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National Park Service  
U.S. Department of the Interior



Cape Hatteras National Seashore  
North Carolina

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# **Proposal to Facilitate Additional Public Beach Access**

## ***Environmental Assessment***



**June 2013**

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## **PUBLIC COMMENT**

Please submit your comments online at the NPS Planning, Environment, and Public Comment (PEPC) website at <http://parkplanning.nps.gov>.

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**Superintendent  
Cape Hatteras National Seashore  
1401 National Park Drive  
Manteo, NC 27954**

If you wish to be added to the park's mailing address for this and other announcements, please be sure to indicate that in your response.

**All comments must be received by August 2<sup>nd</sup>, 2013.**

Before including your address, telephone number, electronic mail address, or other personal identifying information in your comments, you should be aware that your entire comment (including your personal identifying information) may be made publicly available at any time. While you can ask us to withhold your personal identifying information from public review by checking the box "keep my contact information private," we cannot guarantee that we will be able to do so.

## **EXECUTIVE SUMMARY**

This environmental assessment evaluates the impacts of a NPS Cape Hatteras National Seashore proposal to develop 29 public access developments that include facilities evaluated in the Cape Hatteras National Seashore ORVMP/EIS and other facilities identified through agency and public scoping for this EA. The proposed action consists of 15 parking areas, 1 paved and 2 unpaved roads, 5 ORV ramps, 5 foot paths, 11 ADA accessible boardwalks, and the elevation of an existing flood-prone road section. The 29 developments would facilitate ORV and pedestrian access to areas of the Seashore open to ORVs; facilitate pedestrian access to areas of the Seashore closed to ORVs; facilitate access for visitors with disabilities; minimize conflicts between different types of recreation users; update facilities to accommodate visitor use; and improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists.

The alternatives evaluated in this environmental assessment include one action alternative and a no action alternative that would not implement the proposed action of constructing the 29 proposed developments to facilitate visitor access on the Seashore. The action alternative was designed to meet the following park objectives:

- Facilitate visitor access along the Seashore;
- Provide a variety of visitor use experiences;
- Provide a satisfying visitor experience throughout the Seashore for all visitors that is consistent with the purpose for which the park was established;
- Ensure that future and current roads, ORV ramps, foot trails, boardwalks, and parking areas promote the safety of all visitors;
- Minimize conflicts between different types of recreation users;
- Protect the Seashore's natural, cultural, scenic, and aesthetic values; and
- Work cooperatively with local communities and other government agencies to address mutual concerns.

Evaluation of the potential effects of the proposed action showed that impacts to geology, soils, topography, water quality, wetlands, floodplains, vegetation, wildlife, protected and rare plants and animal species, and human health and safety would be negligible to moderate adverse. Beneficial impacts would occur to floodplains, visitor use and experience, and human health and safety. Neither of the alternatives analyzed in this EA would result in major impacts to the environment of the Cape Hatteras National Seashore.

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## ACRONYMS AND ABBREVIATIONS

AEC	Area of Environmental Concern
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Accessibility Guidelines
CAA	Clean Air Act
CAMA	Coastal Area Management Act
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Assessment
FHWA	Federal Highway Administration
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NCDCCPS	North Carolina Department of Crime Control and Public Safety
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
NCNHP	North Carolina Natural Heritage Program
NCWRC	North Carolina Wildlife Resources Commission
NPOMA	National Parks Omnibus Management Act
NPS	National Park Service
ORV	off-road vehicle
ORVMP	Off-road Vehicle Management Plan
OSHA	Occupational Safety and Health Administration
ROD	Record of Decision
SNHA	Significant Natural Heritage Areas
SOF	Statement of Findings
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VFA	Vehicle Free Area

# CHAPTER 1: PURPOSE AND NEED FOR ACTION

## INTRODUCTION

Officially authorized in 1937 along the Outer Banks of North Carolina, Cape Hatteras National Seashore (Seashore) is the nation's first national seashore encompassing approximately 67<sup>1</sup> miles of shoreline. The Seashore was established by Congress for the enjoyment and benefit of the people, and to preserve more than 30,000 acres of dynamic barrier island habitat. The Outer Banks of North Carolina formed as a result of changes in sea level, wave and wind action, and ocean currents. These factors continue to influence the islands today through erosion and accretion of the shoreline; overwash across the islands; and the formation, migration, and closure of the inlets (NPS 1979). Since the 1930s, these natural processes have been influenced by human actions such as building sand berms to protect roads and homes, dredging inlets, and filling inlets opened by storms (NPS 2010).

The Seashore serves as a popular recreation destination with 1,960,711 annual visitors in 2011 (NPS 2012a). Seashore visitors participate in various recreational activities, including beach recreation (sunbathing, swimming, shell collecting, etc.), fishing (surf and boat), hiking, hunting, motorized and non-motorized boating, nature study, photography, off-road vehicle (ORV) use (beach driving), shell fishing, sightseeing, watersports (surfing, windsurfing, kiteboarding, etc.), and wildlife viewing. Seashore visitors use ORVs for traveling to and from recreational areas and for pleasure driving (NPS 2010).

In addition to a multitude of visitor opportunities, the Seashore provides a variety of important habitats, including habitats for the federally listed piping plover, sea turtles, and one plant species, the seabeach amaranth. The Seashore contains ecologically important habitats such as marshes, tidal flats, and riparian areas, and hosts various species of concern such as colonial waterbirds (least terns, common terns, and black skimmers), American oystercatcher, Wilson's plover, and gull-billed tern which are listed by the State of North Carolina as either threatened or a species of special concern. Unfortunately, the Seashore has experienced significant declines in most beach nesting bird populations since the 1990s (NPS 2010).

Historically, beach driving at the Seashore was for the purpose of transportation and not recreation, and was managed through various draft or proposed plans, though none were ever finalized or published as a special regulation as required by Executive Orders 11644 and 11989 and 36 Code of Federal Regulations 4.10 until 2010. Large-scale planning documents have been developed related to the management of ORVs and protected species and habitats at the seashore, such as an interim plan developed in 2006, a draft long-term Off-road Vehicle Management Plan (ORVMP)/ Environmental

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<sup>1</sup> Due to the dynamic nature of the barrier island system, the mileage of shoreline in the Seashore is constantly changing. This mileage estimate includes ocean shoreline and some interdunal roads managed for public recreation by the NPS. Actual on-the-ground mileage may vary, especially around the inlets and spits, due to the increased potential for erosion and accretion in these areas.

Impact Statement (EIS) completed March 2010 and a final ORVMP/EIS completed in December 2010 (NPS 2010). The ORVMP closed portion of the beach to ORV driving and identified numerous construction projects that would facilitate visitor access to key recreational areas within the seashore. These projects relate to development of parking areas, unpaved roads and ramps, and Americans with Disability Act (ADA) accessible boardwalks (NPS 2010).

This Environmental Assessment (EA) evaluates the potential environmental impacts of constructing 29 proposed public access facilities (also known as the 'proposed action') related to facilitating visitor access on the Cape Hatteras National Seashore. This EA does not revisit ORV regulations and procedures evaluated in the Final Cape Hatteras National Seashore ORVMP/EIS including ORV use/access on ORV routes throughout the Seashore. This EA has been prepared in accordance with the following requirements:

- The National Environmental Policy Act (NEPA) of 1969, which requires an environmental analysis for Federal projects that may potentially impact the quality of the human environment.
- Council of Environmental Quality (CEQ) Regulations at 40 Code of Federal Regulations (CFR) 1500-1508, which specify in detail the requirements of NEPA for Federal agencies.
- National Park Service Conservation Planning, Environmental Impact Analysis, and Decision Making; Director's Order (DO) #12 and NEPA Handbook.
- The CEQ Regulations and NPS DO#12 guide officials in the decision-making process with respect to major Federal actions, and include requirements to provide a forum for the general public as it relates to proposed alternatives. NEPA studies focus on analyzing the impacts of particular courses of action faced by park officials. In the case of this Environmental Assessment, there are three primary purposes:
  - To help determine whether the proposed alternative would have a significant impact on the environment, requiring an EIS.
  - To aid in compliance with NEPA when an EIS is not required.
  - To facilitate the preparation of an EIS if one is required.
- As a National Park Service Unit, Cape Hatteras National Seashore is guided by requirements set forth in the 1916 Organic Act, which directs the National Park Service to "conserve the scenery, natural processes, historic objects, and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as would leave them unimpaired for the enjoyment of future generations" (16 USC, sec.1, et. seq.). Additionally, guiding legislation for National Park Service officials include the Coastal Zone Management Act (CZMA), Clean Water Act (CWA), the Endangered Species Act (ESA), and the National Park Service Omnibus Management Act of 1998, the latter of which supports the incorporation of scientific analysis and methodology into the decision-making process for federally proposed actions.

## **PURPOSE OF THE PROPOSED ACTION**

The purpose of the proposed action (also referred to as the 'preferred alternative') is to develop a set of public access facilities including those evaluated in the Cape Hatteras National Seashore ORVMP/EIS and other facilities identified in the agency and public scoping process for this EA. The developments would facilitate visitor access to key recreational areas within the seashore to provide a variety of visitor use experiences while minimizing conflicts among various users. The proposed action includes constructing 29 facilities consisting of parking areas, paved and unpaved roads and ORV ramps, foot paths, ADA accessible boardwalks, and elevating a section of an existing road. The goals of the proposed action are as follows:

- Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs;
- Facilitate pedestrian access to areas of the Seashore closed to ORVs;
- Facilitate visitor access for visitors with disabilities;
- Minimize conflicts between different types of recreation users;
- Update facilities (e.g. parking area) to accommodate visitor use; and
- Improve safety conditions along NC-12, other roads, beaches, and parking areas for all users.

## **NEED FOR THE PROPOSED ACTION**

Cape Hatteras National Seashore provides a variety of visitor experiences including auto touring, biking bird watching, boating, camping, fishing, hiking, hunting, kayaking, taking nature walks, horseback riding, stargazing, swimming, wildlife viewing, surfing, kite boarding, and wind surfing. It is a long, linear park, visitation is high, and parking spaces near roads are limited. Some popular beach sites, particularly those near the inlets and Cape Point, are a distance from established or possible parking spaces. Visitors who come for some popular recreational activities such as surf fishing and picnicking are accustomed to using large amounts of recreational equipment that cannot practically be hauled over these distances without some form of motorized access. For many visitors, the time needed and the physical challenge of hiking to the distant sites, or for some even to close sites, can discourage or preclude access by non-motorized means. As a result, ORVs have long served as a primary form of access from many portions of the beach in the Seashore, and continue to be the most practical available means of access and parking for many visitors (NPS 2010).

With the implementation of the 2010 ORVMP, seasonal and year-round ORV routes as well as Vehicle Free Areas (VFAs) were designated along the Seashore. Areas of beaches once opened to ORVs are now closed seasonally or permanently, while other areas remain open year-round. In addition, NPS can close areas of the beach temporarily due to a natural resource concern.

Beach areas closed permanently or seasonally to ORVs can still be accessed by pedestrians, though many of these areas are difficult to access by foot from current ORV ramps, boardwalks, and foot paths. Other areas of the Seashore opened to ORVs

year-round cannot be accessed by ORVs or have one access point, causing vehicles to turn around on the beach. Having one access location for an ORV route may increase overcrowding or unsafe conditions. In order to facilitate visitor use throughout the Seashore, NPS needs to provide access locations to ORV routes.

In addition, several areas on the Seashore experience high use and current infrastructure does not accommodate the conflicting types of recreational use common on the Seashore. Safety and traffic issues have also arisen at several locations throughout the Seashore. In order to provide a range of recreational opportunities, the 2010 ORVMP plan identified several projects that could be implemented to facilitate pedestrian and ORV use throughout the Seashore. The ORVMP plan identified that the addition of new parking areas with associated foot trails or boardwalks were required to facilitate pedestrian access at a number of locations. Also in the ORVMP was a provision for accessibility for visitors with disabilities. During internal and public scoping period, the public and NPS raised safety and overcrowding concerns at several locations not identified in the ORVMP plan. Each development proposed to facilitate visitor access has an individual need that relates to the existing conditions at each project location or problems that need to be remedied, explaining why the park must take action at this time and in this place. Table 1-1 lists the purpose and need for the 29 individual proposed facilities.

