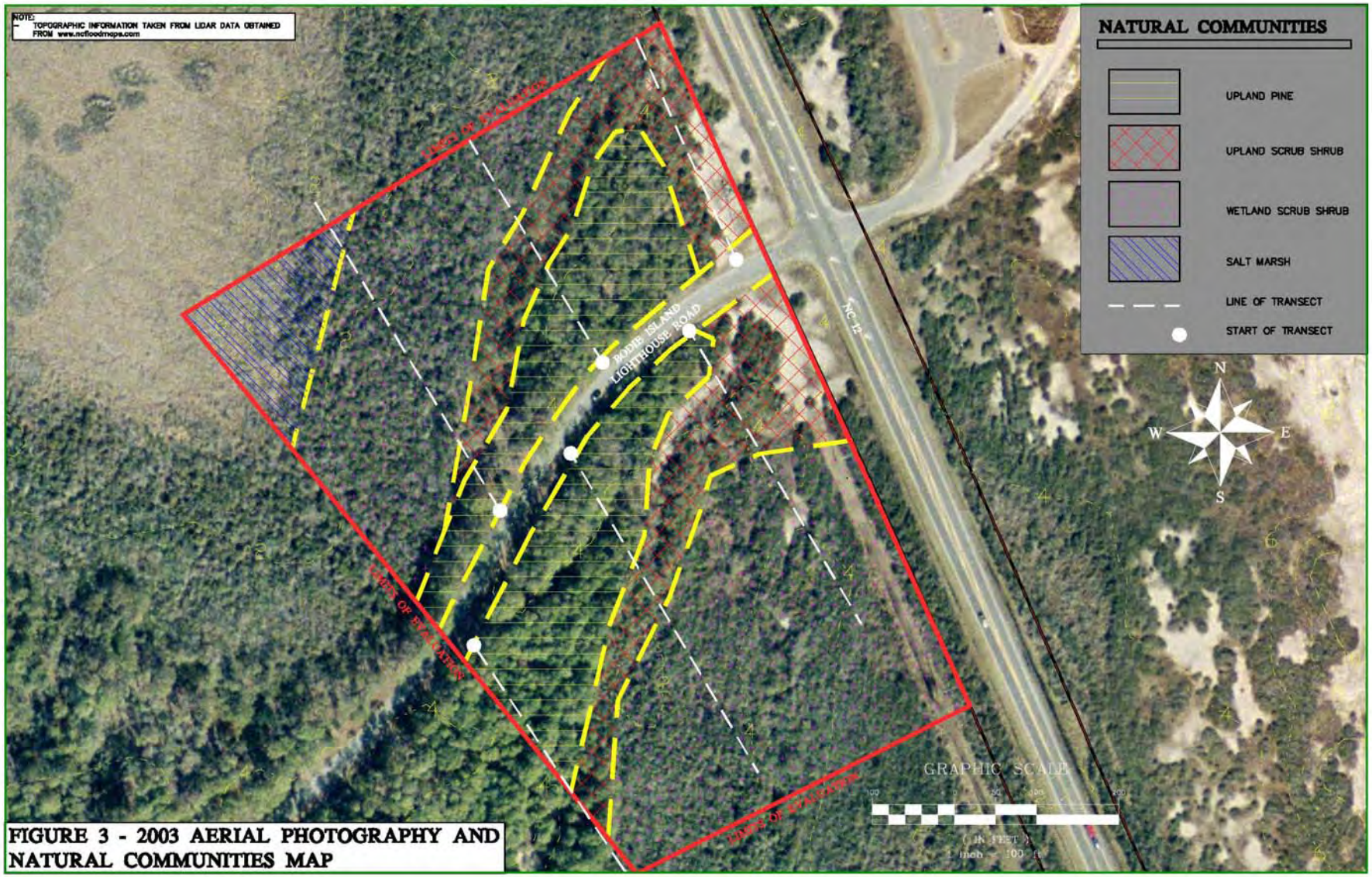

Figure 16. Vegetation present at the relocation site. (Hartrampf and Quible & Associates, P.C. 2008)

Figure 17. Upland Pine vegetation community present at the relocation site, immediately adjacent to Lighthouse Bay Drive.

Fire Fuels

Research conducted at the Seashore has shown vegetation changes on the islands of the Outer Banks have resulted from both natural and anthropogenic disturbances (NPS 2001b). There is no evidence that wildland fire played any significant part in maintaining the open character of the dune grasslands. However, wildland fire and the absence of wildland fire have played a role in the overall occurrence and distribution of other vegetation. Lightning, historically and presently, is a rare source of fire north of Cape Fear probably because the thunderstorms on the Outer Banks of North Carolina are typically associated with frontal passages that almost always bring rain.

The majority of the fires occurring at Cape Hatteras National Seashore are human caused. Wildland fires caused by problems with power lines, smoking, and fireworks are the three most common types reported. On average, 8.5 wildland fires occur per year among the three national park units on the Outer Banks (Cape Hatteras National Seashore, Fort Raleigh National Historic Site, and Wright Brothers National Memorial). Wildland fires are typically small fires of moderate intensity, and are usually contained to an area averaging 4.9 acres. Over two-thirds of the fires are Class A and B (0.0 to 9.9 acres). The largest reported wildland fire was 145 acres. Fires have been reported every month of the year, but the majority occur between May 31 and August 28th, a period of time that corresponds with the highest visitation.

Fire prevention includes all activities designed to reduce the number of human-caused wildland fires that occur within the Seashore. The objective of the Seashore's fire prevention program is to minimize preventable fires by modifying fuel complexes around developed areas and in proximity of natural and cultural resource sites to reduce fire behavior and intensity to a manageable level (NPS 2001b).

Bodie Island is designated as Fire Management Unit 3, and all wildland fires in this unit, regardless of origin, will be suppressed using the appropriate management response, which in most cases may be indirect attack using the highway, area roads, power line right-of-way, or water drainage features as control lines (NPS 2001).

Fire behavior is basically a function of fuel type, fuel load, fuel moisture content, topography, and local weather conditions. Fire behavior prediction models were used to model potential fire behavior in various vegetation types found on the Outer Banks. Wildfires burning in all the fuel types present on the Outer Banks have the potential to display extreme fire behavior, particularly during wind events or in areas where the fuel loading is unusually high. National Fire Danger Rating System (NFDRS) Fuel Model O (High Pocosin) and NFFL Fire Behavior Fuel Models for fire fuels in the project area are detailed below (NPS 2001b; M. Callahan, NPS Fire Technician, *pers. comm.*):

> **NFFL Fire Behavior Fuel Model 1 (Annual Grasses)** describes the dry dune grassland, and the dominant vegetation is coarse perennial grasses, with shrubs covering less than two-thirds of the area. This grassland forms an almost continuous band along the margin of the inner berm, and is dominated by sea oats and saltmeadow cordgrass. When exposed to wind and direct sunlight, these fuels dry out rapidly. The natural fire return interval for this vegetation type is unknown, although fire exclusion has resulted in invasion by woody species. Because of the continuous stretches of dry, fine fuel, and the ever-present winds, ignitions catch readily and spread quickly. In general, the dune grasslands will burn less intensely than marsh vegetation because the fuel loading is not as heavy or the fuel as continuous.
>
> Under normal conditions of light winds and reduced slopes, flames can move quickly through this fuel type at a rate of 78 chains per hour (Ch/hr) and with flame heights of 4 ft. Under extreme conditions (high winds, low fuel moisture, and low humidity), fires run through this fuel expeditiously at 311 Ch/hr and with flame heights of 8 ft.
>
> **NFFL Fire Behavior Fuel Model 3 (Saw Grass)** describes the freshwater graminoid marshes.
>
> Fires in this fuel type can burn intensely and spread extremely rapidly (104 Ch/hr with 12 ft flame height) under a wide range of moisture conditions and commonly burns over standing water, especially when it is windy. Under extremely windy conditions, fires run into the upper heights of the grass and across standing water at 950 Ch/hr and with flame heights of 38 ft. Direct attack during the daytime is generally not safe or effective in these fuels unless supported by equipment or aircraft. Peat fires can be a potential problem in this fuel type during periods of severe drought when the water table is one-foot below the surface of the ground or greater.
>
> **NFFL Fire Behavior Fuel Model 4 (NFDRS Fuel Model O - High Pocosin)** describes the dense, brush-like communities of swamp, pine swamp, pine thicket, shrub thickets, and live oak scrub. The Shrub layer is typically continuous, and ranges from 2 to 6 feet high. Shrubs with high volatile content, such as wax myrtle and yaupon may be present. Where pine forms the canopy, a deep litter layer may also be present.
>
> Generally, the fuel are live and vertically arranged to create a fuel ladder from ground to canopy. As a result, the potential of crown fire in this fuel model is high. In general, this vegetation type requires more wind and drier conditions to burn than marshes, but will burn intensely even with

relatively high live fuel moistures. Once a wildland fire starts in pocosin, it is strongly resistant to control due to extreme fire behavior and heavy fuel loading. Even under normal conditions, direct attack using mechanized equipment may not be possible. Fires run through the surface litter rapidly (75 Ch/hr) and have long flame height (19 ft) under normal conditions. Under extreme conditions, fires run through the surface litter expeditiously (263 Ch/hr) and have long flame height (36 ft). A wildfire in this fuel model can exhibit several blowup features including high-density, short-range spotting, a well-developed convection column, and rapid rates of spread.

NFFL Fire Behavior Fuel Model 7 (Southern Rough) describes forests where pine species are dominant or co-dominant. On the Outer Banks, loblolly pine is the primary overstory species, although it is often mixed with hardwoods. A dense low shrub/herb layer with spatially distinct canopy and a thick layer of needles on the surface are generally present in this fuel type. Thousand-hour fuels are significantly more abundant in immature pine. Southern rough naturally burned as often as every two years in northern sections of the Seashore. Fire exclusion has resulted in a reduction of longleaf pine and herbaceous species, and increased the stocking levels of hardwood species in the understory and overstory. Stand stocking (stems/acre) is probably much greater than would be expected under a natural fire regime.