**Table 1-1 Purpose and Need for the Individual Public Access Facilities**

No.	Project	Purpose	Need
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Update facilities to accommodate visitor use</li> </ul>	<ul style="list-style-type: none"> <li>Beach between Ramp 1 to 0.5 miles south of Coquina Beach is a VFA</li> <li>Seashore visitors currently use area as a parking area</li> </ul>
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island*	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> <li>Update facilities to accommodate visitor use</li> </ul>	<ul style="list-style-type: none"> <li>Beach between Ramp 1 to 0.5 miles south of Coquina Beach is a VFA</li> <li>Current ADA accessible boardwalk does not extend to the beach</li> </ul>
3	Additional access road from NC-12 to fee station at Coquina Beach	<ul style="list-style-type: none"> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> <li>Minimize conflicts between different types of recreation users</li> </ul>	<ul style="list-style-type: none"> <li>Conflict between visitors using the beach and visitors who are obtaining their ORV permits</li> </ul>
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)*	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>Beach at this location is difficult to access by foot</li> <li>Year-round ORV route from 0.5 mile south of Coquina Beach to 0.2 miles south of ramp 4 has one ORV access location at ramp 4</li> </ul>
5	A 10-car parking area with foot trail to Bodie Island Spit at Ramp 4*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>Seasonal ORV route from ramp 4 to Oregon Inlet.</li> <li>Beach seasonally closed to ORV route at this location is difficult to access by foot.</li> </ul>
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (Salvo)	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>Beach directly north of Ramp 23 is seasonally closed to ORVs (Rodanthe, Waves, and Salvo);</li> <li>Seasonal ORV route from Ramp 23 to 1.5 miles south of ramp 23</li> <li>Beach at this location is difficult to access by foot</li> </ul>
7	A 10-car parking area* about 1.0 mile south of Ramp 23 with foot trail to the beach	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>Beach at this location is a VFA and this area is difficult to access by foot</li> </ul>
8	An ORV Ramp 25.5 with foot trail or boardwalk to	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>Beach at this location is difficult to access by foot</li> <li>Provides access to year-round</li> </ul>

No.	Project	Purpose	Need
	the beach*	<ul style="list-style-type: none"> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>ORV route from 1.5 miles south of ramp 23 to ramp 27</li> </ul>
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>Beach between ramp 27 and ramp 30 is permanently closed to ORVs year-round</li> <li>Beach at this location is difficult to access by foot</li> <li>Visitors park along NC-12 to access beach</li> </ul>
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area* and foot trail to the beach	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>End of year-round ORV route from ramp 30 to 2.5 miles south</li> <li>VFA from ramp 34 to 1.5 miles north</li> <li>Beach at this location is difficult to access by foot</li> </ul>
11	A handicap accessible boardwalk at Ramp 34	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA from ramp 34 to 1.5 miles north</li> <li>Seasonal ORV route from ramp 34 to ramp 38 (Avon)</li> <li>Beach at this location is difficult to access by foot</li> </ul>
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>Popular area with no ADA accessible boardwalk</li> </ul>
13	A 15-car parking area west side of highway at/near Kite Point*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Update facilities (e.g. parking areas) to accommodate visitor use</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>VFA on beach from 1.5 miles south of ramp 38 (i.e., Haulover) to 0.4 mile north of ramp 43 (includes Buxton)</li> <li>Popular area for soundside access</li> <li>Overcrowding conditions</li> <li>Currently visitors park along NC-1</li> </ul>
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for</li> </ul>	<ul style="list-style-type: none"> <li>VFA on beach from 1.5 miles south of ramp 38 (i.e., Haulover) to 0.4 mile north of ramp 43 (includes Buxton)</li> <li>Beach at this location is difficult to access by foot</li> </ul>

No.	Project	Purpose	Need
	<i>(Changed from 10 to 15 car parking area after scoping)</i>	<ul style="list-style-type: none"> <li>pedestrians and motorists</li> <li>Update facilities (e.g. parking areas) to accommodate visitor use</li> </ul>	<ul style="list-style-type: none"> <li>Visitors are currently parking along NC-12</li> </ul>
15	A 5-car parking area west side of highway at/near soundside access 60*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Update facilities (e.g. parking areas) to accommodate visitor use</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>VFA on beach from 1.5 miles south of ramp 38 (i.e., Haulover) to 0.4 mile north of ramp 43 (includes Buxton)</li> <li>Beach at this location is difficult to access by foot</li> <li>Popular area for soundside access</li> <li>Currently visitors park along NC-12</li> </ul>
16	A 50-car parking area at the former Buxton Coast Guard Station* with handicap accessible boardwalk	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Update facilities to accommodate visitor use</li> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA on beach from 1.5 miles south of ramp 38 (i.e., Haulover) to 0.4 mile north of ramp 43 (includes Buxton)</li> <li>Overcrowding conditions</li> <li>Conflict between visitors of the Cape Hatteras Light house and beach visitors</li> </ul>
17	A handicap accessible boardwalk at Lighthouse Beach	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>Popular area with no ADA accessible boardwalk</li> </ul>
18	A 3-car parking area at Loran Road* w/ new handicap accessible boardwalk to the beach	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Update facilities (e.g. parking areas) to accommodate visitor use</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA on beach from 1.5 miles south of ramp 38 (i.e., Haulover) to 0.4 mile north of ramp 43 (includes Buxton)</li> </ul>
19	An elevated section of Lighthouse Rd to address flooding at ramps 43 and 44	<ul style="list-style-type: none"> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>Paved road becomes frequently flooded</li> <li>Unsafe conditions</li> </ul>
20	An unpaved IDR between Ramp 45 and 49 w/new	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>The beach is a VFA from 1.7 miles west of ramp 45 to the east of Frisco boundary at the</li> </ul>

No.	Project	Purpose	Need
	ORV Ramp 48 to the beach* (Ramp has been moved from 47.5 to 48)	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> </ul>	<ul style="list-style-type: none"> <li>new proposed Ramp 48</li> <li>Area of beach difficult to access by foot</li> </ul>
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	<ul style="list-style-type: none"> <li>Update facilities (e.g. parking areas) to accommodate visitor use</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas for pedestrians and motorists</li> <li>Minimize conflicts between different types of recreation users</li> </ul>	<ul style="list-style-type: none"> <li>Overcrowding conditions</li> <li>Unsafe beach exiting and entering</li> <li>Popular beach location</li> </ul>
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>Popular area with no ADA accessible boardwalk</li> </ul>
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>Seasonal ORV route from Spur Road to Hatteras Inlet</li> </ul>
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA from Ocracoke Island Ferry North Comfort Station to 0.5 mile southwest of ramp 59</li> </ul>
25	An ORV Ramp 59.5 at north Ocracoke*	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> </ul>	<ul style="list-style-type: none"> <li>The beach is a VFA from the old Ramp 59 to the Ocracoke Island Ferry Station.</li> <li>No access to year-round ORV route starts 0.5 miles southwest of ramp 59.5 to new ramp 63</li> </ul>
26	A 5-car parking area at the west side of highway entrance of Borrow Pit Road*	<ul style="list-style-type: none"> <li>Facilitate pedestrian access to areas of the Seashore closed to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas</li> </ul>	<ul style="list-style-type: none"> <li>Location on beach is difficult to access by foot</li> </ul>
27	An ORV Ramp 63 across from Scrag Cedar Road*	<ul style="list-style-type: none"> <li>Facilitate ORV and pedestrian access to areas of the Seashore open to ORVs</li> <li>Improve safety conditions along NC-12, other roads, beaches, and parking areas</li> </ul>	<ul style="list-style-type: none"> <li>No access to year-round ORV route starts 0.5 miles southwest of ramp 59.5 to new ramp 63</li> </ul>

No.	Project	Purpose	Need
28	A handicap accessible boardwalk at the Ocracoke Pony Pens*	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA at Pony Pens Beach</li> </ul>
29	A handicap accessible boardwalk at the Ocracoke Day Use Area*	<ul style="list-style-type: none"> <li>Facilitate accessibility for visitors with disabilities</li> </ul>	<ul style="list-style-type: none"> <li>VFA at Ocracoke Day Use Area</li> </ul>

\*Projects identified in the ORVMP/FEIS

## **OBJECTIVES IN TAKING ACTION**

Objectives are what must be achieved for the action to be considered a success. All alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action. Objectives must be grounded in the Seashore's enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided by the Seashore's general management plan, strategic plan, and/or other management guidance. For the proposed action to be considered successful, the following objectives must be met:

- Facilitate visitor access along the Seashore;
- Provide a variety of visitor use experiences;
- Provide a satisfying visitor experience throughout the Seashore for all visitors that is consistent with the purpose for which the park was established;
- Ensure that future and current roads, ORV ramps, foot trails, boardwalks, and parking areas promote the safety of all visitors;
- Minimize conflicts between different types of recreation users;
- Protect the Seashore's natural, cultural, scenic, and aesthetic values; and
- Work cooperatively with local communities and other government agencies to address mutual concerns.

## **PROPOSED ACTION STUDY AREA**

The geographic study area for this EA is Cape Hatteras National Seashore in North Carolina (Figure 1.1), unless otherwise noted under each resource topic. The Seashore encompasses 24,470 acres of land. Impacts associated with the beach due to implementing the ORVMP routes, regulations, and construction projects were analyzed in the FEIS. The study area of this EA focuses on the area behind the dunes and on the soundside. The 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. The islands constitute a narrow barrier island chain that is typically less than one mile wide. The barrier islands are bordered on the west by the Pamlico Sound, which forms the largest estuarine system on the East Coast, and on the east by the Atlantic Ocean.

## **PURPOSE AND SIGNIFICANCE OF THE NATIONAL SEASHORE**

All units of the national park system were formed for a specific purpose (the reason they are significant) and to conserve significant resources or values for the enjoyment of future generations. The purpose and significance of the park provides the basis for identifying uses and values that individual NPS plans will support. The following provides background on the purpose and significance of the Seashore. As states in the Seashore's enabling legislation (the Act), Congress authorized the Seashore in 1937 as a national seashore for the enjoyment and benefit of the people, and to preserve the area. The Act states:

*Except for certain portions of the area, deemed to be especially adaptable for recreational uses, particularly swimming, boating, sailing, fishing, and other recreational activities of similar nature, which shall be developed for such uses as needed, the said areas 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.*

The Act also states:

*...when title to all the lands, except those within the limits of established villages, within boundaries to be designated by the Secretary of Interior within the area of approximately one hundred square miles on the islands of Chicamacomico [Hatteras], Ocracoke, Bodie, Roanoke, and Collington, and the waters and the lands beneath the waters adjacent there to shall have been vested in the United States, said areas shall be, and is hereby, established, dedicated, and set apart as a national seashore for the benefit and enjoyment of the people and shall be known as the Cape Hatteras National Seashore.*

A 1940 amendment to the enabling legislation authorized hunting and re-designated the area as the Cape Hatteras National Seashore Recreational Area. Park significance statements capture the essence of the park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to the park's purpose. The following significance statements recognize the important features of the Seashore. As stated in the 2006–2011 Strategic Plan, the Seashore has the following significance (NPS 2007a):

*This dynamic coastal barrier island system continually changes in response to natural forces of wind and wave. The flora and fauna that are found in a variety of habitats at the park include migratory birds and several threatened and endangered species. The islands are rich with maritime history of humankind's attempt to survive at the edge of the sea, and with accounts of dangerous storms, shipwrecks, and valiant rescue efforts. Today, the Seashore provides unparalleled opportunities for millions to enjoy recreational pursuits in a unique natural seashore setting and to learn of the nation's unique maritime heritage.*



**Figure 1-1 Project Area and Vicinity of Cape Hatteras National Seashore.**

## PROJECT BACKGROUND

In January 2012, NPS published the Special Regulations, Areas of the National Park System, Cape Hatteras National Seashore Off-Road Vehicle (ORV) Management Final Rule. This rule designates ORV routes and authorizes limited ORV use within the Seashore in a manner that will protect and preserve natural and cultural resources, provide a variety of safe visitor experiences, and minimize conflicts among various users. Under the NPS general regulations, the operation of motor vehicles off of roads within areas of the National Park System is prohibited unless authorized by special regulation.

The final rule implements portions of the Cape Hatteras National Seashore Off-Road Vehicle Management Plan (ORVMP) Final EIS (FEIS) and Record of Decision (ROD), and is a major Federal action significantly affecting the quality of the human environment. In accordance with the National Environmental Policy Act, NPS prepared a Draft and Final ORVMP/EIS. The Draft EIS (DEIS) was released to the public on March 5, 2010, and a 60-day public comment period followed beginning on March 12, 2010. The FEIS was released on November 15, 2010. This FEIS evaluated six alternatives for managing off-road motorized vehicle access and use at the Seashore, including two no-action alternatives. The ROD, which selected Alternative F, was signed on December 20, 2010, and a notice of the decision was published in the Federal Register on December 28, 2010. The purpose of the proposed action is to implement the Selected Action as described in the ROD. A full description of the alternatives that were considered, the environmental impacts associated with the project, and public involvement is contained in the FEIS available online at: <http://www.parkplanning.nps.gov/caha>. This rule became effective on February 15, 2010 (NPS 2012b).

The ORVMP identified construction projects that would facilitate visitor access to key recreational areas within the Seashore. These projects relate to development of parking areas, unpaved roads and ramps, and Americans with Disabilities Act (ADA) accessible boardwalks. These construction projects and general locations were selected because of their location on the Seashore in relation to open or closed ORV routes. To determine more specific locations for each proposed facility the following surveys were conducted:

- Wetland delineations were conducted on 28 of the 29 project locations in 2012 between July 16<sup>th</sup> and July 21<sup>st</sup> and on October 28<sup>th</sup> according to the Corps' 1987 Wetland Delineation Manual. The footprint for the proposed 50-car parking area and handicap accessible board walk at former Buxton Coast Guard Station was not surveyed because this area has been heavily disturbed and the Coast Guard was in the process of removing their facilities. The dunes in this area were recently reconstructed and re-vegetated.
- Vegetation surveys for listed federal and state listed vascular plant species were conducted in the summer of 2012 between June 14<sup>th</sup> to June 18<sup>th</sup>; July 14<sup>th</sup> to July 19<sup>th</sup>; and August 19<sup>th</sup> to August 23<sup>rd</sup>. The footprint for the proposed 50-car parking area and handicap accessible board walk at former Buxton Coast Guard Station was

not survey because this area has been heavily disturbed and the Coast Guard was in the process of removing their facilities. The dunes in this area were recently reconstructed and re-vegetated.

- Archeological Surveys were conducted between January 7 and January 10, 2013 at proposed beach access ramps, parking areas, and the interdunal road. Archeological surveys were not conducted at a proposed site if:
  - Ground disturbing activities are not proposed for the site,
  - It was determined by the archaeologist that the area had been previously disturbed by humans (e.g. human created duneline), and
  - The site was in a wetland with standing water.

During the internal and public scoping process for this EA, several other construction projects that would facilitate visitor access to key recreational areas within the seashore were brought to the attention of NPS and are included in the proposed action. In addition, due to the dynamic nature of the Seashore, not all of the facilities included in the ORVMP/EIS are being proposed. Facility locations have changed from recent storm events and some projects are no longer feasible.

This EA evaluates the potential environmental impacts of constructing the proposed 29 developments to facilitate visitor access to key recreational areas within the Seashore. This EA does not revisit ORV regulations and procedures evaluated in the Final Cape Hatteras National Seashore ORVMP/EIS including ORV use/access on ORV routes throughout the Seashore.