Fires can run through surface and shrub strata with equal ease and can occur at higher dead fuel moisture contents because of the flammability of live foliage and other live materials. Fires run through the surface litter at 20 Ch/hr (slower than under fuels under Model 4, above) and typically have flame height of 5 ft under normal conditions. Depending on overstory and stocking, torching and crowning can occur. Under drought conditions, the level of volatility in live fuels increases and fires become highly resistant to suppression efforts, with a rate of spread at 88 Ch/hr and flame height of 10 ft. Greater intensities should be expected in areas where overstory mortality due to salt spray, flooding, or insects is present.

Current Site

Vegetation present at the current site of the Complex is typical of the backslopes of dunes along the neighboring barrier islands. Since the site is subject to frequent overwash and blowing sand, vegetation is sparse. Scattered clumps of dune grasses are common atop sections of dune that have not recently blown-out. NFFL Fuel Model 1 (Annual Grasses) would best describe these areas.

The nearby shrub thicket, running parallel to NC 12, is best described by the NFFL Fire Behavior Fuel Model 4 (NFDRS Fuel Model O - High Pocosin).

Relocation Site

As detailed above under the Vegetation impact topic, four different vegetation communities are present at the relocation site. Radiating north and south from the Bodie Island Lighthouse Road, the order of vegetation communities are as follows: Upland Pine to Upland Scrub/Shrub to Wetland Scrub/Shrub to Tidal Marsh (Figure 16). The Upland Pine community would best be described by NFFL Fire Fuel Model 7 (Southern Rough). The Upland Scrub/Shrub and Wetland Scrub/Shrub communities would best be described by NFFL Fire Fuel Model 4 (NFDRS Fuel Model O – High Pocosin). The Tidal Marsh community would best be described by NFFL Fire Fuel Model 3 (Saw Grass).

Wildlife and Wildlife Habitat

Current Site

Several species of wildlife common to the Outer Banks of North Carolina were observed in the vicinity of the Complex. Various falcons (e.g., *Falco peregrinus*, *Falco sparverius*), songbirds (families Hirundinidae, Emberizidae, Fringillidae, Icteridae, Laniidae, Corvidae) and shorebirds are frequently observed at the site. Cedar waxwings (*Bombycilla cedrorum*), Carolina wrens (*Thryothorus ludovicianus)*, warblers (family Parulidae), eastern meadowlarks (*Sturnella magna*), thrushes (family Turdidae), and northern cardinals (*Cardinalis cardinalis*) frequent the nearby shrub thicket. Various butterflies, including monarchs (*Danaus plexippus*), swallowtails (family Papilionidae), sulfurs (family Pieridae), and dragonflies are also frequently observed. Among the wildlife observed on the dunes are ghost crabs (*Ocypode quadrata*), eastern glass lizards (*Ophisaurus ventralis*), six-lined racerunners (*Aspidoscelis sexlineata***)**, and black racers (*Coluber constrictor*). Mammals observed on site include red and grey foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*, respectively), feral cats (*Felis catus*), raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), eastern cottontail rabbits (*Sylvilagus floridanus*), various mice (*Peromyscus* spp.), white-tailed deer (*Odocoileus virginianus*). The site and vicinity is likely habitat for many other birds, snakes and other wildlife that inhabit dunes and scrub-shrub wetlands of eastern North Carolina.

Relocation Site

Coastal ponds and marshes in eastern North Carolina provide nesting, resting, and wintering habitat for migratory birds, including the greater snow geese and other migratory waterfowl, shorebirds, wading birds, raptors, and neotropical migrants.

Several species of wildlife common to the Outer Banks of North Carolina were observed in the vicinity of the relocation site (Hartrampf and Quible & Associates, P.C. 2008), including: eastern grey squirrels (*Sciurus carolinensis*), white-tailed deer, eastern cottontail rabbit, raccoon, opossum, red fox, grey fox, various mice, nutria (*Myocastor coypus*), timber rattlesnake (*Crotalus horridus*), chipping sparrows (*Spizella passerina*), mourning dove (*Zenaida macroura*), and northern flicker (*Colaptes auratus*). The site and vicinity is likely habitat for many other birds, snakes and other wildlife that inhabit pine stands and scrub-shrub wetlands of eastern North Carolina.

LIGHTSCAPE

During late fall 2007, the NPS Light Sky Team visited Cape Hatteras National Seashore and drafted maps of lighting zones (NPS 2007 and M. Carfioli, pers. comm., respectively). The vast majority of Cape Hatteras National Seashore is identified as a naturally dark zone, except where permanent artificial light fixtures are present to facilitate park operations (e.g., District Law Enforcement office buildings) and visitor experience (e.g., parking lots, campgrounds).

Current Site

The Bodie Island USCG Station and the USLS Station/Boat House were identified as “park lighting zone 1,” where permanent artificial light fixtures may exist in isolated areas and at certain times. Presumably, there is a negligible impact to human dark adaptation and experiencing of natural lightscapes, in addition to a presumed minimal impact to nocturnal habitat. These areas are situated within a much larger naturally dark zone, which is characterized by the absence of permanent light fixtures. The nearest areas of similar low artificial light are the Bodie Island Maintenance Area and the Coquina Beach parking lot.

Relocation Site

The relocation site was identified as a "naturally dark zone" by the NPS Night Sky Team in 2007. The Coquina Beach parking lot and Bodie Island Lighthouse are considered to be within "park lighting zone 1."

PARK OPERATIONS

Current Site

The USLS Station and Boat House are currently being used to by the NPS for the Bodie Island District Law Enforcement operation. In the USLS Station, there are offices for six permanent Law Enforcement Park Rangers, one Fee Supervisor, and one Law Enforcement Trainee. The USCG Station is currently unoccupied. One permanent Maintenance staff person repairs the failing dune and installs sand fencing as needed.

Relocation Site

The only park operations currently associated with the relocation site is maintenance of a footpath located on the southside of Lighthouse Bay Drive. The footpath is approximately eight feet wide and runs along the existing utility corridor. This corridor contains underground water, electricity, and telephone lines to the Bodie Island Lighthouse and its visitor center.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences associated with the alternatives presented in "Chapter 2: The Alternatives." It is organized by impact topic, which distills the issues and concerns into distinct subjects for discussion analysis. NEPA requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect and cumulative) and measures to mitigate for impacts. NPS policy also requires that impairment of resources be evaluated in all environmental documents; therefore, impairment is addressed in the "Conclusion" section at the end of this chapter. The CEQ regulations that implement NEPA require assessment of impacts to the human environment, which includes natural and cultural resources.

METHODOLOGY FOR ASSESSING IMPACTS

As required by NEPA, potential impacts are described in terms of type (beneficial or adverse, direct or indirect), context (site-specific, local or regional), duration (short-term or long-term), and level of intensity (negligible, minor, moderate, or major). These terms are defined below. Overall, these impact analyses and conclusions were based on the review of existing literature and Cape Hatteras National Seashore studies, information provided by on-site experts and other agencies, professional judgments and park staff insight, and federal agencies. The impact analyses presented in this document are intended to comply with both NEPA and Section 106 of the NHPA; therefore, Section 106 summaries for each cultural resource topic are also included.

Type

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An impact that is caused by an action and occurs at the same time and place.

Indirect: An impact that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable.

Context

Context is the setting within which an impact is analyzed.

Site-specific: The impact would affect the project site.

Local: The impact would affect the Seashore and immediate neighborhood.

Regional: The impact would affect localities, cities or towns surrounding the Seashore.

Duration

Short-term: Impacts that occur only during construction or last less than one year.

Long-term: Impacts that last longer than one year.

Level of Intensity

Because level of intensity definitions (negligible, minor, moderate, or major) varies by impact topic, they are provided separately for each impact topic.

Cumulative Impact Scenario

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 *et seq*.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which 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 non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for the no-action and action alternatives.

Cumulative impacts were determined by combining the impacts of both alternatives with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Cape Hatteras National Seashore and, if applicable, the surrounding region.

Restoration of the USCG Station and USLS Station

Each of the three historic structures (USLS Station, Boat House, and USCG Station) comprising the Bodie Island U.S. Coast Guard Station Complex was stabilized in 2007 (NPS 2006b and 2006c). This work included exterior repairs (foundation, roof, siding, and porches) to make the structure water tight and secure. The stabilization plans for each of the structures also includes preservation and restoration treatment information for the interiors of these structures.

Under Alternative A, the structures would remain at their current locations and the interiors of the structures would be maintained in good condition to the maximum extent possible although restoration would not occur. Restoration means the act or process of accurately depicting the form, features and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period.

Restoration of the structures would occur under Alternative B, as soon as reasonably possible following the relocation of the structures to the Lighthouse Bay Drive site. During this restoration process, a limited and sensitive upgrading of mechanical, electrical, and plumbing systems in addition to other code-required work to make properties functional would be undertaken.

Widening and Repaving NC 12

The 5.28 mile-long segment of NC 12 on Bodie Island, from Whalebone Junction to the site currently occupied by the USCG Station, is in need of repaving. The road was originally paved in 1959 and resurfaced, most recently, in 1992. Cyclic roadway maintenance is performed every 10 to 12 years. This segment of NC 12 has a rating of fair to good condition, indicating that maintenance is needed in the near future (G. Robinson, pers. comm.).

Much of this road has pavement raveling in the wheel paths. Other areas are showing localized fatigue cracking and numerous well-defined longitudinal and transverse cracking. The roadway fills up with water causing slick surfaces from light showers. This coupled with irregular surfaces, potholes, and other minor defects makes the roadway hazardous to the public. Also within this segment of NC 12 are numerous pulloffs and four corrugated metal pipe culverts. Some of the pulloffs are asphalt-paved, while others are covered with gravel. The pipe culverts are approximately 20 years old. Since this segment of NC 12 is owned by the NPS, the NPS and the Eastern Federal Lands Highway Division (EFLHD) of the Federal Highway Administration (FHWA) propose to repave this 5.28 mile-long segment of NC 12, as well as repave numerous pulloff and replace four corrugated metal pipe culverts also present within this road segment within the next 5 years.

Widening the 5.28 mile-long segment of NC 12 on Bodie Island would allow for the creation of 5 foot-wide bicycle lanes on each of the shoulder. NCDOT would undertake widening of the remaining 2.82 mile-long segment of NC 12 from the site currently occupied by the USCG Station southward to the Oregon Inlet Fishing Center. Widening of NC 12 on Bodie Island would result in the establishment of AASHTO standard bicycle-safe, paved, road shoulders.