## **SCOPING PROCESS AND PUBLIC PARTICIPATION**

CEQ requires agencies to make “diligent” efforts to involve the interested and affected public in the NEPA process (40 CFR 1506.6), regardless of the level of impact or documentation. The extent of the public involvement will change depending on the degree of impact and interest in the proposal. Agencies must also “encourage and facilitate public involvement in decisions which affect the quality of the human environment” (40 CFR 1500.2 (d)). 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; and
- Define purpose and need, agency objectives and constraints, and the range of alternatives.

A project kickoff meeting and project site visit was conducted from January 10<sup>th</sup> to January 12<sup>th</sup>, 2012. The meeting was attended by several key Park staff members and provided an opportunity for scoping and further refinement of the proposed action and alternative.

Public scoping for the proposed action was first facilitated during the Draft ORVMP/EIS and interested individuals or government officials were given an opportunity to comment on the proposed developments listed in the ORVMP/EIS through the NPS Planning, Environment, and Public Comment website between March 12, 2010 and May 11, 2010.

A second opportunity to comment on the proposed developments listed in the ORVMP/EIS as well as on additional developments identified during internal scoping was provided through the NPS Planning, Environment, and Public Comment website. A brief project synopsis, including the proposed facilities and alternatives were posted on the website along with instructions for providing comments. The comment period extended from March 1 through March 31, 2012. 192 comments were received through the Planning, Environment, and Public comment website. A summary of the concern in those comments are outlined in Appendix A.

In addition to comments from the general public, comments were also received from the Southern Environmental Law Center and the Hatteras Island Genealogical and Preservation Society. Regardless of how a specific comment was submitted or received, all comments were given equal consideration in the scoping process. Important issues relevant to the proposed action were identified by input from the general public and agency officials.

Key issues included:

**Design concerns:** Several comments received indicated a desire for changes in a proposed project's design, including using pervious material and going up and over dunes.

**Additional amenities:** Several comments received indicated a desire for tire inflation stations, signs, and bathhouses near existing and proposed ramps, parking areas, or boardwalks.

**Priority:** Many comments received indicated a need for prioritizing the proposed projects. Many comments suggested how the proposed projects should be prioritized.  
**Public Safety:** Several comments received were concerned about public safety issues with current conditions on the seashore. Other comments expressed concern about public safety from implementing the proposed projects and/or the design of the proposed projects.

**New Alternatives or Elements:** Many of the comments expressed the desire/need for expanding/increasing elements (parking areas, ADA accessible boardwalks, ORV ramps, or foot trails) to some of the projects or a desire/need for additional projects (Parking areas, ADA accessible boardwalks, ORVE ramps, or foot trails) on the National Seashore. In particular, comments were received expressing a need for the following project that was not identified in the ORVMP/EIS or during internal scoping: A relocation of soundside access north of access 53, which currently goes by Little Kinnakeet, to separate recreational users from the Little Kinnakeet visitors.

**Cost:** Several comments received expressed a concern about the cost of implementing and maintaining the projects on the National Seashore as well as charging permit fees before the projects are in place.

**Eliminating projects:** Several comments received indicated a desire for certain projects, elements of projects, or types of projects to be removed from the list of proposed projects because they did not see a need for these projects.

**Accessibility:** General comments the commenter wants the park to be aware of including handicap access issues and accessibility of sites.

**Visual Quality:** Several comments received indicated a concern that the natural beauty of the National Seashore would be impacted by implementing these projects.

**Sustainability:** Several comments were concerned with implementing the proposed projects when the coastal environment of the seashore is always changing.

**Wildlife Concerns:** Several comments were concerned about the impact these proposed projects would have on wildlife species within the park.

**Schedule:** Several comments requested a timeline for the proposed projects. Commenters want to know when the proposed projects will be implemented.



## **ISSUES AND IMPACTS EVALUATED IN DETAIL IN THIS EA**

To focus this EA, the NPS selected specific issues for further analysis and eliminated others from evaluation. Issues selected for analysis in this EA were determined through internal and public scoping.

### **Geology, Topography, and Soils**

Activities associated with the proposed action would disturb coastal processes that move sand around the barrier island system. The proposed ORV ramps would impact the build-up of sand at dunes, and the vegetation that holds sand in place on the islands.

### **Vegetation including Invasive Species**

Activities associated with the proposed action would remove vegetation. Vegetation that could be impacted from the proposed facilities includes vegetation near dunes, which functions to trap sand and facilitate natural dune building processes. Many of these projects are located on dunes or on the soundside area of the Seashore. Construction related activities could potentially bring non-native species to the Seashore, though only a small number of non-native species can live in the salt and wind of the seashore environment.

### **Water Quality / Marine and Estuarine Resources**

Construction and operation of new ramps, parking areas, boardwalks, and trails have the potential to affect the water quality of nearby aquatic environments through disturbance and runoff of soils or by incidental leaks or accidental spills of petroleum products used in vehicles and equipment.

### **Floodplains and Wetlands**

Floodplains and wetlands were evaluated in the 2010 Cape Hatteras ORVMP EIS. In the EIS, NPS assumed that all of the facilities would be located exclusively in upland areas, thereby avoiding impacts to wetlands. Protective signage would be installed at all soundside access points to reduce the potential for resource damage from ORV use. The EIS analysis is incorporated by reference here.

Impacts to floodplains and wetlands were further evaluated in this EA to ensure the more detailed footprints and designs are consistent with the EIS findings. Vegetated wetlands along the soundside and interior of the islands are susceptible to direct damage from the proposed facilities, and are discussed further under the “Wetlands and Floodplains” impact topic. Many of the proposed facilities are located near wetlands areas that are often not noticeable to visitors. When standing water is present along these areas, visitors often drive over adjacent vegetated areas in an attempt to avoid the standing water. This results in wider roads, new vehicle routes, and crushed or dead vegetation. Construction of new parking areas is also of concern for wetlands that may

be located nearby. A wetland delineation report was developed for each of the proposed construction sites.

Nearly all of the Seashore is located within the 100-year floodplain, with the exception of a small area to the Navy tower site on Bodie Island and larger areas around Buxton. Developments, such as constructing new parking areas or expanding parking areas have the potential to impact the function and value of the floodplains, which primarily function by providing lowland areas for floodwater storage and conveyance. In contrast, floodplains at the Seashore are subject to coastal flooding caused by storm systems that can raise water levels substantially via storm surge. Floodplains are discussed further under the “Wetlands and Floodplains” impact topic.

### **State-listed and Special Status Species**

The ORVMP EIS addressed the habitat, diet, reproduction, population trends, and impacts on several species of shorebirds that are listed or recognized as special status species by the State of North Carolina but are not federally listed as endangered or threatened. However, the EIS did not address state-listed plant species. Habitat for state-listed special status species may be vulnerable to disturbances caused by the 29 proposed facilities. Federal Species of Concern (SOC) and state-listed significantly rare species that potentially occur in the proposed action corridor are vegetative species. A plant species survey was conducted in the summer of 2012 to identify Federal and state listed vascular plant species within and adjacent to the footprints of each of the 29 proposed facilities. The following state listed species were encountered during these surveys: *Dichanthelium caerulescens*, *Ipomoea imperati*, *Trichostema* sp., and *Yucca gloriosa*.

### **Wildlife and Wildlife Habitat**

The wildlife impacts analysis in the ORVMP EIS focused on wildlife species inhabiting beach, primary dune, and sandy spit habitats. Wildlife was further evaluated in detail in the EA due to the likely effects of implementing the developments on wildlife species and their associated habitats that are located behind the sand dunes and on the soundside of the National Seashore. Once the proposed developments are constructed, harassment of wildlife could occur from various park users of these facilities. Also, essential fish habitat at the Seashore is located on the soundside in areas of submerged vegetation and activities associated with the proposed action may impact fish and essential fish habitat.

Whether for nesting, resting, foraging, or feeding, the Seashore provides for a diverse assemblage of birds. Rich, varied habitats and the Seashore’s location along the Atlantic Flyway attract birds. In 1999, the American Bird Conservancy designated Cape Hatteras National Seashore as a Globally Important Bird Area in recognition of the Seashore’s value in bird migration, breeding, and wintering (American Bird Conservancy 2005). Habitat loss and harassment from noise and disturbance could occur from the proposed action.

## **Visitor Use and Experience**

The purpose of the proposed action is to allow optimal use of the National Seashore by visitors while ensuring adherence to the requirements of the ORV management plan in protecting beach- nesting birds and sea turtles and avoiding conflicts between ORV users and other users.

## **Human Health and Safety**

Large numbers of vehicles and pedestrians use many of the same Seashore beaches at the same time, increasing the potential for visitor use conflicts and safety issues. The ORVMP EIS addressed health and safety issues related to ORV use under the Visitor Use topic. This EA addresses the safety and health of construction crews as well as the safety of the visitors to the Seashore.

## **IMPACTS CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION**

### **Geohazards**

There are no known geohazards in the Seashore that would be affected by the implementation of an ORV management plan.

### **Unique Ecosystems, Biosphere Reserves, World Heritage Sites**

There are no known biosphere reserves, World Heritage sites, or unique ecosystems located at the Seashore; therefore, construction of the 29 proposed facilities would have no effect. The Seashore is classified as a Globally Important Bird Area and potential impacts to bird species are included for discussion in this document under wildlife and wildlife habitats.

### **Air Quality**

The Cape Hatteras National Seashore is located in an area classified by the U.S. Environmental Protection Agency (EPA) as being in attainment for all six criteria air pollutants. Air quality at the park is protected under several provisions of the CAA, including the National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration (PSD) Program. Impacts to air quality due to implementing the ORVMP, including the development of parking areas, unpaved roads and beach access ramps, pedestrian foot paths, and ADA accessible boardwalks, were discussed in the FEIS. NPS completed an air modeling analysis as part of the NEPA process during the development of the ORVMP/EIS. Constructing the additional facilities proposed in this EA would have negligible, short-term, adverse effects to air quality. Any short-term, adverse effects to air quality during construction would be within state and Federal air quality standards. For the reasons mentioned above, impacts to air quality were dismissed from further analysis in this document.

### **Prime Farmlands**

There are no designated prime farmland soils in the Seashore; therefore, this topic was dismissed from further analysis in this EA.

### **Federally Listed Threatened and Endangered Species**

Impacts to endangered and threatened species must be examined as required by the ESA. A review of the United States Fish and Wildlife Service (USFWS) technical assistance website was conducted in December of 2012. Eleven species are listed as threatened or endangered under the ESA within Dare and Hyde counties. Table 1-2. Lists threatened and endangered species listed under the ESA for Dare and Hyde counties, North Carolina.

**Table 1-2 Endangered and Threatened Species Listed under the ESA for Dare and Hyde counties, North Carolina.**

Species	Status	County
<b>Birds</b>		
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	Endangered	Dare and Hyde
Piping Plover ( <i>Charadrius melodus</i> )	Threatened	Dare and Hyde
Roseate tern ( <i>Sterna dougallii dougallii</i> )	Endangered	Dare
<b>Reptiles</b>		
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	Endangered	Dare and Hyde
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	Endangered	Dare and Hyde
Kemp's Ridley sea turtle ( <i>Lepidochelys kempii</i> )	Endangered	Dare and Hyde
Green Sea turtle ( <i>Chelonia mydas</i> )	Threatened	Dare and Hyde
<b>Mammals</b>		
West Indian Manatee ( <i>Trichechus manatus</i> )	Endangered	Dare and Hyde
Red Wolf ( <i>Canis rufus</i> )	Experimental Population, Non-Essential	Dare and Hyde
<b>Flowering Plants</b>		
Seabeach amaranth ( <i>Amaranthus pumilus</i> )	Threatened	Dare
Sensitive joint-vetch ( <i>Aeschynomene virginica</i> )	Threatened	Hyde

(USFWS 2012a; USFWS 2012b)

No threatened or endangered species are anticipated to occur in the development locations. No federally listed plant species were found within the vicinity of the 29 proposed construction projects during three vegetation surveys conducted in the summer of 2012.

Suitable habitat for the Red-cockaded woodpecker and West Indian manatee does not occur within the locations of the proposed facilities. Therefore, these species are not discussed or analyzed further in this document. Impacts to the piping plover, hawksbill sea turtle, leatherback sea turtle, Kemp's Ridley sea turtle, and the green sea turtle due to implementing the ORVMP, including development of parking areas, unpaved ORV ramps and roads, and ADA accessible boardwalks were analyzed in the FEIS. Therefore, these species are not discussed or analyzed further in this document.

### Streamflow Characteristics

Actions related to the proposed action would not have an effect on streamflow characteristics. The developments would not occur in any area that would impact streamflow.

## **Cultural Landscapes**

Cultural landscapes are settings that humans have created in the natural world, revealing essential ties between the land and the people. These special places illustrate human manipulation and adaptation of the land. The Seashore has five cultural landscapes, Island Light Station, Little Kinnakeet Life Saving Station, Cape Hatteras Light Station, Hatteras Weather Bureau Station, and Ocracoke Light Station. None are in an area of the proposed action. Thus, impacts to cultural landscapes are not anticipated, and this topic is dismissed from further analysis (NPS 2010).

In addition the Seashore is part of a Scenic Byway with a guiding “Corridor Management Plan for the Outer Banks Scenic Byway” (OBSBAC 2008). One of the goals of the plan is to ensure the opportunity of visitors and residents to appreciate the resources, and scenery of the Byway with comfort, ease of movement, and safety. The scenic quality of the Byway relies heavily on the views of lighthouses and other historic structures. The proposed action would not block the view of any lighthouses or historic structures. It would also provide enhanced visitor facilities to allow for a more comfortable, and safe opportunity to experience the byway. The proposed facilities are similar to existing parking areas, ramps, and boardwalks and would not impart any new impacts to the viewsheds in the Seashore.