Repaving and widening of the 5.28 mile-long segment of NC 12, repaving of the pulloffs, replacement of culverts are planned to begin in the summer of 2010. During this road construction period, vehicular traffic would be rerouted onto the parallel roadway, commonly referred to as the "beach road" (SR 1243) for a distance of 4.6 miles south from Whalebone Junction. The repaved segment of NC 12 would reopen before Memorial Day (May 30) 2011.

The existing paved access roads and parking areas at the USCG Station (25,760 sq. ft.) and at the USLS Station / Boat House site (3,420 sq. ft.) would serve as staging areas for this proposed action. Following the completion of the widening and repaving of NC 12, these paved surfaces and associated walkways would be removed and the floodplain restored. The total area restored would be 29,560 sq. ft. (0.68 acre).

Widening and Repaving Lighthouse Bay Drive

The NPS is considering widening and repaving Lighthouse Bay Drive within the next 10 to 15 years. Lighthouse Bay Drive provides the only road to the Bodie Island Lighthouse. The existing road was paved in the 1990s, and its current width is 18 feet for two-way traffic. Since 1990, there has been an increase in visitation to the Lighthouse and a low speed, head-on collision that resulted in a fatality in April 1999. Therefore, widening of Lighthouse Bay Drive is considered necessary to remedy this existing safety hazard. Widening would result in a 28 foot-wide paved surface, comprised of two 12 foot-wide lanes, each with 5 foot-wide shoulders to accommodate bicycle traffic.

Replacement of Water Main

The existing water main is located underground on the east side of NC 12 within in the project area. Replacement of the underground water line by the NPS is planned to occur within the next five years from the NPS' Bodie Island Maintenance Facility to Oregon Inlet Fishing Center. Replacement of the water main would result in either the abandonment of the existing water main or the removal of the existing line coupled with installation of a new main. If the existing water main is to be abandoned, then the replacement main would potentially be installed on the west side of NC 12. The line would be replaced in the area between the edge of the southbound lane and the existing drainage ditch.

Water line service along Lighthouse Bay Drive to the Complex and the Bodie Island Lighthouse would also potentially be replaced and the new line installed along Lighthouse Bay Drive.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of particular resources. Because both of these cumulative actions are in the early stages, the evaluation of cumulative impacts was based on a general description of the action. Cumulative impacts are considered for all alternatives, and are presented at the end of each impact topic discussion. In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

Imperceptible: The incremental effect contributed by the alternative to overall cumulative impacts is such a small increment that it is impossible or extremely difficult to discern.

Noticeable: The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impacts.

Appreciable: The incremental effect contributed by the Alternative constitutes a large portion of the overall cumulative impact.

Impairment of Park Resources or Values

In addition to determining the environmental consequences of the alternatives, NPS *Management Policies* (NPS 2006) and DO #12 require analysis of potential impacts to determine whether or not actions would impair park resources. A fundamental purpose of the NPS, as provided for in its Organic Act (1916) and reaffirmed by the General Authorities Act (1970), as amended in 1978, begins with a mandate to conserve park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the Seashore, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirements that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources and values. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in establishing legislation or proclamation of the Seashore;

- Key to the natural or cultural integrity of the Seashore or to opportunities for enjoyment of the Seashore; or

- Identified as a goal in the Seashore's *General Management Plan / Development Concept / Amended Environmental Assessment* (1984) or other relevant planning documents.

Impairment would result not only from activities in managing the Seashore, but also visitor activities or activities undertaken by others operating in the Seashore. An impairment determination is provided for at the end of this chapter in the "Conclusion" section.

IMPACTS TO CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

In this EA, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the CEQ that implement the NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA and Section 106 of the NHPA. In accordance with the ACHP regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to archeological resources and the cultural landscape were identified and evaluated by: (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the ACHP regulations a determination of either adverse effect or no adverse effect must also be made for affected National Register eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register (e.g. diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused

by the alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision-making* (2001a) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 would be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis sections under the alternative. The Section 106 Summary is intended to meet the requirements of Section 106 and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

HISTORIC STRUCTURES

Methodology

In order for a structure or building to be listed on the National Register, it must be associated with an important historic context, i.e. possess significance – the meaning or value ascribed to the structure or building, and have integrity of those features necessary to convey its significance, i.e. location, setting, design, feeling, association, workmanship, and materials (NPS 1990.) For purposes of analyzing potential impacts to historic structures/structures, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest level of detection, with neither adverse nor beneficial consequences. For the purposes of Section 106, the determination of effect would be no adverse effect.

Minor: Adverse impact – Alteration of a feature(s) would not diminish the overall integrity of the resources. For the purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial Impact – Stabilization/preservation of character-defining features in accordance with the Secretary of the Interior Standards for the Treatment of Historic Properties. For the purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Adverse impact – Alteration of a feature(s) would diminish the overall integrity of the resource. For the purposes of Section 106, the determination of effect would be adverse effect. A Memorandum of Agreement (MOA) is executed among the NPS and applicable state and/or tribal historic preservation offices and if necessary, the ACHP in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Beneficial impact – Rehabilitation of a structure or building in accordance with the Secretary of the Interior Standards for the Treatment of Historic Properties. For the purposes of Section 106, the determination of effect would be no adverse effect.

Major: Adverse impact - Alteration of a feature(s) would diminish the overall integrity of the resource. For the purposes of Section 106, the determination of effect would be adverse

effect. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state and/or tribal historic preservation officer and/or the ACHP are unable to execute a MOA in accordance with 36 CFR 800.6(b).

Beneficial impact – Restoration of a structure of building in accordance with the Secretary of the Interior Standards for the Treatment of Historic Properties. For the purposes of Section 106, the determination of effect would be no adverse effect.

Impacts of Alternative A (No-Action)

Under Alternative A, the structures would remain at their current locations. Each of the three historic structures comprising the Complex was stabilized in 2007 (NPS 2006b and 2006c). This work included exterior repairs (foundation, roof, siding, and porches) to make the structure water tight and secure. Additional exterior repairs would be undertaken to maintain the structures in good condition to the maximum extent possible. However, deterioration would continue to the point that the integrity of the character-defining features of the National Register status was diminished and historic fabric lost. This would result in a short- and long-term, major, adverse impact to one, two, or all three of these historic structures.

The dune located immediately east of the Complex would be rebuilt as necessary to be protective of the structures. In the event of a dune blow-out which results in damage to any of the three historic structures, the Seashore's Cultural Resource Manager would consult with appropriate park staff and SHPO to determine if rebuilding the dune would be technically feasible, reasonable, and necessary to protect the three historic structures.

Since the NPS preserves and protects a unique collection of USLS and USCG Stations at Cape Hatteras National Seashore and the 1879 USLS Station is the only remaining structure representative of the 1876 Carpenter Gothic style, irreparable damage to the 1879 USLS Station would constitute impairment of the Seashore's cultural resource integrity. Irreparable damage to the 1916 Boat House or 1925 USCG Station would not constitute impairment of the Seashore's cultural resource integrity because other examples of these construction periods and architectural styles occur on the Outer Banks.

Section 106 Summary

After applying the ACHP criteria of adverse effects (36 CFR 800.5 Assessment of Adverse Effects), the NPS concludes that implementation of Alternative A would have an adverse effect on one, two, or all three historic structures.

Cumulative Impacts

Restoration of the USCG Station, Life-Saving Station, and Boat House would not be undertaken under Alternative A. No other present or reasonably foreseeable future actions have or continue to contribute impacts to historic structures in and around the project site. Therefore, there is no cumulative impact.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures be relocated to a site located approximately 0.6 miles south of their current locations. Regardless of the distance and orientations of the structures, relocating them constitutes a moderate, adverse impact on these historic structures. However, the historic arrangement and orientation of the structures to each other and the Ocean would be maintained. The historic structures would be used in a manner consistent with their historic use.

Preparation, extraction, transport, and reinstallation of the structures would be performed in a manner that would minimize adverse impacts on the structures. The concrete foundation of the USCG Station and the wood pilings for the USLS Station and Boat House would remain on-site. Relocating the USCG Station without its original concrete foundation constitutes a moderate, adverse impact to this historic structure. Relocating the USLS Station and Boat House without their original wood pilings has no effect on these historic structures.

The USCG Station would be relocated to a site immediately north of the Lighthouse Bay Drive, while the USLS Station and Boat House would be relocated to a site immediately south of the Lighthouse Bay Drive. This arrangement mimics the historic arrangement and alignments of the structures as they were in 1925, following the construction of the USCG Station building. Maintenance of the historic arrangement and orientation of the buildings would lessen the overall impact of relocation of the structures.

The USLS Station and Boat House would continue to serve the Bodie Island District Law Enforcement operations. The USCG Station would also be used to support park operations. This arrangement allows for safe and timely egress for Bodie Island District Law Enforcement from the USLS Station to NC 12, as was a priority of the historic siting, orientations, and uses of the structures. Maintenance of the historic uses for safely conducting emergency response services lessens the overall impact of relocation of the structures.

Under this alternative, the relocation site would be cleared to establish a fire buffer zone around each of the historic structures. Fire buffer zones around each of the structures would be maintained in the long-term to minimize the risk of fire damage to these structures.

The overall impact to historic structures would be moderate and adverse in the short- and long-term.

Section 106 Summary

After applying the ACHP criteria of adverse effects (36 CFR 800.5 Assessment of Adverse Effects), the NPS concludes that relocation of the structures would have an adverse effect on the historic structures. Maintenance of the historic arrangement, orientation, and uses are mitigating measures. The ACHP has been notified of this adverse effect and mitigating measures that would result from the implementation of Alternative B. The ACHP has agreed to these conditions (D. Stover, pers. comm.), and the National Register information for these structures would be amended.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to historic structures at and around the project area. The widening and repaving of NC and Lighthouse Bay Drive would have no effect on the Complex. The future restoration of the Complex would have a long-term, major, beneficial impact on these historic structures and result in a no adverse effect finding under Section 106. Therefore, Alternative B would contribute a noticeable, adverse increment to the long-term, major, beneficial impact with respect to NEPA and have no adverse effect with respect to Section 106 on historic structures.

GEOLOGIC RESOURCES

Methodology

All available information on geologic resources potentially impacted in various areas of the Seashore was compiled. Mapping of existing geologic resources conditions was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts

were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts to geologic resources would be below or at the lower levels of detection.

Minor: The impacts to geologic resources would be detectable and small. Mitigation would be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.

Moderate: The impacts on geologic resources would be readily apparent and result in a change to topography over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

Major: The impacts on geologic resources would be readily apparent and would substantially change the character of those resources over a large area in and out of the Seashore. Mitigation measures to offset adverse impacts would be needed, extensive, and their success would not be guaranteed.

Impacts of Alternative A (No-Action)

Under Alternative A, the dune located immediately east of the Complex would be rebuilt as necessary to be protective of the structures in accordance with the terms and conditions agreed to under an existing federal consistency concurrence (#CD07-015) through 2010. The NPS would seek to renew or reapply for another federal consistency concurrence to continue dune maintenance and repair beyond 2010.

In the event of a dune blow-out which results in damage to any of the three historic structures, the NPS would consult with the SHPO and other stakeholders to determine if rebuilding the dune would be technically feasible, reasonable, and necessary to protect the three historic structures. If a dune blow-out results in restricting vehicular traffic on NC 12, the NPS would work with NCDOT to restore normal traffic patterns and flow in addition to dune reconstruction if necessary. Since the dune is located over 400 feet from NC 12, the likelihood that dune repair would be necessary to protect NC 12 is low.

Under this alternative, the rebuilding of dunes to protect historic structures would be in direct conflict with natural geologic resources on a 0.3-mile stretch of seaward shoreline. Therefore, the impact to geologic resources would be short-term, minor and adverse in a localized area.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to geologic resources in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on geologic resources. Alternative A would contribute a noticeable, adverse increment to the cumulative impact on geologic resources.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures be relocated from the seaward shoreline to a nearby site that is not immediately abutting the seaward dune line. By relocating the structures from close proximity to the dune line, the likelihood of needing to rebuild the dune is substantially decreased. Under this alternative, the structures would be located approximately 1,000 feet from the dunes located immediately east of the Coquina Beach parking area and beach access. A dune blow-out at this location would likely not adversely affect the historic structures. However, parking at the Coquina Beach parking lot and vehicular traffic on NC 12 would be affected by a dune blow-out in this vicinity.

Under this alternative, the dune at the formerly occupied site would only be reconstructed if a dune-blow out resulted in limiting vehicular traffic on NC 12. Dune reconstruction would be performed by NCDOT only if the NPS is in concurrence with its need to be reconstructed. The NPS would evaluate any and all proposals from NCDOT for dune reconstruction.

The overall impact to geologic resources would be short- and long-term, moderate, and beneficial in a localized area.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to geologic resources in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on geologic resources. Alternative B would contribute a noticeable, adverse increment to the cumulative impact on geologic resources.

SOILS

Methodology

All available information on soils potentially impacted in various areas of the Seashore was compiled. Mapping of existing soils was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would result in a change to soils, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would result in a detectable change to soils, but the change would be expected to be small, of little consequence, and localized. There would be no appreciable increased risk to life or property. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts would result in a change to soils that would be readily detectable and relatively localized. Location of operations in soils would increase risk to life or property. Mitigation measures, if needed to offset adverse effects, would be extensive, but would likely be successful.

Major: Impacts would result in a change to soils that would have substantial consequences on a regional scale. Location of operations would increase risk to life or property. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Impacts of Alternative A (No-Action)

Under Alternative A, rebuilding of the dune immediately east of the Complex would be rebuilt as needed to be protective of the structures, the NPS law enforcement operation on Bodie Island, and vehicular passage on NC 12. Where possible, the blown-out piles of sand would be mechanically moved to rebuild the dune. Supplemental soils native to the island would be used as needed. Overall, the activities to be conducted under Alternative A would result in continued short- and long-term, minor, adverse impacts to soils.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to soils in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on soils. Alternative A would contribute a noticeable, adverse increment to the cumulative impact on soils.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures would be relocated to a site that was previously disturbed during the construction of the Lighthouse Bay Drive and underground utility installation.

Preparation of the structures for relocation is expected to result in temporary disturbance of soils. All activities would be limited to 0.15 acre (or less) at the site currently occupied by the USLS Station and Boat House, and activities would be limited to 0.9 acre (or less) at the site currently occupied by the USCG Station. Construction vehicles would use existing paved surfaces to the maximum extent possible. However, building preparation and transportation activities would occur on undeveloped soils within each of these sites. Site soils are fine sands that can migrate easily, and the depth of soil impact is expected to be limited to the top 12 inches. Migration of soils would be controlled by limiting the area of potential disturbance in concert with the maintenance of silt fencing.

To minimize the impacts of relocating these historic structures, the existing septic systems would not be removed. Rather, the existing septic systems for the USLS Station and USCG Station would remain on-site. Contents of each of these septic tanks would be pumped out, the tanks would be crushed, and filled with native soils. The USLS Station septic system is 720 sq. ft.; therefore, a volume of upto 27 cubic yards (cu. yd.) would be needed. The USCG Station septic system is 1400 sq. ft.; therefore, a volume of upto 52 cu. yd. would be needed.

Preparation of the relocation site includes vegetation clearing and grubbing; installation and maintenance of silt fencing; and modification of underground utility lines to provide service to the relocated structures. All of these site preparation activities would be limited to a 0.38 acre site north of the Lighthouse Bay Drive for the installation of the USCG Station and limited to a 0.38 acre site south of Lighthouse Bay Drive for the installation of the USLS Station and Boat House. Vegetation clearing and grubbing would stir surface soils and allow them to migrate more easily. Migration of soils would be controlled by limiting the area of potential disturbance in concert with the maintenance of silt fencing.

Since the USCG Station and USLS Station would be used by NPS staff , septic systems have been sized accordingly. The relocation site soils are not optimal for septic system functioning, off-site rock and soils would be imported to construct two separate mound septic systems in accordance with applicable state (15A NCAC 18A) and federal regulations. Rock used in soil absorption systems shall be clean, washed gravel or crushed stone and graded or sized in accordance with applicable state and federal regulations. Soil used in soil absorption systems shall have a soil texture of sand or loamy sand. The top 6 inches of the mound system shall have a finer texture for the establishment of a vegetative cover. The slope of the site shall not exceed 2 percent.

Establishment of a septic mound system to support use of the USLS Station would require the import of between 259 cu. yd. and 417 cu. yd. of rock and soils. Establishment of a septic mound system to support the use of the USCG Station would require the import of between 370 cu. yd. and 556 cu. yd. of rock and soils.

Overall, the impact to soils in the short-term would be moderate and adverse. However, in the long-term the impacts to the floodplain functions and values would be minor and adverse.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to soils in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on soils. Alternative B would contribute an imperceptible, adverse increment to the cumulative impact on soils.

FLOODPLAINS

Methodology

All available information on floodplains potentially impacted in various areas of the Seashore was compiled. Mapping of existing floodplain conditions was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would result in a change to floodplain functions and values, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would result in a detectable change to floodplain functions and values, but the change would be expected to be small, of little consequence, and localized. There would be no appreciable increased risk to life or property. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts would result in a change to floodplain functions and values that would be readily detectable and relatively localized. Location of operations in floodplains would increase risk to life or property. Mitigation measures, if needed to offset adverse effects, would be extensive, but would likely be successful.

Major: Impacts would result in a change to floodplain functions and values that would have substantial consequences on a regional scale. Location of operations would increase risk to life or property. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Impacts of Alternative A (No-Action)

Collectively, the buildings and their associated support facilities (e.g., parking areas, access roads, septic systems) currently occupy 0.78 acre. All three historic structures and their support facilities are located within the 100-year floodplain. Under Alternative A, these would remain as on-site and would not be upgraded.

The USCG Station is currently on a concrete foundation which occupies 2,185 sq. ft. Its support facilities include: a 1,400 sq. ft. septic system; 25,760 sq. ft. of asphalt parking and driveway; and 90 sq. ft. of concrete walkway. At this site, a total of 29,435 sq. ft. (0.68 acre) of the 100-year floodplain is occupied.

The USLS Station is currently on wood pilings which occupies 11 sq. ft. The Boat House is currently on wood pilings which occupies 9 sq. ft. Support facilities for these structures include: a 720 sq. ft. septic system; 3,420 sq. ft. of asphalt parking and driveway; and 290 of concrete walkway. At this site, a total of 4450 sq. ft. (0.1 acre) of the 100-year floodplain is occupied.

Overall, the activities to be conducted under Alternative A would result in no new impacts to the local floodplain.

Cumulative Impacts

Because the No-Action Alternative would have no impact on floodplains, no analysis of cumulative impacts is required.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, preparation of the structures for relocation would result in temporary disturbance of soils. All activities would be limited to 0.15 acre (or less) at the site currently occupied by the USLS Station and Boat House site, and activities would be limited to 0.9 acre (or less) at the site currently occupied by the USCG Station.

The building foundations and support facilities (e.g., septic systems, access roads, parking areas) would remain on-site because these components are considered culturally significant features of the historic structures. The access roads, parking areas, and concrete walkways would remain on-site to considered for use as potential staging areas for a future action (see "Widening and Repaving of NC 12" section in Chapter 4 of the EA for details) and potentially removed as mitigation for floodplain impacts resulting from that action. The 100-year floodplain would continue to be occupied by these structures, a total of 29,435 sq. ft. (0.68 acre) at the USCG Station and a total of 4,450 sq. ft. (0.10 acre) at the USLS Station and Boat House site.

The Complex would be relocated to a site to a site that was previously disturbed during the construction of the Lighthouse Bay Drive and underground utility installation. Site preparation activities at the relocation site would temporarily impact 0.38 acre north of Lighthouse Bay Drive and 0.38 acre south of Lighthouse Bay Drive. These activities include vegetation clearing and grubbing; installation of pilings to support the buildings; modification of existing underground utilities to provide service to the relocated buildings; establishment of two mound septic systems; installation of the structures, parking areas, driveways, and walkways that meet the requirements of the Americans with Disabilities Act (ADA-compliant). The long-term impact area associated with relocation of the buildings (e.g., walkways, parking areas, septic mound systems and other utilities) is 0.21 acre north of Lighthouse Bay Drive and 0.14 acre south of Lighthouse Bay Drive.