To ensure compliance with Section 106 of the National Historic Preservation Act of 1966, this document will be reviewed by the State Historic Preservation Office when it is submitted to the North Carolina State Environmental Review Clearinghouse.

## **Historic Structures and Districts**

According to Director’s Order 28, structures are defined as material assemblies that extend the limits of human capability. In plain language, this means a constructed work, usually immovable by nature or design, consciously created to serve some human activity. Examples are buildings, monuments, dams, roads, railroad tracks, canals, millraces, bridges, tunnels, locomotives, nautical vessels, stockades, forts and associated earthworks, Indian mounds, ruins, fences, and outdoor sculptures. The Seashore contains 36 historic structures, 20 of which are in good condition (NPS 2007a). Structures at the Seashore range from cemeteries to entire complexes. For example, three historic U.S. Life Saving Service stations still stand at Chicamacomico, Little Kinnakeet, and Bodie Island. The Hatteras Weather Bureau Station and Ocracoke Light Station are listed in the National Register. The Bodie Island Light Station, Bodie Island Lifesaving/Coast Guard Station, and Cape Hatteras Light Station are listed in the National Register as historic districts (NPS 2010). In addition, the Cape Hatteras Light Station is also designated as a National Historic Landmark. In general these structures are located off the beach in the dunes or on the soundside and are not in any of the

development locations of the proposed action. Therefore the topic of historical structures and districts are not analyzed further in this EA.

To ensure compliance with Section 106 of the National Historic Preservation Act of 1966, this document will be reviewed by the State Historic Preservation Office when it is submitted to the North Carolina State Environmental Review Clearinghouse.

### **Ethnographic Resources**

There are no ethnographic resources as defined by Executive Order 13007, in or near the proposed action corridor. For this reason, ethnographic resources were dismissed from detailed evaluation.

### **Museum Collections**

Museum objects are manifestations and records of behavior and ideas that span the breadth of human experience and depth of natural history. The Seashore has collections of artifacts on display at the Cape Hatteras Lighthouse and at each visitor center. The official Seashore archives and artifact collections are housed at Fort Raleigh National Historic Site at Manteo. These various collections are not located on the ocean or soundside beaches and would not be impacted by implementing the proposed action. Therefore this topic was not carried forward for further analysis.

### **Indian Trust Resources**

The Federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights. No Indian trust resources have been identified for Cape Hatteras National Seashore. Therefore, this impact topic is eliminated from further consideration.

### **Sacred Sites**

Of the federally acknowledged tribes recognized pursuant to Public Law 103-454, 108 Statute 4791, the Tuscarora Nation is the only tribe affiliated with the Seashore. NPS is not aware of any historic properties that may be of religious and cultural significance to the Tuscarora Nation that would potentially be affected by the proposed action to facilitate visitor access. During the development of the ORV management plan/EIS, the Seashore consulted with the Tuscarora Nation and the Tuscarora Nation did not inform the Seashore of sacred sites or other historic properties of religious or cultural significance to them which would be potentially affected. Therefore, the topic of sacred sites has been dismissed from further consideration.

### **Paleontological Resources**

No paleontological resources are located within the Seashore that would be impacted by construction of the 29 proposed developments. Therefore paleontological resources were dismissed from further discussion and analysis.

## **Energy Resources**

This topic involves assessing energy requirements and the potential for energy conservation associated with the various alternatives, but is most relevant to facility construction projects. The majority of ORV use at the Seashore involves gaining access to fishing areas, where vehicles are then turned off once the desired fishing spot is reached. Because vehicular access to the beach would be maintained under this plan/EIS at current or reduced levels, there would be negligible impacts on energy resources, as public fuel consumption would not change to a large degree as a result of the implementation of this plan. However, due to differences in management intensity among the alternatives, there would be differences in energy (fuel) consumption from implementation of the ORV management plan. The Seashore would continue to operate under the wise energy use guidelines and requirements stated in the NPS 2006 Management Policies, Executive Order 13123 (Greening the Government Through Effective Energy Management), Executive Order 13031 (Federal Alternative Fueled Vehicle Leadership), Executive Order 13149 (Greening the Government Through Federal Fleet and Transportation Efficiency), and the 1993 NPS Guiding Principles of Sustainable Design.

## **Green House Gas Emissions and Climate Change**

There is strong evidence linking global climate change to human activities, especially greenhouse gas emissions associated with the burning of fossil fuels (IPCC 2007). Some of the activities associated with ORV management and use would result in fossil fuel consumption, for example, vehicular trips by Seashore personnel and equipment used to construct and maintain ramps, interdunal roads, and parking areas.

However, greenhouse gas emissions associated with the proposed action would be negligible in comparison to local, regional, and national greenhouse gas emissions. Therefore, the issue of the contribution of the proposed construction projects activities to climate change through greenhouse gas emissions was dismissed from further analysis.

## **Socioeconomics and Environmental Justice**

The 2010 FEIS includes a detailed analysis of potential economic impacts from implementing the ORVMP, including construction of parking areas, ORV ramps, and ADA accessible boardwalks. The socioeconomic Region of Influence (ROI) defined for this EA is the same as the socioeconomic ROI defined in the FEIS. The types of developments proposed in this EA are similar to those proposed under Alternative F (NPS Preferred Alternative) of the FEIS. All else equal, the additional developments proposed in this EA would have impacts similar to those discussed in the FEIS. Appendix B of this EA updates the demographic and economic data in the FEIS with 2010 or the best available data using the same sources (U.S. Census Bureau, Bureau of Labor Statistics, Outer Banks Visitor Bureau, etc.).

Overall, the 2010 demographic and economic trends are similar to the 2000 figures used as a baseline in the FEIS. Only projected population growth differs greatly from trends discussed in the FEIS. In 2000, Dare and Hyde County populations were projected to decline, according to North Carolina's Office of State Budget and Management. North Carolina was projected to increase 57 percent by 2029. As of 2013, population projections for Dare and Hyde counties for the next twenty years indicate the reverse trend; in fact, Dare County is projected to increase at a rate higher than North Carolina's 45.5 percent. Hyde County is also projected to increase at a positive rate of 5.6 percent (Office of State Budget and Management 2013).

Slight variations in demographics, income statistics; employment characteristics; employment by sector; nonemployers by industry; tax receipts from lodging and meals; travel expenditures, and housing are to be expected in any local economy over any ten-year period; especially one dependent on tourism and in light of the global financial downturn beginning in 2007-2008. As such, the need for further evaluation of socioeconomics is dismissed as the same types of socioeconomic impacts found in the FEIS would apply in this EA.

Impacts on environmental justice due to implementing the proposed action were dismissed in the ORVMP FEIS due to the lack of minority or low-income populations. Appendix B provides 2010 statistics for minority populations, income statistics, and poverty levels; and here again in this EA potential impacts are dismissed for the same reason(s). Additionally, the proposed facilities are not anticipated to result in any identifiable human health effects, and therefore are not anticipated to disproportionately affect minority and low-income populations. As such, environmental justice is dismissed from further analysis.

### **Urban Quality, Gateway Communities**

A gateway community is defined by the NPS Management Policies 2006 as a community that exists in close proximity to a unit of the national park system whose residents and elected officials are often affected by the decisions made in the course of managing the park. Because of this, there are shared interests and concerns regarding decisions. Gateway communities usually offer food, lodging, and other services to park visitors. They also provide opportunities for employee housing and a convenient location to purchase goods and services essential to park administration. The communities within and adjacent to the Seashore would fall under this definition. Impacts to urban quality and gateway communities from constructing the proposed facilities would be negligible and would not be expected to substantially alter the physical and social structures of nearby communities.

### **Soundscapes**

Impacts related to soundscapes could occur within the vicinity of each of the proposed 29 developments. Parking area and ORV ramp construction would utilize heavy machinery in the short-term and involve ORV use in the longer term. Construction, vehicle noise, and pedestrian noise has the potential to impact other recreational uses behind the dunes or on the soundside of the Seashore, such as bird watching or enjoying the solitude and natural soundscape of the Seashore. NPS (2010) analyzed impacts to the soundscape from implementing the Off-Road Vehicle Management Plan, and only a few projects have been modified from that plan. Noise from the construction and maintenance equipment as well as the ORVs could impact other recreational users, such as bird watchers and those enjoying solitude. The construction and any maintenance noise from heavy machinery would be temporary and localized. The analysis in NPS (2010) concluded minor adverse impacts due to the 15 mile per hour speed limit. This means the vehicular noise should not dominate the soundscape beyond approximately 98 feet (30 meters) inland or 33 feet (10 meters) towards the surf or the sound increases 3 A-weighted decibels to a distances of 33 feet (10 meters) in either direction. Impacts to wildlife from noise are analyzed in the wildlife and wildlife habitat section. The analysis in the ORVMP EIS is incorporated by reference. Due to the minor impacts and history of ongoing ORV activity, this topic is dismissed from detailed analysis.

### **Seashore Management and Operations**

The findings of the ORVMP EIS were that, overall, there would be an increase in duties related to ORV management for staff in the facility management and park management/administration divisions that could result in some reprioritization of work, but would not be expected to impact overall duties resulting in long-term minor adverse impacts. In the visitor protection and resources management divisions, staff could accomplish their duties with existing budgets, but it would require them to re-prioritize and reallocate staff, and would not leave staff with adequate time to address other needs at the park outside of ORV management. Since the ORVMP went into effect the ORV permit fees have provided sufficient funding to the Seashore to increase staff. Staff levels at this time are such that the additional developments proposed would have no impact on Seashore Management and Operations. Therefore, Seashore Management and Operations is not considered for detailed evaluation in this EA.

## **FEDERAL, STATE, AND LOCAL LAWS, POLICES, REGULATIONS AND PLANS DIRECTLY RELATED TO THE PROPOSED ACTION**

### ***Executive Order 11644: Use of Off-Road Vehicles on the Public Lands***

On February 8, 1972, President Richard Nixon issued Executive Order 11644 to “establish policies and provide for procedures that will ensure the use of ORVs on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.”

The executive order directs agencies to develop and issue regulations and administrative instructions to designate the specific areas and trails on public lands on which ORV use may be permitted, and areas in which ORV use may not be permitted. The location of areas and trails shall:

- Minimize damage to soil, watershed, vegetation, or other resources of the public lands;
- Minimize harassment of wildlife or significant disruption of wildlife habitats;
- Minimize conflicts between ORV use and other existing or proposed recreational uses of the same on neighboring public lands, and ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors; and
- Not be located in officially designated wilderness areas or primitive areas and shall be located in areas of the national park system, natural areas, or national wildlife refuges and game ranges only if the respective agency head determines that ORV use in such locations will not adversely affect their natural, aesthetic, or scenic values.

### ***Code of Federal Regulations, Title 36***

Title 36, chapter 1, provides the regulations “for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service.” These regulations are utilized to fulfill the statutory purposes of the units of the national park system: to conserve scenery, natural and historical objects, and wildlife, and to provide for the enjoyment of those resources in a manner that will leave them unimpaired for the enjoyment of future generations. Part 2 of these regulations establishes resource protection, public use, and recreation regulations applicable to public use of units of the national park system. Part 4 of these regulations establishes vehicle and traffic safety regulations applicable to areas within a park that are open to public traffic.

### ***Coastal Zone Management Act, 1966***

The Coastal Zone Management Act (CZMA) (16 USC 1451 et seq.) seeks to preserve and protect coastal resources. Through the CZMA, states are encouraged to develop coastal zone management programs (CZMPs) to allow economic growth that is compatible with the protection of natural resources, the reduction of coastal hazards, the improvement of water quality, and sensible coastal development. The CZMA provides financial and technical incentives for coastal states to manage their coastal zones in a manner consistent with CZMA standards and goals. CZMA Section 307 states, “Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs.” The Coastal Area Management Act (CAMA) (G.S. 113A) established the state’s cooperative program of coastal area management, including unified policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance. This Act established the Coastal Resources Advisory Council and North Carolina Coastal Resources Commission, under the state’s Department of Environment and Natural Resources (NCDENR). The NCDENR Division of Coastal Management uses the rules and policies of the North Carolina Coastal Resources Commission to protect, conserve, and manage North Carolina’s coastal resources through an integrated program of planning, permitting, education, and research. These activities are carried out through the state’s responsibilities under the CAMA, the North Carolina Dredge and Fill Law (G.S. 113-229), and the Federal CZMA in the 20 coastal counties. The CAMA program was federally approved in 1978 and is the state’s CZMP under the CZMA. Localities are responsible for planning while the state establishes areas of environmental concern. A project must obtain a CAMA permit if it:

- Is in one of the 20 counties covered by the Act (including Dare and Hyde counties),
- Is considered “development” under the Act,
- Is in or affects an area of environmental concern (AEC), and
- Does not qualify for an exemption.

As a part of this program, the Coastal Resources Commission designated “areas of environmental concern” in the 20 coastal counties and set rules for managing development in these areas. An AEC is an area of natural importance that may be easily destroyed by erosion or flooding or that may have environmental, social, economic, or aesthetic values that make it valuable to North Carolina. At least 90 days prior to taking action, NPS would provide a consistency determination stating how the proposed action is, to the maximum extent practicable, consistent with the enforceable policies of the CAMA.

### ***Endangered Species Act of 1973, as Amended***

The 1973 ESA provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Section 7 of this Act requires all Federal agencies to consult with the Secretary of the Interior on all projects and proposals with the potential to impact federally endangered or threatened plants and animals. It also requires Federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. Federal agencies are also responsible for ensuring that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat. Section 9 of the Act makes it unlawful for a person to “take” a listed animal without a permit. The term “take” is defined in the Act as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” Through regulations, the term “harm” is defined as “an act which actually kills or injures wildlife. Such an Act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.” Listed plants are not protected from take, although it is illegal to collect or maliciously harm them on Federal land. The Act also imposes civil and criminal penalties for violations of any provisions of the Act.