Under this alternative, each of the three historic structures would be secured on wood pilings at a finished floor height above the base flood elevation of 10 feet, in accordance with the National Flood Insurance Program V zone construction standards. Since these historic structures and their support facilities can not be assured of protection from all future damage related to flood/storm events, the NPS would tolerate risk to these structures and facilities. A Statement of Findings for Floodplains was prepared in accordance with DO#77-2 to account for the impacts to the floodplain in the project area and the potential risk involved in placing facilities within the floodplains (see Appendix C).

Overall, the new impact to floodplain functions and values in the short-term would be minor, adverse and occur on 1.81 acres. The long-term impacts to the floodplain functions and values of relocating the three historic structures and establishment of support facilities would be negligible, adverse, and limited to a total area of 0.35 acre.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to floodplain functions and values in and around the project area. Replacement of the underground water

main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on floodplains. The repaving and widening of NC 12 would use the abandoned Complex access roads and parking areas as staging areas. The long-term impact of this proposed action would potentially be offset by the removal of the support facilities (e.g., access roads, parking areas, walkways) and result in restoration of 0.68 acre the 100-year floodplain.

Alternative B would contribute an imperceptible, adverse increment to the cumulative impact on floodplains.

VEGETATION

Methodology

All available information on vegetation potentially impacted in various areas of the Seashore was compiled. Mapping of existing vegetation conditions was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Individual plants would be affected, but changes in the natural function and character of the native vegetation communities in terms of growth, abundance, reproduction, distribution, structure, or diversity of native species would not be measurable or perceptible.

Minor: Effects on multiple plants would be measurable or perceptible. However, the natural function and character of native vegetation communities in terms of growth, abundance, reproduction, distribution, structure, or diversity of native species would only be perceptible in small localized areas.

Moderate: A change would occur in the natural function and character of the native vegetation communities in terms of growth, abundance, reproduction, distribution, structure, or diversity of native species, but not to the extent that vegetation community properties (i.e., size, integrity, or continuity) change.

Major: Effects on native vegetation community properties would be readily apparent and would substantially change the natural function and character of the vegetation community.

The thresholds of change for the duration of an impact are defined as follows:

Short-term effects are apparent over two or three growing seasons or less corresponding to initial management actions.

Long-term effects are changes that would be detectable over multiple seasons and would persist over the lifetime of the plan and beyond.

Impacts of Alternative A (No-Action)

Under Alternative A, no new project-related vegetation disturbance would occur. Overall, there would be no impact to vegetation under Alternative A.

Cumulative Impacts

Because the No-Action Alternative would have no impact on vegetation, no analysis of cumulative impacts is required.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures would be relocated from a frequently disturbed and sparsely vegetated site to a site that has recently been minimally disturbed and is well-vegetated.

Preparation of the structures for relocation is expected to result in temporary disturbance of vegetation. All activities would be limited to 0.15 acre (or less) at the site currently occupied by the USLS Station and Boat House site, and activities would be limited to 0.9 acre (or less) at the site currently occupied by the USCG Station. No vegetation clearing is necessary to prepare the structures for relocation or to permit extraction and transport of the buildings to the relocation site.

At the relocation site, vegetation would be removed to facilitate installation of the structures, associated facilities, and establish a fire buffer zone around each of the structures. Of these purposes, establishment of the fire buffer zone would result in the greatest acreage of impact. A fire buffer zone, extending from the exterior walls from each building would be established in accordance with the Seashore's *Fire Management Plan* (NPS 2001b). The fire buffer zone width would be a maximum of 50 feet on all four sides of the USCG Station and Boat House; the fire buffer zone width would be a maximum of 50 feet on the north, east, and west faces of the USLS Station and would be a maximum of 27 feet on the south face of the USLS Station to avoid impacting the wetland to the south (23 feet to the south of the vegetation clearing and grubbing limits). The total acreage to be cleared north of Lighthouse Bay Drive for the relocation of the USCG Station is 0.38 acre. The total acreage to be cleared south of Lighthouse Bay Drive for the relocation of the USLS Station and Boat House is 0.38 acre. Therefore, the total acreage to be cleared in preparation for the relocation of these three structures is 0.76 acre. The Upland Pine vegetation community dominates both of these sites.

Once the buildings are relocated vegetation would regrow on upto 0.31 acre of the cleared area surrounding the USCG Station and 0.23 acre of the cleared area surrounding the USLS Station and Boat House. As needed, it would be managed to reduce fire fuels. All three structures would be placed on wood pilings at the relocation site, with a finished floor height above the base flood elevation of 10 feet. Natural vegetation would recover and species specifically adapted to the light, soil, and hydrologic conditions provided beneath the structures would inhabit the site. Seeds from the Upland Pine and nearby Scrub/Shrub vegetation communities would germinate and revegetate the site over time.

There would be short-term, minor, adverse impacts to vegetation. In the long-term, impacts to vegetation would be negligible and adverse.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to vegetation in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on vegetation. Alternative B would contribute a noticeable, adverse increment to the cumulative impact on vegetation.

FIRE FUELS

Methodology

All available information on fire fuels and fire behavior models for vegetation in the project area. Mapping of existing vegetation conditions and fuels was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on these data. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Individual plants would be affected, but changes in the natural function and character of the fire fuel loads or behavior would not be measurable or perceptible.

Minor: Effects on multiple plants would be measurable or perceptible. However, the natural function and character of fire fuel loads or behavior would only be perceptible in small localized areas.

Moderate: A change would occur in the natural function and character of fire fuel loads or behavior, but not to the extent that vegetation community properties (i.e., size, integrity, or continuity) change in the Bodie Island Fire Management Unit.

Major: Effects on native vegetation community properties would be readily apparent and would substantially change fire fuel loads or behavior in the Seashore.

The thresholds of change for the duration of an impact are defined as follows:

Short-term effects are apparent over two or three growing seasons or less corresponding to initial management actions.

Long-term effects are changes that would be detectable over multiple seasons and would persist over the lifetime of the plan and beyond.

Impacts of Alternative A (No-Action)

Under Alternative A, there would be no change in management of fire fuel loads. Therefore, there is no impact on fire fuel loads under this alternative.

Cumulative Impacts

Because the No-Action Alternative would have no impact on fire fuel loads, no analysis of cumulative impacts is required.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, preparation of the three structures for relocation is expected to no impact on fire fuel loads at the sites currently occupied by the Complex.

At the relocation site, vegetation would be removed to facilitate installation of the structures, associated facilities, and establish a fire buffer zone around each of the structures. Of these purposes, establishment of the fire buffer zone would result in the greatest acreage of impact. A fire buffer zone, extending from the exterior walls from each building would be established in accordance with the Seashore's *Fire Management Plan* (NPS 2001b). The fire buffer zone width would be a maximum of 50 feet on all four sides of the USCG Station and Boat House; the fire buffer zone width would be a maximum of 50 feet on the north, east, and west faces of the USLS Station and would be a maximum of 25 feet on the south face of the USLS Station to avoid impacting the wetland to the south (over 30 feet to the south of the vegetation clearing and grubbing limits). The total acreage to be cleared north of Lighthouse Bay Drive for the relocation of the USCG Station is 0.38 acre. The total acreage to be cleared south of Lighthouse Bay Drive for the relocation of the USLS Station and Boat House is 0.38 acre. Therefore, the total acreage to be cleared in preparation for the relocation of these three structures is 0.76 acre. The Upland Pine vegetation community dominates both of these sites. Once the buildings are relocated vegetation would regrow on upto 0.31 acre of the cleared area surrounding the USCG Station and 0.23 acre of the cleared area surrounding the USLS Station and Boat House. As needed, it would be managed to reduce fire fuels in the long-term.

Reduction of fire fuel loads in the Upland Pine vegetation community adjacent to Lighthouse Bay Drive would result in short- and long-term, minor, beneficial impacts to the fire fuel loads in the Bodie Island Fire Management Unit.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to vegetation in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, negligible, and beneficial cumulative impact on fire fuels. Alternative B would contribute an appreciable, beneficial increment to the cumulative impact on vegetation.

WILDLIFE AND WILDLIFE HABITAT

Methodology

All available information on wildlife and wildlife habitat potentially impacted in various areas of the Seashore was compiled. Surveys were conducted on-site to document species observations and their associated habitats. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them.

Minor: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable. Occasional responses by some individuals to disturbance would be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors might occur. However, some impacts might occur during critical reproduction periods for a species, but would not result in injury or mortality. Sufficient habitat in the Seashore would remain functional to maintain the viability of the species in the Seashore.

Moderate: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable. Frequent responses to disturbance by some individuals would be expected, with some adverse impacts to feeding, reproduction, resting or other factors affecting local population levels. Some impacts might occur during critical periods of reproduction or in key habitats in the Seashore and result in harassment, injury, or mortality to one or more individuals. However, sufficient population numbers or habitat in the Seashore would remain functional to maintain the viability of the species in the Seashore.

Major: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable. Frequent responses to disturbance by some individuals would be expected, with adverse impacts to feeding, reproduction, or other factors resulting in a decrease in park population levels. Impacts would occur during critical periods of reproduction or in key habitats in the Seashore and result in direct mortality or loss of habitat that might affect the viability of a species in the Seashore. Local population numbers, population structure, and other demographic factors might experience large declines.

Impacts of Alternative A (No-Action)

Under Alternative A, there would be no new impact to wildlife and wildlife habitat.

Cumulative Impacts

Because the No-Action Alternative would have no impact on wildlife and wildlife habitat, no analysis of cumulative impacts is required.

Impacts of Alternative B (NPS Preferred Alternative)

Preparation of the structures for relocation is expected to result in temporary disturbance to wildlife and wildlife habitat. All activities would be limited to 0.15 acre (or less) at the site currently occupied by the USLS Station and Boat House site, and activities would be limited to 0.9 acre (or less) at the site currently occupied by the USCG Station. Building preparation activities would be limited to the daylight hours and be negligible in intensity. During evening hours, temporarily displaced wildlife would use the site. Similar suitable habitats are available in the vicinity of the Complex, and temporarily displaced wildlife would be negligibly impacted by disturbance at the site.

Preparation of the relocation site includes vegetation clearing and grubbing, construction vehicle access to the site, and ground disturbance. Wildlife habitat within the vicinity of vegetation clearing would be temporarily disturbed. The wildlife would be temporarily or permanently displaced to nearby suitable habitat. Since the disturbance associated with site preparation would be temporary on the site, minor adverse impacts would result for wildlife and wildlife habitat in the vicinity. During the evening hours, wildlife would return to the site and some would benefit in the long-term from the disturbance on this site. Similar suitable habitats are available in the vicinity of the relocated Complex, and temporarily displaced wildlife would be negligibly impacted by disturbance at the site.

The overall impact to wildlife and wildlife habitat in the short-term is minor and adverse. In the long-term, the overall impact to wildlife and wildlife habitat is negligible and adverse.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to wildlife and wildlife habitat in and around the project area. Replacement of the underground water main along NC 12, repaving and widening NC 12, and widening of Lighthouse Bay Drive would collectively have a long-term, moderate, and adverse cumulative impact on wildlife and wildlife habitat. Alternative B would contribute an imperceptible, adverse increment to the cumulative impact on wildlife and wildlife habitat.

LIGHTSCAPE

Methodology

During late fall 2007, the NPS Light Sky Team visited Cape Hatteras National Seashore and drafted outdoor lighting guidelines and maps of lighting zones (NPS 2007; M. Carfioli, pers. comm.). The vast majority of Cape Hatteras National Seashore is identified as a naturally dark zone, except where permanent artificial light fixtures are present to facilitate park operations (e.g., District Law Enforcement office buildings) and visitor experience (e.g., parking lots, campgrounds).

The following thresholds for evaluating impacts on lightscape were defined and applied to beneficial and adverse impacts:

Negligible: Lightscape would not be impacted or the impact would not have a noticeable or measurable impact on Seashore or agency operations.

Minor: Impacts would be noticeable and would result in a measurable, but small, change in the lightscape.

Moderate: Impacts would be readily apparent and would result in a substantial change in the lightscape that would be noticeable to staff and the public.

Major: Impacts would be readily apparent and would result in a substantial change in the lightscape that would be noticeable to staff and the public and would be markedly different from existing operations.

Impacts of Alternative A (No-Action)

Under Alternative A, the three historic structures would remain at their current site. There would be no change in the existing lightscape or lighting fixtures.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to lightscape at and around the project area. Alternative A would not contribute to the cumulative impact on lightscapes.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures would be relocated from their relatively secluded site near the Atlantic Ocean to a more high profile site where the lightscape is negligibly impacted by existing lights for the Coquina Beach parking area and the Bodie Island Lighthouse. Preparation of the structures and the relocation site would be undertaken during daytime hours, and there would be no impact of artificial light on the existing dark sky in the project area. In the long-term, relocation of the structures from a naturally dark Ocean-side setting to a site closer to existing low artificial lighting areas would have a long-term, minor, beneficial impact on the naturally dark beach setting and a long-term, negligible, adverse impact on the existing naturally dark site. Relocation of these historic structures closer to existing low artificially lit areas (e.g., Coquina Beach, Bodie Island Lighthouse) is not additive and does not alter the lighting zone classification for these areas.

The USLS Station and Boat House would continue to serve the Bodie Island District Law Enforcement operations. The USCG Station would also be used to support park operations. Although upgrades to the lighting fixtures may be undertaken during the restoration of these structures, these upgrades would provide the minimum suitable lighting to facilitate use of the structures and would not increase the intensity or abundance of artificial lighting in these areas. The lighting zone classification surrounding these facilities would remain “park lighting zone 1.”

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to lightscape at and around the project area. Alternative B would not contribute to the cumulative impact on lightscapes.

PARK OPERATIONS

Methodology

Park operations, for the purpose of this analysis, refers to the quality and effectiveness of NPS staff to manage resources and provide for an effective visitor experience. This includes an analysis of the projected need for staff time and materials to implement each of the alternatives. The analysis also considered trade-offs for staff time or the budgetary needs required to accomplish the proposed alternatives and discusses each alternative in terms of its impacts to the Interpretation, Resource Management, Maintenance, and Law Enforcement Divisions at the Seashore. Seashore staff from each of the divisions were members of the planning team, and were consulted regarding expected staffing and funding needs under each alternative. The impact analysis is based on the current description of park operations presented in the "Affected Environment" chapter of this document.

The following thresholds for evaluating impacts on Seashore management and operations were defined and applied to beneficial and adverse impacts:

Negligible: Park operations would not be impacted or the impact would not have a noticeable or measurable impact on Seashore or agency operations.

Minor: Impacts would be noticeable and would result in a measurable, but small, change in park operations. Any required changes in Seashore staffing and funding would be accommodated within normal budget cycles and expected annual funding without appreciably affecting other operations within the Seashore. Current levels of funding and staffing would not be reduced or increased, but priorities would need to be changed.

Moderate: Impacts would be readily apparent and would result in a substantial change in park operations that would be noticeable to staff and the public. Required changes in Seashore staffing and/or funding would not be accommodated within expected annual funding and would measurably affect other operations within the Seashore by shifting staff and funding levels between operational divisions. Increases or decreases in staff and funding would be needed or other park operations would have to be reduced and/or priorities changed.

Major: Impacts would be readily apparent and would result in a substantial change in park operations that would be noticeable to staff and the public and would be markedly different from existing operations. These changes in Seashore staffing and/or funding would not be accommodated by expected annual funding and would require the Seashore to readdress its ability to sustain current Seashore operations. Increases or decreases in staff and funding would be needed and/or other park programs would have to be substantially changed or eliminated.

Duration: *Short-term effects* would be 1 fiscal year.

Long-term effects would continue beyond 1 fiscal year indefinitely into the future.

Impacts of Alternative A (No-Action)

Under Alternative A, the three historic structures would remain at their current site and be maintained in good condition to the maximum extent possible by the park's Historic Preservation staff. Despite these efforts, the structures would continue to deteriorate, and their deterioration would be documented by the park's Maintenance and Cultural Resource Management staff. The NPS would consult with the SHPO to provide information on the buildings' deterioration and storm damage. Through consultation, the NPS

and SHPO would determine if and how the buildings should be repaired following each storm damage incident.

Dune rebuilding activities in a 0.3-mile stretch immediately east of the structures would be undertaken by the NPS as needed to protect the buildings. The park's Maintenance staff would consult with Natural Resource Management staff on the status of the dunes prior to reconstruction. The NPS would consult with North Carolina's Division of Coastal Management on dune rebuilding activities as needed.

In the event that a dune blow-out resulted in sand accumulation on the driveway serving the USLS Station and Boat House, the Seashore's Maintenance staff would perform the sand removal. In the event that a dune blow-out resulted in sand accumulation on NC 12, the NPS and NCDOT would confer on restoring vehicular passage on NC 12.

The Bodie Island District Law Enforcement operation would be permanently relocated to a nearby NPS site on Bodie Island, if and when deemed necessary to ensure continuity in emergency response services.

Overall, the short- and long-term impact on park operations would be moderate and adverse.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to park operations at and around the project area. Restoration of these three historic structures would not be undertaken. The Seashore's Historic Preservation staff would be reassigned to preservation activities on any of the Seashore's other 31 historic structures or projects. This would have a long-term, moderate, beneficial impact on park operations. Alternative A would contribute a noticeable, adverse increment to the cumulative impact on park operations.

Impacts of Alternative B (NPS Preferred Alternative)

Under Alternative B, the three historic structures would be relocated from their relatively secluded site to a more high-profile site. All of the project activities would be performed during daylight hours.

The NPS would develop press releases announcing the decision to relocate the buildings, anticipated project milestones, and regular project progress information. Visitors would be encouraged to visit the Seashore's website for regular updates on the project. This information would also be made available to various media outlets (e.g., television, newspaper, radio). Visitors would be permitted to observe the preparation and relocation from outside of the construction zones.

The USLS Station and Boat House would continue to serve the Bodie Island District Law Enforcement operations. The USCG Station would also be used to support park operations. The USCG Station would be relocated to a site immediately north of the Lighthouse Bay Drive, while the USLS Station and Boat House would be relocated to a site immediately south of the Lighthouse Bay Drive. This arrangement allows for safe and timely egress for Bodie Island District Law Enforcement from the USLS Station to NC 12.

A sign would be installed to direct visitors past the relocated Complex to the Bodie Island Lighthouse/Visitor Center.

The overall impact to park operations in the short-term would be moderate and adverse. In the long-term, the impact to park operations would be moderate and beneficial.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would contribute to cumulative impacts to park operations at and around the project area. Restoration of these three historic structures would be undertaken by the Seashore's Historic Preservation staff. This would have a long-term, minor, adverse impact on park operations. Alternative B would contribute a noticeable, beneficial increment to the cumulative impact on park operations.

CONCLUSION

Alternative A (No-Action)

Implementation of Alternative A (No-Action) would have a major, adverse impact (with respect to NEPA) and adverse effect (with respect to Section 106 of NHPA) on one, two, or all three historic structures. There would also be short- and long-term, minor to moderate, adverse impacts on geologic resources, soils, and park operations. There would be no impact on floodplains, vegetation, fire fuels, wildlife and wildlife habitat, or lightscapes. The cumulative impacts would range from none to long-term, major, and adverse.

Since the NPS preserves and protects a unique collection of USLS and USCG Stations at Cape Hatteras National Seashore and the 1879 USLS Station is the only remaining structure representative of the 1876 Carpenter Gothic style, irreparable damage to the 1879 USLS Station would constitute impairment of the Seashore's cultural resource integrity. Irreparable damage to the 1916 Boat House or 1925 USCG Station would not constitute impairment of the Seashore's cultural resource integrity because other examples of these construction periods and architectural styles occur on the Outer Banks.