### ***Antideficiency Act***

The *Antideficiency Act* is a series of statutes (originating from 16 Stat. 251 in 1870) that prohibit Federal managers from making or authorizing expenditures in excess of the amount available to them from appropriations or other funds, unless authorized by law. Based on this, the proposed action must be able to be implemented through expected funding sources.

### ***Marine Mammal Protection Act, 1972***

The *Marine Mammal Protection Act* (MMPA) prohibits, with certain exceptions, the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. The MMPA defines “take” as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.” It defines harassment as “any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.” The MMPA recognizes that some marine mammal species or stocks may be in danger of extinction or depletion as a result of human activities, and that these species or stocks must not be permitted to be depleted. The MMPA, as amended in 1994, provides for certain exceptions to the take prohibitions, such as Alaska Native subsistence and permits and authorizations for scientific research; a program to authorize and control the taking of marine mammals incidental to commercial fishing operations; preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; and studies of pinniped-fishery interactions.

### ***Migratory Bird Treaty Act of 1918 and Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds***

Migratory birds are of great ecological and economic value to this country and to other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of people who study, watch, feed, or hunt these birds throughout the United States and other countries. The United States has recognized the critical importance of this shared resource by ratifying international, bilateral conventions for the conservation of migratory birds. These migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats, and through the MBTA, the United States has implemented these migratory bird conventions with respect to the United States.

Executive Order 13186 directs executive departments and agencies to take certain actions to further implement the MBTA. The MBTA implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds.

Under this Act, it is prohibited, unless permitted by regulations, to “pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention...for the protection of migratory birds...or any part, nest, or egg of any such bird” (16 USC 703). Subject to limitations in the Act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

### ***National Environmental Policy Act, 1969, as Amended***

NEPA is implemented through regulations of the CEQ (40 CFR 1500–1508). The NPS has in turn adopted procedures to comply with NEPA and the CEQ regulations, as found in Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making, and its accompanying handbook. Section 102 (2)(C) of NEPA requires that an EIS be prepared for proposed major Federal actions that may significantly affect the quality of the human environment.

### ***National Historic Preservation Act of 1966, as Amended***

Section 106 of this Act requires Federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. All actions affecting the Seashore’s historic, archaeological, and cultural resources must comply with this legislation. For this EA, compliance with Section 106 is being combined with NEPA compliance. Notification was provided to the

State Historic Preservation Office and to the Advisory Council that compliance was being combined with NEPA.

### ***National Parks Omnibus Management Act of 1998***

Both the *National Parks Omnibus Management Act of 1998* (NPOMA) (16 USC 5901 et seq.) and NEPA are fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis in this case.

### ***NPS Organic Act, as Amended***

By enacting the *Organic Act of 1916*, Congress directed the U.S. Department of the Interior and NPS to manage units of the national park system “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (16 USC 1). The 1978 *Redwood Amendment* reiterates this mandate by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1 a-1). Congress intended the language of the *Redwood Amendment* to reiterate the provisions of the *Organic Act*, not to create a substantively different management standard. The House Committee report described the *Redwood Amendment* as a “declaration by Congress” that the promotion and regulation of the national park system is to be consistent with the *Organic Act*. The Senate Committee report stated that under the *Redwood Amendment*, “The Secretary has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 Act to take whatever actions and seek whatever relief as will safeguard the units of the national park system.” Although the *Organic Act* and the *Redwood Amendment* use different wording (“unimpaired” and “derogation”) to describe what the NPS must avoid, both acts define a single standard for the management of the national park system—not two different standards. For simplicity, *NPS Management Policies 2006* uses “impairment,” not both statutory phrases, to refer to that single standard.

Despite these mandates, the *Organic Act* and its amendments afford the NPS latitude when making resource decisions to allow appropriate visitor use while preserving resources. By these acts Congress “empowered [the NPS] with the authority to determine what uses of park resources are proper and what proportion of the park’s resources are available for each use” (*Bicycle Trails Council of Marin v. Babbitt*, 82 F.3d 1445, 1453 [9th Cir. 1996]).

Courts consistently interpret the *Organic Act* and its amendments to elevate resource conservation above visitor recreation. *Michigan United Conservation Clubs v. Lujan*, 949 F.2d 202, 206 (6th Cir. 1991) states: “Congress placed specific emphasis on conservation.” The court in *National Rifle Association of America v. Potter*, says “in the

*Organic Act* Congress speaks of but a single purpose, namely, conservation.” The NPS *Management Policies 2006* also recognize that resource conservation takes precedence over visitor recreation. The policy dictates: “when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant” (NPS 2006, sec. 1.4.3, 10). This policy has been further reiterated in a recent court ruling on the Yellowstone Winter Use Plan/EIS (*National Parks Conservation Association v. National Park Service* – No. 07-2112) that states,

The *Organic Act* charges the NPS with the duty to provide for the enjoyment: of the parks’ resources and values in “such manner and by such means as will leave them unimpaired for the enjoyment of future generations” 16 U.S.C. Section 1. This is not blanket permission to have fun in the parks in any way the NPS sees fit. As Plaintiffs articulated at the hearing, the “enjoyment” referenced in the *Organic Act* is not enjoyment for its own sake, or even enjoyment of the parks generally, but rather the enjoyment of “the scenery and natural and historic objects and the wild life” in the parks in a manner that will allow future generations to enjoy them as well.

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the NPS has discretion to allow negative impacts when necessary (NPS 2006a, sec. 1.4.3, 10). While some actions and activities cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (NPS 2006a, sec. 1.4.3, 10). Specifically, NPS *Management Policies 2006*, section 1.4.3.1 states: “In the administration of authorized uses, park managers have the discretionary authority to allow and manage the use, provided that the use will not cause impairment or unacceptable impacts.” The *Organic Act* prohibits actions that permanently impair park resources unless a law directly and specifically allows for the action (16 USC 1a-1). An action constitutes “an impairment” when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006, sec. 1.4.5, 11). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006a, sec. 1.4.5, 11).

Park managers must also not allow uses that would cause unacceptable impacts (NPS 2006a, sec. 1.4.7, 12). These are impacts that fall short of impairment, but are still not acceptable within a particular park’s environment. For the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- Be inconsistent with a park’s purposes or values, or
- Impede the attainment of a park’s desired future conditions for natural and cultural resources as identified through the park’s planning process, or
- Create an unsafe or unhealthful environment for visitors or employees, or

- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- unreasonably interfere with
  - Park programs or activities, or
  - An appropriate use, or
  - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park, or
  - NPS concessioner or contractor operations or services.

Because park units vary based on their enabling legislation, natural resources, cultural resources, and missions, management activities appropriate for each unit, and for areas in each unit, vary as well. An action appropriate in one unit could impair or cause unacceptable impacts to resources in another unit. In 2010 NPS has issued Interim Guidance for Impairment Determinations in NPS NEPA documents. An impairment determination will be made in an attachment to the decision document of the proposed action.

***Executive Order 11990: Protection of Wetlands***

This executive order directs federal agencies to avoid, to the extent possible, the long-term and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

***Executive Order 11988: Floodplain Management***

This executive order directs Federal agencies to avoid, to the extent possible, the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

***NPS Management Policies 2006***

NPS *Management Policies 2006* address management of ORVs in section 8.2.3.1, Off-Road Vehicle Use. This section states (NPS 2006a): Off-road motor vehicle use in national park units is governed by Executive Order 11644 (*Use of Off-Road Vehicles on the Public Lands*, as amended by Executive Order 11989), which defines off-road vehicles as “any motorized vehicle designed for or capable of cross-country travel on or immediately over, land, water, sand, snow, ice, marsh, swampland, or other natural terrain” (except any registered motorboat or any vehicle used for emergency purposes). Unless otherwise provided by statute, any time there is a proposal to allow a motor vehicle meeting this description to be used in a park, the provisions of the executive order must be applied.

In accordance with 36 CFR 4.10(b), routes and areas may be designated only in national recreation areas, national seashores, national lakeshores, and national

preserves, and only by special regulation. In accordance with the executive order, they may be allowed only in locations where there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values, and in consideration of other existing or proposed recreational uses. The criteria for new uses, appropriate uses, and unacceptable impacts listed in sections 8.1 and 8.2 must also be applied to determine whether off-road vehicle use may be allowed. As required by the executive order and the *Organic Act*, superintendents must immediately close a designated off-road vehicle route whenever the use is causing, or will cause, unacceptable impacts on the soil, vegetation, wildlife, wildlife habitat, or cultural and historic resources.

NPS administrative off-road motor vehicle use will be limited to what is necessary to manage the public use of designated off-road vehicle routes and areas; to conduct emergency operations; and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. Management policies relating to resource protection also were considered in developing this EA. For example, NPS *Management Policies 2006* instructs park units to maintain, as parts of the natural ecosystems of parks, all plants and animals native to park ecosystems, in part by minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them (NPS 2006a, sec. 4.4.1).

NPS *Management Policies 2006* directs park units to determine all management actions for the protection and perpetuation of federally, state, or locally listed species through the park management planning process, and to include consultation with lead Federal and state agencies as appropriate. Section 4.4.2.3, Management of Threatened or Endangered Plants and Animals, specifically states:

The NPS will survey for, protect, and strive to recover all species native to national park system units that are listed under the *Endangered Species Act*. The NPS will fully meet its obligations under the *Organic Act* and the *Endangered Species Act* to both proactively conserve listed species and prevent detrimental effects on these species. To meet these obligations, the NPS will:

- Cooperate with both the USFWS and the National Marine Fisheries Service (NMFS) to ensure that NPS actions comply with both the written requirements and the spirit of the Endangered Species Act. This cooperation should include the full range of activities associated with the Endangered Species Act, including consultation, conferencing, informal discussions, and securing of all necessary scientific and/or recovery permits.
- Undertake active management programs to inventory, monitor, restore, and maintain listed species' habitats; control detrimental non-native species; control detrimental visitor access; and re-establish extirpated populations as necessary to maintain the species and the habitats upon which they depend.
- Manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for the recovery of threatened and endangered species.

- Cooperate with other agencies to ensure that the delineation of critical habitat, essential habitat, and/or recovery areas on park-managed lands provides needed conservation benefits to the total recovery efforts being conducted by all the participating agencies.
- Participate in the recovery planning process, including the provision of members on recovery teams and recovery implementation teams where appropriate.
- Cooperate with other agencies, states, and private entities to promote candidate conservation agreements aimed at precluding the need to list species.
- Conduct actions and allocate funding to address endangered, threatened, proposed, and candidate species. Section 4.4.2.3 of the NPS Management Policies 2006 also states, “NPS will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species, to the greatest extent possible. In addition, the Service will inventory other native species that are of special management concern to parks (such as rare, declining, sensitive, or unique species and their habitats) and will manage them to maintain their natural distribution and abundance” (NPS 2006a, sec. 4.4.2.3).

### ***Cape Hatteras National Seashore Enabling Legislation, 1937***

This legislation was an act of Congress that provided for the authorization of the Cape Hatteras National Seashore. Section 3 of the Seashore’s enabling legislation (the Act) states, “the administration, protection, and development of the aforesaid national seashore shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of the Act of August 25, 1916 (39 Stat. 535),” which is more commonly known as the *Organic Act*. Section 3 continues by stating, “that the legal residents of villages...shall have a right to earn a livelihood by fishing within the boundaries to be designated by the Secretary of the Interior, subject to such rules and regulations as the said Secretary may deem necessary in order to protect the area for recreational use as provided for in this Act.” Section 4 of this legislation states, “Except for certain portions of the area, deemed to be especially adaptable for recreational uses, particularly swimming, boating, sailing, fishing, and other recreational activities of similar nature, which shall be developed for such uses as needed, the said areas 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.”

### ***Code of Federal Regulations Title 36, Section 2.2, Wildlife Protection***

Section 2.2 addresses the protection of wildlife at the Seashore and prohibits the following: the taking of wildlife, except by authorized hunting and trapping activities conducted in accordance with paragraph (b) of Section 2.2; the feeding, touching, teasing, frightening or intentional disturbing of wildlife nesting, breeding or other activities; and possessing unlawfully taken wildlife or portions thereof.

## ***NPS Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making and Handbook***

Director's Order 12 and its accompanying handbook lay the groundwork for how the NPS complies with NEPA. Director's Order 12 and handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects. Director's Order 12 requires that impacts to park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision makers to understand the implications of those impacts in the short and long-term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists.

## ***NPS Director's Order 28: Cultural Resource Management***

Director's Order 28 sets forth the guidelines for management of cultural resources, including cultural landscapes, archeological resources, historic and prehistoric structures, museum objects, and ethnographic resources. This order calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principles contained in the *NPS Management Policies 2006*.

## ***NPS Director's Order 77: Natural Resource Protection***

Director's Order 77 addresses natural resource protection, with specific guidance provided in Reference Manual 77: Natural Resource Management. Natural Resource Management Reference Manual 77 offers comprehensive guidance to NPS employees responsible for managing, conserving, and protecting the natural resources found in National Park System units. The Reference Manual serves as the primary guidance on natural resource management in units of the National Park System. Reference Manual chapters that are particularly relevant to proposed action include endangered, threatened, and rare species management; geologic resources management; native animal management; shoreline management; vegetation management; special use permitting; wetland protection (Director's Order 77-1); and floodplain management (Director's Order 77-2).

## ***General Management Plan***

The 1984 General Management Plan / Development Concept Plan / Environmental Assessment for Cape Hatteras National Seashore was developed to guide the preservation, use, development, and operation of the Seashore for a 5- to 10-year period.

## ***Resource Management Plan***

The 1997 resource management plan states that the use of ORVs at the Seashore is a matter of growing controversy, and impacts from these vehicles on natural resources and pedestrian visitors are informally monitored on a continual basis. The plan noted,

but did not cite, a study examining the effects of human related disturbances, including vehicles, on migrating shorebirds and waterbirds, and stated that more detailed studies would be required to establish effective ORV management.

### ***Visitor Services Reports***

The Outer Banks Group of the National Park Service prepares visitor services reports to gain an understanding of the current level of visitor satisfaction with the Seashore. A visitor appraisal was done in 2012, and visitor research project in 2006. The 2008 Visitor Survey Card Data Report found that 95% of visitors were satisfied overall with the facilities, services, and recreation opportunities (UIPSU 2008).

### ***Long-Range Interpretation Plan***

A long-range interpretation plan for the Seashore was completed in September 2007. The Long-Range Interpretation Plan recommends actions to be taken over the next five to seven years to improve the Seashore's personal services program and interpretive media, and provides an achievable implementation strategy (NPS 2007b).

### ***North Carolina Wildlife Resources Commission Nongame and Endangered Wildlife Program***

The Nongame and Endangered Wildlife Program, established in North Carolina in 1983, aims to prevent species from becoming endangered through maintaining viable, self-sustaining populations of all native wildlife, with an emphasis on species in decline. The NCWRC has a Comprehensive Wildlife Strategy to protect state-listed species. This strategy includes securing funding for state fish and wildlife agencies to take preventative actions that help keep rare species from becoming endangered, and keep common species common (NCWRC 2005). Endangered and threatened wildlife and wildlife species of special concern are protected under Article 25 of chapter 113 of the *North Carolina General Statutes*.

### ***North Carolina Natural Heritage Program***

Among other responsibilities, the North Carolina Natural Heritage Program (NCNHP) identifies the most important places for the conservation of rare species and high quality natural communities in the state. As of January 2008, the NCNHP had identified more than 2,400 of these places, officially referred to as Significant Natural Heritage Areas (SNHAs). If a natural area cannot be purchased by NCNHP, its ecological significance can be recognized through a registry agreement, which is a voluntary agreement with the landowner that provides limited protection but recognizes the owner's commitment to conservation of the area. There are 10 SNHAs located within the boundaries of the Seashore. The NPS signed two agreements with NCNHP for the formal protection of nine of these areas. The Buxton Woods SNHA was registered in 1979 and eight other SNHAs were registered in the 1987 agreement. The purpose of the agreements was to "express the sincere intentions of the National Park Service to refrain from making or permitting changes that negatively affect the natural values for which this area was

registered within the boundaries outlined.” It specifically stated, “Vehicular traffic on beach locations will be regulated to prevent damage to nesting colonies of water birds.”

The registered SNHAs potentially relevant to the proposed action are Turtle Pond and Cape Hatteras Lighthouse Pond, Cape Hatteras Point, Hatteras Sand Flats, Ocracoke Island - Eastern End, and Ocracoke Island - Western End Sand Flats. The unregistered Hatteras Island - Middle Section SNHAs is also in the Seashore. The significance of these SNHAs is primarily the habitat that they provide for shorebirds such as piping plover, American oystercatchers, and several species of colonial waterbirds, although several sensitive plant communities are also identified as part of these ecological communities. The NPS will consult with NCNHP to ensure that the construction avoids impacts to any sensitive species.

### ***North Carolina Department of Transportation***

The North Carolina Department of Transportation (NCDOT) has various projects related to NC-12 and other Outer Banks access issues. The NCDOT is considering some long-term projects in response to the changing physical landscape of the area such as a bridge from Avon to Buxton, which is a possible area for a future inlet. The Outer Banks Task Force has developed a long-term management plan for NC-12 that was considered during the development of the Cape Hatteras National Seashore OVRMP/EIS and this EA. NC-12 connects the communities located within Cape Hatteras National Seashore to the mainland of North Carolina. Island residents depend on the roadway for off-island community services, such as hospitals, emergency response, and waste collection. NC-12 is also the primary evacuation route for all permanent and temporary residents on the island when severe weather is approaching. Storms frequently cause the ocean to overwash NC-12 and deposit large quantities of sand over portions of the roadway. The storms sometimes damage NC-12, which interrupts access and services to the island and causes hardships for island residents. NC-12 must be continually repaired and maintained to prevent permanent loss of access on Hatteras Island. To address these issues a task force was formed comprising the NCDOT, NPS, U.S. Army Corps of Engineers (Corps), USFWS, NMFS, Federal Highway Administration (FHWA), Dare and Hyde counties, and the NCDENR. The mission of this task force is to develop a long-range protection and maintenance plan for the transportation system on the Outer Banks. As part of this task force, hot spots for erosion have been identified and include Northern Pea Island, Sandbag area, Rodanthe “S” curves, Buxton / Canadian Hole, Hatteras Village, and Ocracoke (OBTF 2009). The NCDOT is proposing to build a new bridge to replace the existing Herbert C. Bonner Bridge, originally built in the 1960s, over Oregon Inlet before the end of the bridge’s reasonable service life. The NCDOT and the FHWA released a supplemental draft EIS regarding this replacement, and a supplement to the EIS was released in 2007 (OBTF 2007; FHWA 2007). In September 2008, NCDOT announced its preferred alternative, known as the Parallel Bridge with Phased Approach / Rodanthe Bridge Alternative. This alternative includes constructing a new Oregon Inlet bridge (Phase I) west of the existing structure, and later elevating NC-12 onto a series of bridges during Phases II-IV. Replacement of the Oregon Inlet bridge is expected to be complete in 2014 (NCDOT 2008).

## ***North Carolina Coastal Area Management Act***

Details regarding the CAMA were presented earlier in this document under the CZMA description.

## ***Dare and Hyde County Planning Documents***

The development and implementation of the proposed action considered the planning efforts of Dare and Hyde counties, primarily with respect to the cumulative impacts analysis and consistency determination. Since 1974, when the North Carolina General Assembly ratified the CAMA, each of the local governments in the twenty-county coastal region have been developing and updating land use plans. These land use plans have directed development in these areas and are responsible for the pattern of development we see today in Dare and Hyde counties. Both of these plans recognize the development that has occurred and the corresponding need for an increase in services as a result. These past patterns of land use development have influenced the amount of land available for habitat throughout the county, including portions of the counties located within the Seashore.

In Dare County, the County Planning Board serves as an advisory board to the Dare County Board of Commissioners. In compliance with the CAMA, Dare County prepared guidance and policies for land use development, known as the Land Use Plan (Dare County 2003), which provides local elected officials with a set of guidelines for development patterns and other land use issues that are important to the community. The Land Use Plan includes policies on various topics and implementation activities such as policies on water quality, residential and commercial development patterns, beach access, oceanfront and estuarine development, stormwater management, wastewater, and transportation. The latest version of the Dare County Land Use Plan was certified by the North Carolina Coastal Resources Commission in July 2003, and must be updated every five years. The 2008 plan update was submitted to the state for review in mid-January 2009 and as of February 1, 2010, was still under review (Owens pers. comm. 2010). The Land Use Plan applies to the unincorporated portions of Dare County, while each of the municipalities in Dare County adopts its own plans for its respective planning jurisdiction. The Dare County Land Use Plan works in conjunction with the zoning ordinance, as well as the CAMA. Except for the mainland villages and Wanchese, the remainder of unincorporated Dare County is zoned. Detailed zoning maps have been adopted for the villages of Duck, Collington, Roanoke Island, Avon, Buxton, and Hatteras. The villages of Rodanthe, Waves, Salvo, and Frisco are zoned S-1, which is a minimal zoning district that allows all uses but does establish some building setbacks and height limitations. In addition, the county adopted a Special Environmental District (SED-1) for the Buxton Woods maritime forest. This zoning district establishes special standards for land clearing and vegetation removal that are intended to protect the vegetative canopy of the Buxton Woods forest (Dare County 2003).

The Hyde County Land Use Plan, written in 1986, was updated in 1992, 1997, and 2006. Hyde County Land Use Plan, in compliance with the CAMA, analyzes land

development in the area to plan for future uses. The plan sets forth the following vision for the Island of Ocracoke (Hyde County 2006).

The vision of Ocracoke Island in the 21st century is a community that ensures livability and economic viability by offering the discerning vacationer a preferable alternative to the over commercialized beach destinations while providing improved attention to Ocracoke residents. The mission of county government should be to facilitate and support:

- Efforts to maintain the historic village assets.
- Efforts to preserve traditional native occupations and crafts including hunting and commercial fishing.
- Efforts to enhance the Island shopping opportunities with small locally owned shops and businesses.
- Efforts to provide affordable housing.
- Cooperative efforts with the community, NPS, and DOT to maintain access to the Island and provide necessary amenities. Ocracoke and Mainland should emphasize access.
- Support village craftsmen.

### ***Outer Banks Scenic Byway***

In the early 1990s, the NCDOT declared the Outer Banks corridor a state scenic byway. In September 2003, NCDOT completed an Outer Banks Scenic Byway Corridor Management Plan in preparation for seeking National Scenic Byway status. The Corridor Management Plan, updated in 2008, explored the “six intrinsic qualities” of the byway – scenic, natural, cultural, historic, archaeological, and recreational.

The corridor management plan recognized the Seashore as one of the important natural components of the byway. The 2008 plan included recommendations for stewardship of the natural and cultural resources at the Seashore. Based on these planning efforts, the Outer Banks road corridor was officially designated as a National Scenic Byway on October 16, 2009.

## **CHAPTER 2: ALTERNATIVES**

The alternatives evaluated in this environmental assessment include one action alternative and a no action alternative that would not implement the proposed action of constructing the 29 proposed developments to facilitate visitor access on the Seashore. The action alternative was designed to meet park objectives of:

- Facilitate visitor access along the Seashore;
- Provide a variety of visitor use experiences;
- Provide a satisfying visitor experience throughout the Seashore for all visitors that is consistent with the purpose for which the park was established;
- Ensure that future and current roads, ORV ramps, foot trails, boardwalks, and parking areas promote the safety of all visitors;
- Minimize conflicts between different types of recreation uses;
- Protect the Seashore's natural, cultural, scenic, and aesthetic values; and
- Work cooperatively with local communities and other government agencies to address mutual concerns.

This chapter also identifies alternatives or elements eliminated from further consideration. The environmentally preferred alternative is described and summaries of the important features of the alternatives and the effects of the alternatives are provided.

### **ALTERNATIVE A: NO ACTION ALTERNATIVE**

This alternative represents a continuation of the existing situation and provides a baseline for evaluating the changes and impacts of the proposed action alternative. None of the 29 proposed parking areas, unpaved roads and ORV ramps, foot paths, ADA accessible boardwalks, or road elevations would be constructed. ORV management on the Seashore would continue to be managed under the 2010 ORVMP/EIS without the public access facilities proposed under Alternative F of this plan. VFAs and ORV routes would continue to occur as outlined in Alternative F of the ORVMP/EIS. Seashore visitors would use existing ORV ramps and roads, boardwalks, and foot paths to access the beach. Visitor access to key recreational areas within the Seashore would not occur. ORV routes not accessible to ORVs would remain closed. Current safety issues, overcrowding, and visitor conflicts would remain the same.

## **ALTERNATIVE B: ACTION ALTERNATIVE (NPS PREFERRED ALTERNATIVE)**

Under this Alternative, the 29 proposed public access facilities including parking areas, unpaved ORV ramps and roads, foot paths, ADA accessible boardwalks, and elevation of a road segment would be constructed to facilitate visitor access to key recreational areas within the seashore (Figure 2.0). The proposed facilities would disturb up to 26 acres throughout the Seashore on Bodie, Hatteras, and Ocracoke Island, not including disturbance from proposed foot trails. To determine more specific locations for each proposed developments the following surveys were conducted:

- Wetland delineations were conducted on 28 of the 29 development locations in 2012 between July 16<sup>th</sup> and July 21<sup>st</sup> and on October 28<sup>th</sup> according to the Corps' 1987 Wetland Delineation Manual. The footprint for the proposed 50-car parking area and handicap accessible board walk at former Buxton Coast Guard Station was not surveyed because this area has been heavily disturbed and the Coast Guard was in the process of removing their facilities. The dunes in this area were recently reconstructed and re-vegetated.
- Vegetation surveys for federal and state listed vascular plant species were conducted in the summer of 2012 from June 14<sup>th</sup> to June 18<sup>th</sup>; July 14<sup>th</sup> to July 19<sup>th</sup>; and August 19<sup>th</sup> to August 23<sup>rd</sup>. The footprint for the proposed 50-car parking area and handicap accessible board walk at former Buxton Coast Guard Station was not surveyed because this area has been heavily disturbed and the Coast Guard was in the process of removing their facilities. The dunes in this area were recently reconstructed and re-vegetated.
- Archeological Surveys were conducted between January 7<sup>th</sup> and January 10<sup>th</sup>, 2013 at proposed beach access ramps, parking areas, and the interdunal road. Archeological surveys were not conducted at a proposed site if:
  - Ground disturbing activities are not proposed the site,
  - It was determined by the archaeologist that the area had been previously disturbed by humans (e.g. human created dune line), or
  - The site was in a wetland with standing water.

ORV use at the Seashore would continue to be managed under the 2010 ORVMP/EIS. The 29 developments were identified during the Cape Hatteras National Seashore ORVMP/EIS and through internal and public scoping. These facilities would enhance pedestrian access on the Seashore by providing increased parking capacity and ADA boardwalks at various points of access to VFAs and by increasing ORV access points to areas open to ORV use. A list of these projects with approximate acreage or length of the proposed project is provided in Table 2-1. Construction footprints for the individual developments are shown in Figure 2-1 to Figure 2-29 (NCDENR 2010, 2012; NCDA 2010; Kidd 2013; Krings 2012; Touchette 2012).