Alternative B (NPS Preferred)

Implementation of Alternative B would result in short- and long-term, moderate, adverse impact (with respect to NEPA) and an adverse effect (with respect to Section 106 of NHPA) on all three historic structures. There would be short- and long-term, minor, beneficial impact on geologic resources because natural shoreline conditions would be restored and natural shoreline processes would continue to occur without interference. Short- and long-term, minor, beneficial impacts to fire fuel loads on Bodie Island would result from the establishment and maintenance of fire buffer zones surrounding the historic structures. Short- and long-term, negligible to moderate, adverse impacts on soils, floodplains, vegetation, wildlife and wildlife habitat, and lightscapes would result. Although there would be a short-term, moderate, adverse impact on park operations, the long-term impact would be major and beneficial. The cumulative impacts would range from long-term, moderate, and adverse to long-term, moderate, and beneficial.

Analysis of potential impacts of Alternative B did not identify any major adverse impacts to these resources. Therefore, implementation of Alternative B is not likely to result in impairment of any park resource or value.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 1: Summary of Environmental Consequences

Impact Topic	Alternative A (No-Action)	Alternative B (NPS Preferred)
Historic Structures	*NEPA:* Short- and long-term, major, adverse impact. Impairment of CAHA's cultural resources would result if the 1879 USLS Station was irreparably damaged. *Section 106:* Adverse effect. *Cumulative impact:* None	*NEPA:* Short- and long-term, moderate, adverse impact. Impairment of CAHA's cultural resources would result if the 1879 USLS Station was irreparably damaged. *Section 106:* Adverse effect. *Cumulative impact:* Would contribute a noticeable, adverse increment to the long-term, major, beneficial cumulative impact with respect to NEPA and no adverse effect with respect to Section 106.
Geologic Resources	*Overall impact:* Short- and long-term, minor, adverse impact. *Cumulative impact:* Would contribute a noticeable, adverse increment to the long-term, moderate, and adverse cumulative impact.	*Overall impact:* Short- and long-term, minor, beneficial impact. *Cumulative impact:* Would contribute a noticeable, adverse increment to the long-term, moderate, and adverse cumulative impact.
Soils	*Overall impact:* Short- and long-term, minor, adverse impact. *Cumulative impact:* Would contribute a noticeable, adverse increment to the long-term, moderate, and adverse cumulative impact.	*Overall impact:* Short-term, moderate, adverse impact. Long-term, minor, adverse impact. *Cumulative impact:* Would contribute an imperceptible, adverse increment to the long-term, moderate, and adverse cumulative impact.
Floodplains	*Overall impact:* None *Cumulative impact:* None	*Overall impact:* Short-term, moderate, adverse impact. Long-term, negligible, adverse impact. *Cumulative impact:* Would contribute an imperceptible, adverse increment to the long-term, moderate, and adverse cumulative impact.
Vegetation	*Overall impact:* None *Cumulative impact:* None	*Overall impact:* Short-term, minor, adverse impact. Long-term, negligible, adverse impact. *Cumulative impact:* Would contribute a noticeable, adverse increment to the long-term, moderate, and adverse cumulative impact.
Fire Fuels	*Overall impact:* None *Cumulative impact:* None	*Overall impact:* Short-term, minor, adverse impact. Long-term, negligible, adverse impact. *Cumulative impact:* Would contribute an appreciable, beneficial increment to the long-term, negligible, and beneficial cumulative impact.
Wildlife and Wildlife Habitat	*Overall impact:* None *Cumulative impact:* None	*Overall impact:* Short-term, minor, adverse impact. Long-term, negligible, adverse impact. *Cumulative impact:* Would contribute an imperceptible, adverse increment to the long-term, moderate, and adverse cumulative impact.
Lightscapes	*Overall impact:* None *Cumulative impact:* None	*Overall impact:* Long-term, minor, beneficial impact on the naturally dark beach setting; long-term, negligible, adverse impact on the existing naturally dark site. *Cumulative impact:* None
Park Operations	*Overall impact:* Short- and long-term, moderate, adverse impact. *Cumulative impact:* Would contribute a noticeable, adverse increment to the short- and long-term, moderate, beneficial cumulative impact.	*Overall impact:* Short-term, moderate, and adverse impact. Long-term, moderate, beneficial impact. *Cumulative impact:* Would contribute an noticeable, beneficial increment to the long-term, minor, adverse cumulative impact.

CHAPTER 5: CONSULTATION AND COORDINATION

NPS DO #12 requires the NPS to make diligent efforts to involve the interested and affected public in the NEPA process. This process, known as scoping, helps to determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. This chapter documents the scoping process for this project and includes the official list of recipients for the document.

PUBLIC SCOPING

Public scoping for the proposed action was facilitated through the NPS Planning, Environment, and Public Comment (PEPC) website. A brief project synopsis, including the purpose and need of the proposed action and alternatives descriptions, were posted on the website along with instructions for providing comments. The comment period was also announced via press release on the Seashore's website on January 11, 2007 and published in a newspaper articles in The News & Observer (January 26, 2007) and in The Virginian-Pilot (February 04, 2007). A 34-day public comment period was open from January 15, 2007 through February 17, 2007. A public scoping meeting was held on January 31, 2007 at the Wright Brothers National Monument in Kill Devil Hills, North Carolina.

A total of seven comment documents were received via PEPC, email, or U.S. mail regarding the proposed relocation of the Bodie Island USCG Station Complex. Of these, six were received during the public comment period (January 15, 2007 through February 17, 2007) and one correspondence was received 10 days after the close of the public comment period. Comments addressed the following topics:

- Support for preserving the historic structures by relocating them;
- Preference for the relocating the historic structures to Whalebone Junction intersection;
- Preference for the relocating the historic structures to the Lighthouse Bay Drive site;
- Support for restoration of the historic structures;
- Support for rehabilitation of the historic structures;
- Concern about historic structure restoration versus rehabilitation and associated impacts to the structures' integrity and character while modernizing them for contemporary use;
- Suggestion to open the historic structures to the public, as visitor contact stations or interpretive centers;
- Comment that current visitor contact station at Whalebone Junction Information Station is inadequate; and
- Suggestion for partnership opportunity with the North Carolina Scenic Byways Committee if the historic structures are to be used as interpretive purposes at the Whalebone Junction site.

INTERAGENCY COORDINATION

Other federal, state, and local governments and agencies contacted during the planning process. See Appendix A for copies of written correspondence with these agencies.

Scoping was initiated in 2004 by the staff of Cape Hatteras National Seashore and resource professionals of the NPS's Southeast Regional Office. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined what the likely issues and impact topics would be, and identified the relationship, if any, of the proposed action to other planning efforts at the Seashore. Since 2004, the NPS has identified numerous potential relocation sites and associated impacts to park resources, visitor use and enjoyment of the Seashore, and other impacts associated with relocation of these structures. The NPS has consulted with numerous other Federal, state and local agencies and stakeholders about this proposed action.

A coordination letter was submitted to the USFWS on February 6, 2007, requesting a current list of federally-protected endangered and threatened species, species of concern, or any other special status species, and/or designated critical habitat that might occur in the vicinity of the relocation sites for the proposed relocation of the Bodie Island USCG Complex. In their response letter, dated March 28, 2007, the USFWS determined that the relocation sites do not support any habitat that would directly affect any federally-listed species. A recommendation on lighting design and intensity was supplied. On July 31, 2008, the NPS emailed the USFWS to provide an updated project summary and request for confirmation that the proposed action would have no effect on any federally-protected species. On August 1, 2008, the USFWS confirmed that the proposed action, as described in this Environmental Assessment, would have no effect on any federally-protected species and that no additional consultation would be required.

A coordination letter was submitted to the North Carolina Department of Cultural Resources' State Historic Preservation Office and the North Carolina Department of Administration's State Environmental Review Clearinghouse on February 28, 2007. The State Environmental Review Clearinghouse assists state and federal government agencies in meeting their coordination requirements under the National Environmental Policy Act and serves as a means to notify potentially affected federal, state, and local agencies and the public of proposed development activities in their jurisdiction. The process is intended to provide decision makers with the information that would enable them to make an informed decision of the environmental consequences of a proposed action. NEPA documents submitted to the State Clearinghouse are listed in the North Carolina Environmental Bulletin, available on the Internet at http://www.doa.state.nc.us/clearing/ebulletin.aspx. Response letters from each of the state agencies are also included in this EA as Appendix A.

Representatives of the NPS, USACE, and the NCDCM visited the project area to identify wetlands under their respective jurisdiction and delineate wetlands as appropriate. NPS staff at Cape Hatteras National Seashore accompanied NPS staff from the Southeast Regional Office to delineate NPS wetlands in accordance with the NPS DO# 77-1 and its Procedural Manual. NPS staff at Cape Hatteras National Seashore accompanied the Field Representatives of the USACE and NCDCM. The NPS determined that the NPS wetlands had the same boundary as the USACE wetlands. The NPS submitted a request for Jurisdictional Determination to the USACE and received a "No Department of the Army Authorization Required" determination letter dated April 2, 2008. Since there would be no impact to NPS or USACE wetlands, a Statement of Findings for Wetlands is not required. The NPS received a letter, dated October 15, 2007, from the NCDCM stating that there are no coastal wetlands in the project area that would be impacted by the proposed action. Each of these letters is included in Appendix A.

The Division of Coastal Management (NCDCM) within the North Carolina Department of Environment and Natural Resources identified that a Federal Consistency Determination is required for the proposed action, and the Request for a Federal Consistency Determination is included in this EA as Appendix B.

This Request for a Federal Consistency Determination and a copy of this EA are to be submitted to the NCDCM for review and comment.

With regard to floodplains, the Division of Emergency Management within the North Carolina Department of Crime Control and Public Safety identified that the proposed action would occur within the 100-year floodplain and that the project is subject to Executive Order 11988 (Floodplain Management). The NPS meets the requirements of EO 11988 by generating a Statement of Findings for Floodplains, included in this EA as Appendix C.