**Table 2-1. Facilities and Size**

Development Number	Facility	Size and/or length
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	.11 acre parking area
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	.03 acre boardwalk
3	Additional access road from NC 12 to fee station at Coquina Beach	.11 acre access road
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	.41 acre ORV ramp .19 acre parking area
5	A 10-car parking area at Ramp 4 with foot-trail to beach	.08 acre parking area 1800 ft. foot trail
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	.36 acre parking area .25 acre boardwalk
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	.31 acre parking area 1155 ft. foot trail
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	0.82 acre ORV ramp .20 parking area 960 ft. foot trail
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	.20 acre parking area 391 ft. foot trail
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	.62 acre ORV ramp .23 acre parking area 677 ft. foot trail
11	A handicap accessible boardwalk at Ramp 34	.16 acre boardwalk
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	.02 acre boardwalk
13	A 15-car parking area west side of highway at/near Kite Point	.29 acre parking area
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	.19 acre parking area
15	A 5-car parking area west side of highway at/near soundside access 60	.07 acre parking area
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	.06 acre boardwalk

Development Number	Facility	Size and/or length
17	A handicap accessible boardwalk at Lighthouse Beach	.07 acre boardwalk
18	A 3-car parking area at Loran Road with new handicap accessible boardwalk to the beach	.06 acre parking area .10 acre boardwalk
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	1.34 acres road elevation
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	15.24 acres IDR .43 ORV ramp
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	3.04 acres entire area
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	.03 acre boardwalk
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	.39 acre parking area
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	.08 acre boardwalk
25	An ORV Ramp 59.5 at north Ocracoke	.31 acre ORV ramp
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	.14 acre parking area
27	An ORV Ramp 63 across from Scrag Cedar Road	.17 acre ORV ramp
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	.02 acre boardwalk
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	.03 acre boardwalk

Funding for the proposed action would come from ORV permit fees established under the ORVMP/EIS. While this alternative analyzes implementing all 29 proposed developments, a decision on any one of these developments would not affect potential implementation of the other developments. Analyzing all 29 developments provides NPS with the maximum extent of possible adverse impacts or the worst case scenario. Facilities would be implemented based on funding, cost, and regulatory issues with the highest priority given to construction projects that provide access to areas of the beach that are closed to ORVs.

Ramps and parking areas would be constructed using best management practices and environmentally sensitive standards to minimize stormwater runoff. New ramps would be built between 24 feet to 36 feet wide and would consist of a pervious mixture of sand, shell, and clay. This sand/shell/clay mixture has been utilized successfully during ramp construction and/or rehabilitation at the National Seashore. The new ramps would also be constructed with a maximum slope of 5 percent and a vertical curve that would minimize ORVs (including trucks pulling trailers with low tire pressures) getting stuck at the crown of the ramp. To the extent possible, ramps would be constructed up and over

dunes and would not cut through a dune or raised area. Dunes may have to be re-shaped at a ramp to allow for proper drainage, safe driving conditions, and to reduce vehicle obstacles and impacts to vegetation. ORV speed would be limited to 15mph (unless otherwise posted). The interdunal road would be primitive in nature (for example, not paved or otherwise hardened) and would not require surfacing. The new access road from NC-12 to the fee station at Coquina Beach would be a two-lane asphalt paved road. Culverts would be placed along Lighthouse Road to restore the hydrology to the wetland areas that have been bisected by the road.

NPS would utilize any existing asphalt pavement at the proposed parking area locations. Asphalt would also be used to extend existing asphalt pavement. Asphalt would be used to extend the parking areas at both the former site of the U.S. Coast Guard Station on Bodie Island and at Ramp 49/Billy Mitchell Rd. The proposed development at Ramp 49 would also require some grading and fill for the pull out area but native materials would be used. The Seashore would also cut back the oaks in this area to make it more accommodating to visitors. The one way spur off of Ramp 49 would be constructed with the same material as the proposed ORV ramps. No additional asphalt would be used at the 50-car parking area at the former Buxton Coast Guard Station. For the remaining parking areas, a hardened pervious surface would be used that includes concrete or brick pavers typical to the area, or another suitable structural system that allows for drainage and minimum runoff. The unimproved 20-car parking area near the Pole Road/Spur Road intersection would only be accessible by 4-wheel drive vehicles and would not require a hardened surface because vehicles would travel over sand to reach them.

Boardwalks would be built 5 to 10 feet wide with treated wood framing and support members with a composite wood deck material. The minimum width is to comply with ADA regulations. The maximum width is to allow for any site specific conditions where a wider boardwalk would be preferred. The impacts in this document are determined assuming the maximum width. Each boardwalk could include a viewing platform, at the Park Supervisor's discretion. Each proposed boardwalk is of varying length given the site conditions, see Table 2-1. The boardwalk at the Loran Road parking area would be elevated high enough to allow for vegetation to receive sunlight. Foot trails would be marked, but the Seashore would not mow or maintain these areas.

Signs placed at facility locations would include 4 x 4 treated wood posts with metal signs. Construction crews would consist of four to eight man paving and general labor crew, both skilled and unskilled. Heavy equipment could include backhoes, dump trucks (10 tons), asphalt paving machines, motorgraders, or bulldozers (D4H). The facility management division at the Seashore would be responsible for all maintenance activities for the proposed action. Maintenance activities include routine maintenance and emergency repairs of beach ramps and parking areas and they would also be responsible for maintaining the vehicles used by law enforcement, resources management and other staff associated with the maintenance of these facilities. Additional staff time by facilities management would be required to establish and maintain the proposed action.

## Mitigation Measures

The proposed 29 public access facilities would avoid wetlands and sensitive plants to the extent possible. Construction activities would also avoid wetlands and use materials and management practices that would reduce surface runoff. To protect soundside wetlands and vegetation, protective signage would be installed at all soundside access points. Where needed, storm inlet protections would be utilized that would include surrounding inlets with metal posts, wire mesh, or 2 feet of #57 stone. The Seashore would use culverts for ramps, parking areas, and roads within wetlands along NC-12 ditches to maintain flow and avoid flooding. In the unlikely event that federally threatened or endangered, state-listed, or special status wildlife species are found in a construction area, the area would be under resource closure and no construction would occur. Construction activities would occur outside of the bird breeding season, during daylight hours, and outside of any protected species breeding or foraging habitat.

NPS would follow all standard safety and environmental requirements and guidelines set by North Carolina Department of Transportation (NCDOT) and/or North Carolina Department of Environment and Natural Resources (NCDENR). Construction fences (chain link or orange plastic fences with metal posts) and silt fences (typically 24 inch black fabric and metal posts) would be used during construction activities. Disturbance to wetlands and other sensitive resources would be avoided to the extent possible. In the case where mitigation for historical viewsheds or wetlands or other mitigation related item is needed, specific project related guidance would be identified and followed.

In areas with a high presence of the sensitive plant dune bluecurl, the Seashore would survey the extent of the population and establish resource closures along the proposed development to prevent pedestrian impacts to dune bluecurl populations. The Park would also collect and store enough seed for the propagation of 2,000 plants. The seeds would be collected in the fall after seeds ripen. Seeds would be collected from plants that would be at some of the proposed sites. These plants would be used to restore vegetation in areas impacted by inappropriate visitor use.

Spread of non-native, invasive plants would be prevented by following Best Management Practices outlined in USDA Forest Service's *Guide to Noxious Weed Prevention Practices*. Before construction begins, each project site would be surveyed for non-native plants. If plants are present, project operations would begin in uninfested areas before operating in infested areas. Equipment travel through infested areas would be avoided where possible. If operating in a site with non-native, invasive plants, equipment would be cleaned before leaving project site or taken to a designated site for cleaning. Workers should inspect, remove, and properly dispose of plant seeds and parts found on clothing and equipment. Proper disposal means bagging seeds and plant parts and incinerating them. Workers would ensure that any materials (sand, borrow, fill) taken off-site are free of non-native, invasive plant materials. Construction sites would be monitored after project completion for non-native plants; follow-up treatments would be conducted if necessary.



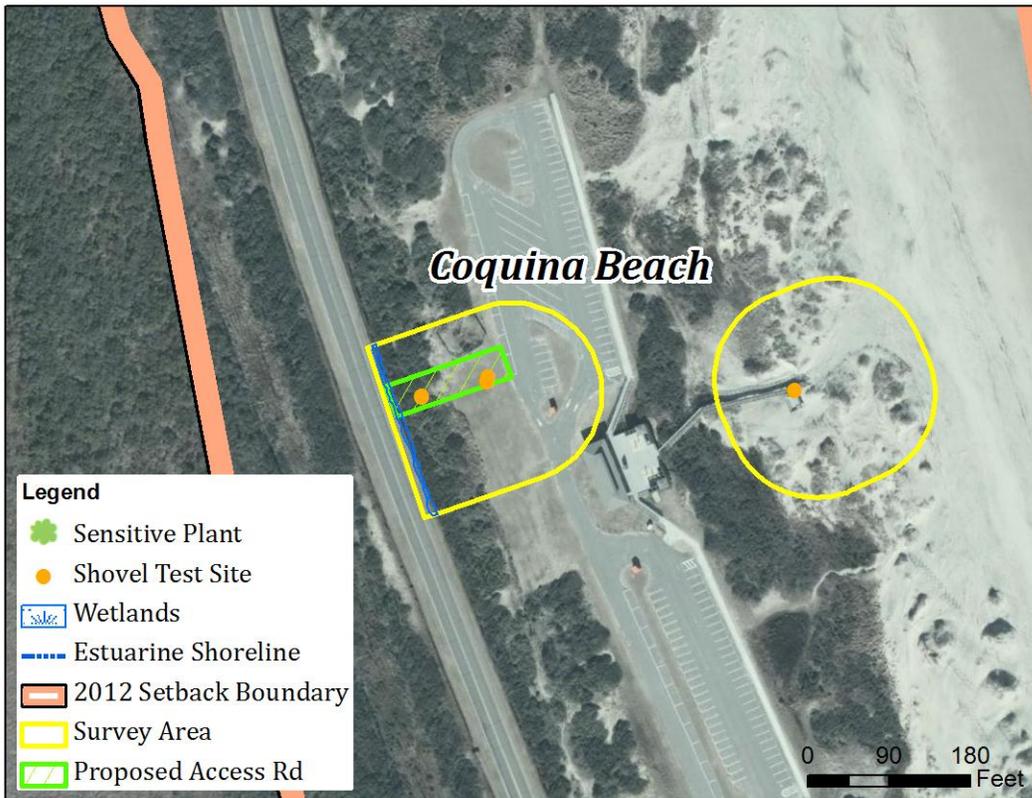
Figure 2-0. Locations of the 29 Proposed Public Access Facilities