Planning Team Participants

National Park Service

Outer Banks Group
(Cape Hatteras NS / Fort Raleigh NHS / Wright Brothers NMem)

Mike Murray	Superintendent
Darrell Echols	Deputy Superintendent
Steve Thompson	Special Park Uses and Lands
Thayer Broili	Chief of Resource Management
Doug Stover	Cultural Resource Manager
Meghan Carfioli	Natural Resource Manager
Tyler Bogardus	Biological Science Technician - Wildlife
Abra Zobel	Biological Science Technician - GIS
Charles Sellars	Chief of Maintenance and Facility Operations
John Wescott	Acting Chief of Maintenance and Facility Operations
Gregory Robinson	P.E./Public Health Specialist
Warren Wrenn	Safety Officer
Ellen Hand	Administrative Officer
Mary Doll	Chief of Interpretation
Norah Martinez	Chief Ranger of Protection and Visitor Services
Matt Callahan	Forestry Technician (Fire)
Jon Anglin	Bodie Island District Law Enforcement Ranger

Southeast Region

Bennie Keel	Acting Director, Southeast Archeological Center
Rich Sussman	Chief of Planning
Jami Hammond	Planning and Compliance Specialist
Anita Barnett	Planning and Compliance Specialist
Linda York	Acting Coastal Geology Coordinator
Cherry Green	Wetland Ecologist

Hartrampf, Inc.

Robert Bass	P.E., President and Structural Engineer
Jacqueline Renell	Historic Preservation
Larry Atkinson	Land Surveyor

Quible & Associates, P.C.

Brian Rubino	P.G.
Warren Eadus	P.G.

U.S. Army Corps of Engineers

Tom Steffens	Washington District Field Representative

North Carolina Department of Environment and Natural Resources, Division of Coastal Management

Steven Rynas	Federal Consistency Coordinator
John Cece	Dare County Field Representative

List of Preparers

Meghan Carfioli	NPS – Outer Banks Group, Natural Resource Manager
Doug Stover	NPS – Outer Banks Group, Cultural Resource Manager
Greg Robinson	NPS – Outer Banks Group, P.E./Public Health Specialist
Abra Zobel	NPS – Outer Banks Group, Biological Science Technician - GIS

List of Recipients

Elected Officials
Elizabeth Dole, U.S. Senator
Richard Burr, U.S. Senator
Marc Basnight, State Senator
Walter B. Jones, Congressman (R-NC 3rd)

Federal Agencies
Advisory Council on Historic Preservation
Federal Highways Administration
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Fish and Wildlife Service, Ecological Services, Raleigh Field Office

State and Local Government
North Carolina Department of Administration, State Environmental Review Clearinghouse

Organizations
National Parks Conservation Association
North Carolina Coastal Federation
Outer Banks Association of Realtors
Outer Banks Chamber of Commerce
Outer Banks Scenic Byway Committee
Outer Banks Visitors Bureau

Individuals/Organizations Who Requested a Copy

REFERENCES

ACRONYMS AND ABBREVIATIONS

ACHP – Advisory Council on Historic Preservation

ADA – Americans with Disabilities Act

AOE – Assessment of Effect

CAA – Clean Air Act

CAHA – Cape Hatteras National Seashore

CEQ – Council on Environmental Quality

Ch/hr – Chains per hour

DO – Director's Orders

EA – Environmental Assessment

EPA – Environmental Protection Agency

ft - feet

GMP – General Management Plan

MOA – Memorandum of Agreement

NC 12 – North Carolina Highway 12

NCDCM – North Carolina Division of Coastal Management

NCDOT – North Carolina Department of Transportation

National Register – National Register of Historic Places

NEPA – National Environmental Policy Act

NFPA – National Fire Protection Association

NHL- National Historic Landmark

NHPA – National Historic Preservation Act

NPS – National Park Service

SHPO – State Historic Preservation Officer

sq. ft. – Square Feet

USACE – United States Army Corps of Engineers

USCG – United States Coast Guard

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

USLS – United States Life-Saving

BIBLIOGRAPHY

American Bird Conservancy. 2007. Globally Important Bird Areas of the United States. Available on the Internet at http://www.abcbirds.org

Buie, J. C. 1996. Relative Risk Assessment for Cape Hatteras National Seashore. Center for Coastal Management and Policy, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA.

Douglas, B. C., M. S. Kearney, and S. P. Leatherman. 2001. Sea Level Rise: History and Consequences. San Diego: Academic Press. *As cited in* S.P. Leatherman and P.J. Kershaw, 2001. Sea Level Rise and Coastal Disasters: Summary of a Forum, October 25, 2001, Washington, DC. National Research Council of the National Academies. Available on the Internet at http://books.nap.edu/html/ndr/sea_level_rise.pdf

Fullerton, D.S., C. A. Bush, and J. N. Pennell. 2003. Map of surficial deposits and materials in the eastern and central United States (east of 102 degrees west longitude): U.S. Geological Survey, Geologic Investigations Series Map I-2789, scale 1:2500000. Available on the Internet at http://ngmdb.usgs.gov/ngm-bin/ILView.pl?sid=55297_1.sid&vtype=b&sfact=1.5

Google Earth. 2007. Available on the Internet at http://earth.google.com

Hartrampf and Quible & Associates, P.C. 2008. Natural Resource Assessment Report: Final Submittal, February 28, 2008, Relocate Bodie Island Life-Saving and Coast Guard Stations Environmental Assessment, PMIS #028585, Cape Hatteras National Seashore, Outer Banks, North Carolina.

Heiser, D. 1987. The Bodie Island Master Plan: A Site Analysis and Design Proposal for Visitor and Park Facilities. Unpublished manuscript. North Carolina State University. *In* J.K. Oppermann, 2005b, Cape Hatteras National Seashore: Bodie Island Life-Saving Station/Boat House Historic Structure Report.

National Park Service. 1984. Cape Hatteras National Seashore General Management Plan / Development Concept / Amended Environmental Assessment.

___. 1990. National Register Bulletin #15, How to Apply the National Register Criteria for Evaluation.

___. 1991. Secretary of the Interior Standards for Rehabilitating Historic Structures.

___. 1995. The Secretary of the Interior Standards for the Treatment of Historic Properties.

___. 1996. The Secretary of the Interior Standards for the Treatment of Historic Properties with Guideline for the Treatment of Cultural Landscapes.

___. 1998. Director's Order #28: Cultural Resource Management Guideline. Available on the Internet at http://www.cr.nps.gov/history/online_books/nps28/28contents.htm

___. 1999. Resource Management Plan.

___. 2001a. Director's Order #12: Conservation Planning, Environmental Analysis, and Decision-making. Available on the Internet at http://www.nps.gov/policy/DOrders/Dorders12.html

___. 2001b. NPS Outer Banks Group Fire Management Plan.

___. 2006a. National Park Service Management Policies 2006.

___. 2006b. Bodie Island Life-Saving Station: Relocation and Preservation Treatment.

___. 2006c. Bodie Island Coast Guard Station: Relocation and Stabilization.

___. 2008. National Register of Historic Places. Available on the Internet at http://www.nps.gov/history/nr

___. Harpers Ferry Center. 2007. National Park System. Available on the Internet at http://www.nps.gov/hfc/carto/nps-map-zoomify/nps-wall-map.html

___. Night Sky Team. 2007. Working NPS Outdoor Lighting Guidelines Zoning.

___. Southeast Archeological Center. 2007. April 18, 2007 Memo from Archeologist Charles Lawson, SEAC, Subject: Trip report on archeological survey prior to the relocation of historic structures in the Bodie Island Life-Saving Station, Bodie Island, North Carolina, Cape Hatteras National Seashore (SEAC Acc. 2114); and the archeological assessment of newly discovered earthworks on Roanoke Island, North Carolina, Fort Raleigh National Historic Site (SEAC Acc. 2130) April 9-13, 2007.

NCDENR. 1987. North Carolina Registry of Natural Heritage Areas: Letter of Intent and Agreement to Register and Protect a Natural Area.

NCDENR. 1999. The Laws and Rules for Sewage Treatment and Disposal Systems of the North Carolina Department of Environment and Natural Resources (15A NCAC 18A .1900). Available on the Internet at http://www.deh.enr.state.nc.us/osww_new/new1/images/Rules/99_law.pdf

NCDENR. 2008. North Carolina Coastal Stormwater Rule (15A NCAC 02H .1005). Available on the Internet at http://h2o.enr.state.nc.us/su/coastal.htm

NRCS. 2008. Web Soil Survey data for Dare County, North Carolina (NC055). Available on the Internet at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Oppermann, J. K. 2005a. Cape Hatteras National Seashore: Bodie Island Life-Saving Station/Boat House Historic Structure Report. Winston-Salem, N.C.

___. 2005b. Cape Hatteras National Seashore: Bodie Island United States Coast Guard Station Historic Structure Report. Winston-Salem, N.C.

Pendleton, E. A., E. R. Thieler, and S. J. Williams. 2005. Coastal Vulnerability Assessment of Cape Hatteras National Seashore (CAHA) to Sea-Level Rise. U.S. Geological Survey Open-File Report 2004-1064. Available on the Internet at http://pubs.usgs.gov/of/2004/1064/index.html

President of the United States. 1994. General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Available on the Internet at http://www.fs.fed.us/land/envjust.html

Riggs, S. R., D. V. Ames, S. J. Culver, D. J. Mallinson, D. R. Corbett, and J. P. Walsh. *In preparation*. In the eye of a human hurricane: Oregon Inlet, Pea Island, and the northern islands of the Outer Banks of North Carolina. East Carolina University, Greenville, N.C.

Schafale, M. P. and A. S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, Department of Environmental and Natural Resources. Raleigh, N.C.

Titus, J. G. and J. Wang. 2008. 1.1. Maps of Lands Close to Sea Level along the Middle Atlantic Coast of the United States: An Elevation Data Set to Use While Waiting for LIDAR. Available on the Internet at http://www.epa.gov/climatechange/effects/coastal/section1_1_may2008.pdf

U.S. Global Change Research Program (USGCRP), National Assessment Synthesis Team. 2001. Climate Change Impacts on The United States: The Potential Consequences of Climate Variability and Change. Cambridge University Press. *As cited* in S.P. Leatherman and P.J. Kershaw, 2001. Sea Level Rise and Coastal Disasters: Summary of a Forum, October 25, 2001, Washington, DC. National Research Council of the National Academies. Available on the Internet at http://books.nap.edu/html/ndr/sea_level_rise.pdf

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