**Figure 2-1. A 10-car parking area at the former U.S. Coast Guard Station on Bodie Island**



**Figure 2-2. ADA boardwalk at Coquina Beach**



**Figure 2-3. Additional access road at Coquina Beach**



**Figure 2-4. An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach**

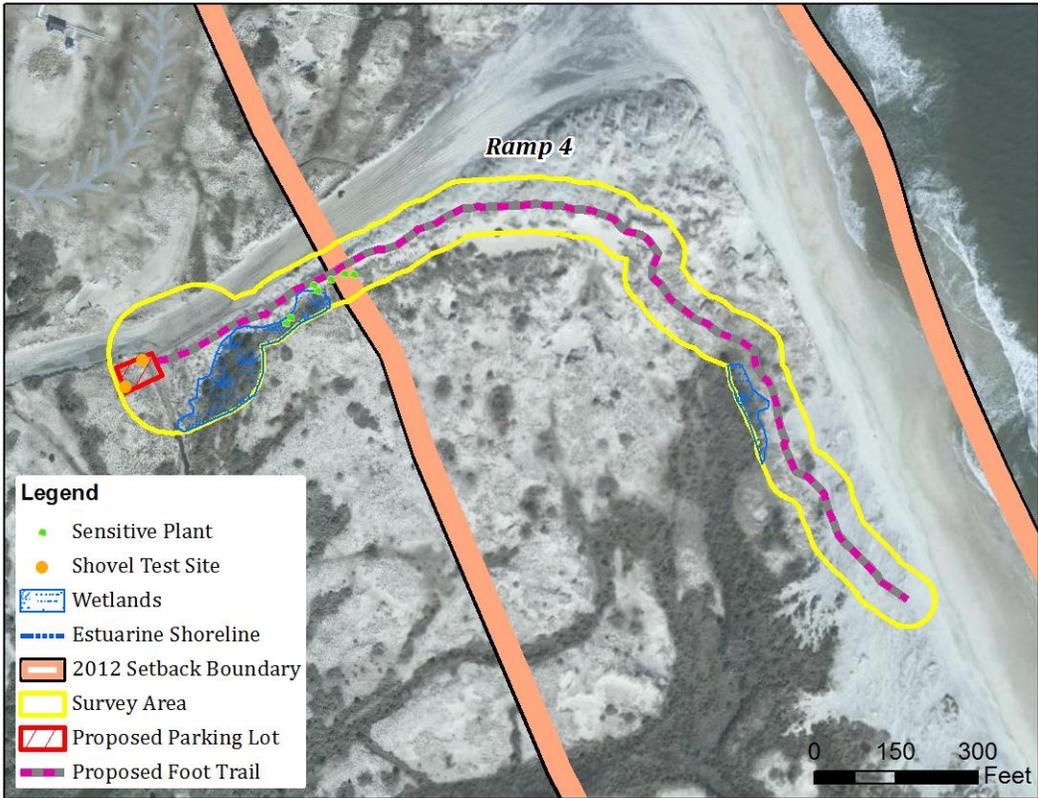


Figure 2-5 A 10-car parking area at Ramp 4 with foot-trail to beach

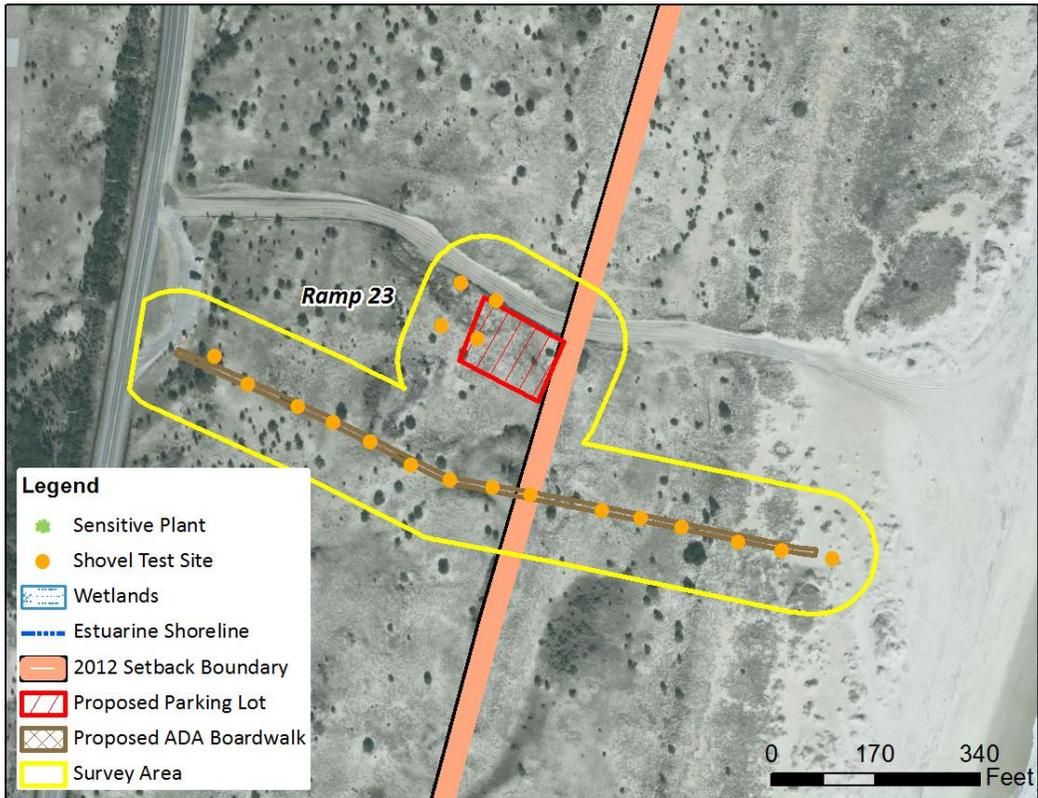
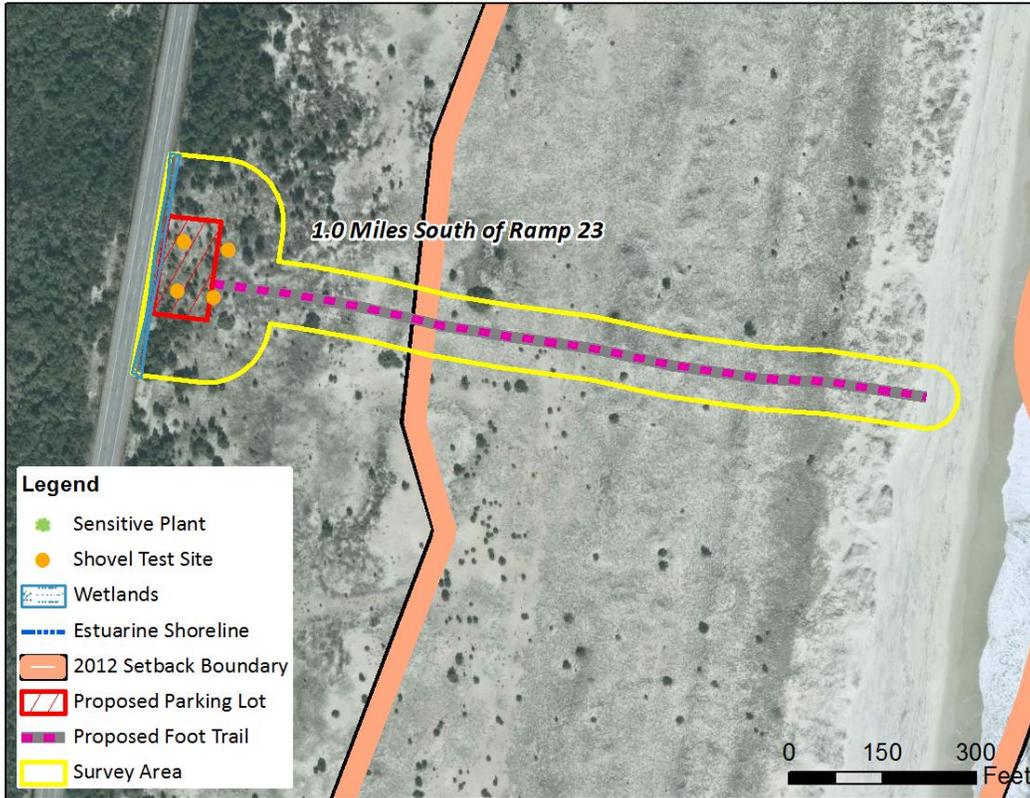
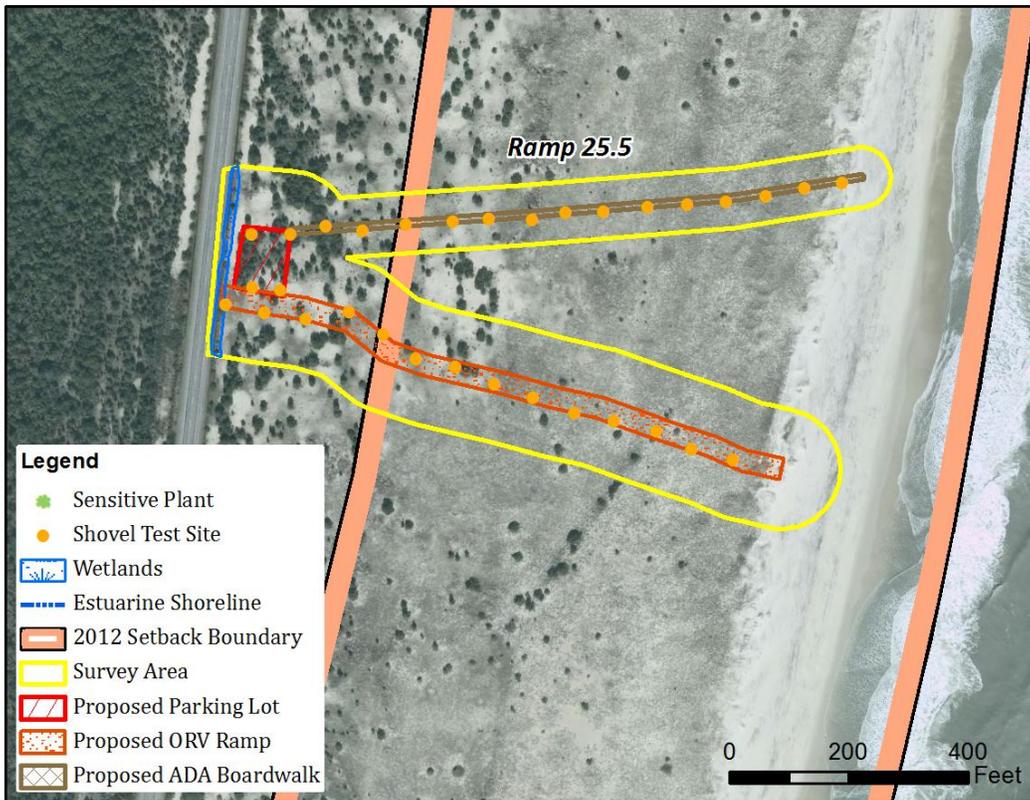


Figure 2-6. A 20-car parking area and ADA boardwalk at Ramp 23



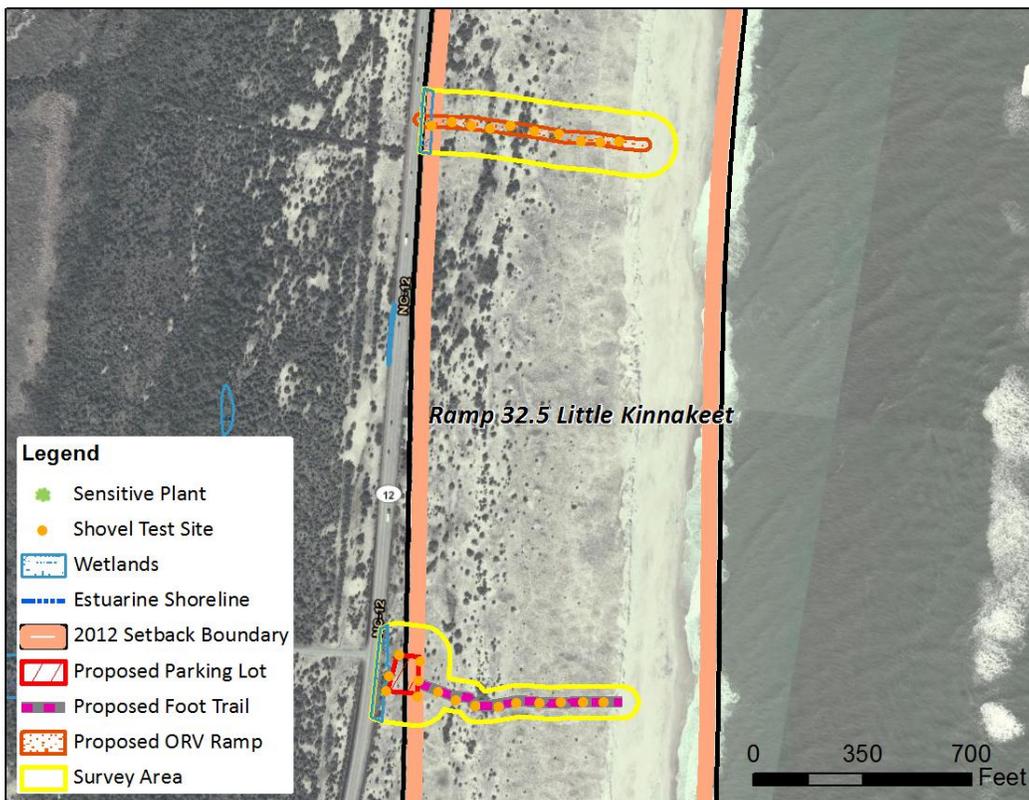
**Figure 2-7. A 10-car parking about 1.0 mile south of Ramp 23 with foot trail to the beach**



**Figure 2-8. An ORV Ramp 25.5 with foot trail or boardwalk to the beach**



**Figure 2-9. An A 5-car parking area (beachside) at soundside Ramp 48**



**Figure 2-10. ORV Ramp 32.5 with a 10-car parking area and foot trail to the beach**



Figure 2-11. ADA boardwalk at Ramp 34

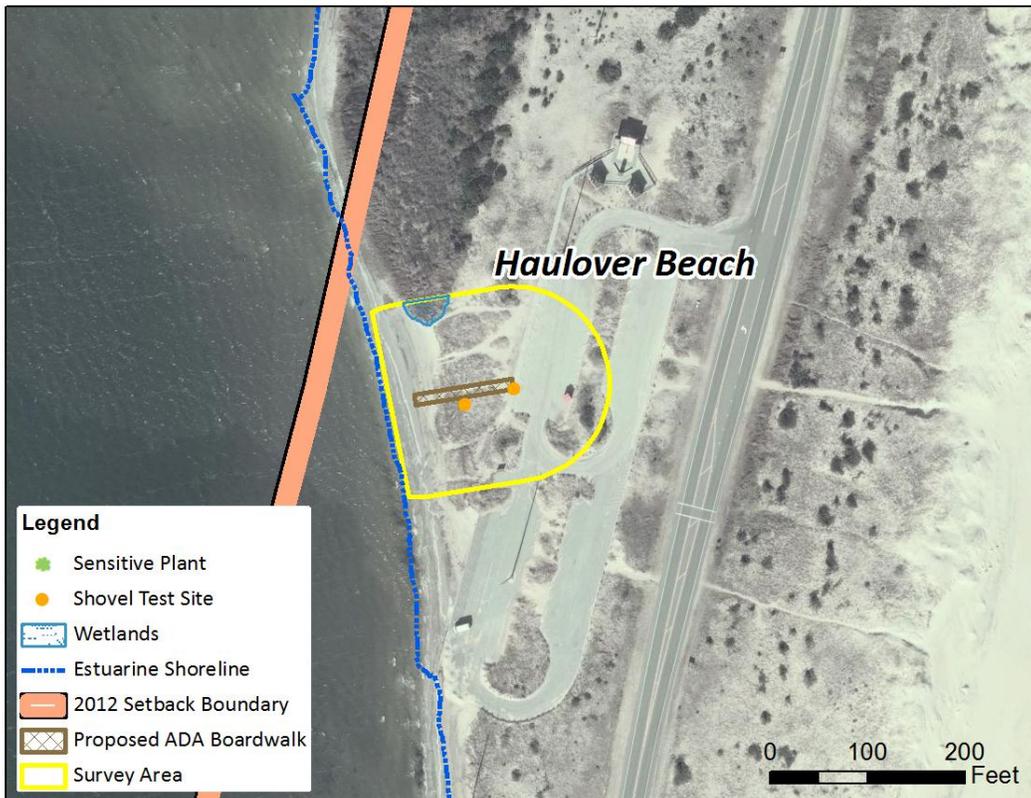


Figure 2-12. A handicap accessible boardwalk to sound at Haulover Beach Parking Area



**Figure 2-13. A 15-car parking area west side of highway at/near Kite Point**



**Figure 2-14. 15-car parking area at access #59 with foot trail from highway to beach**



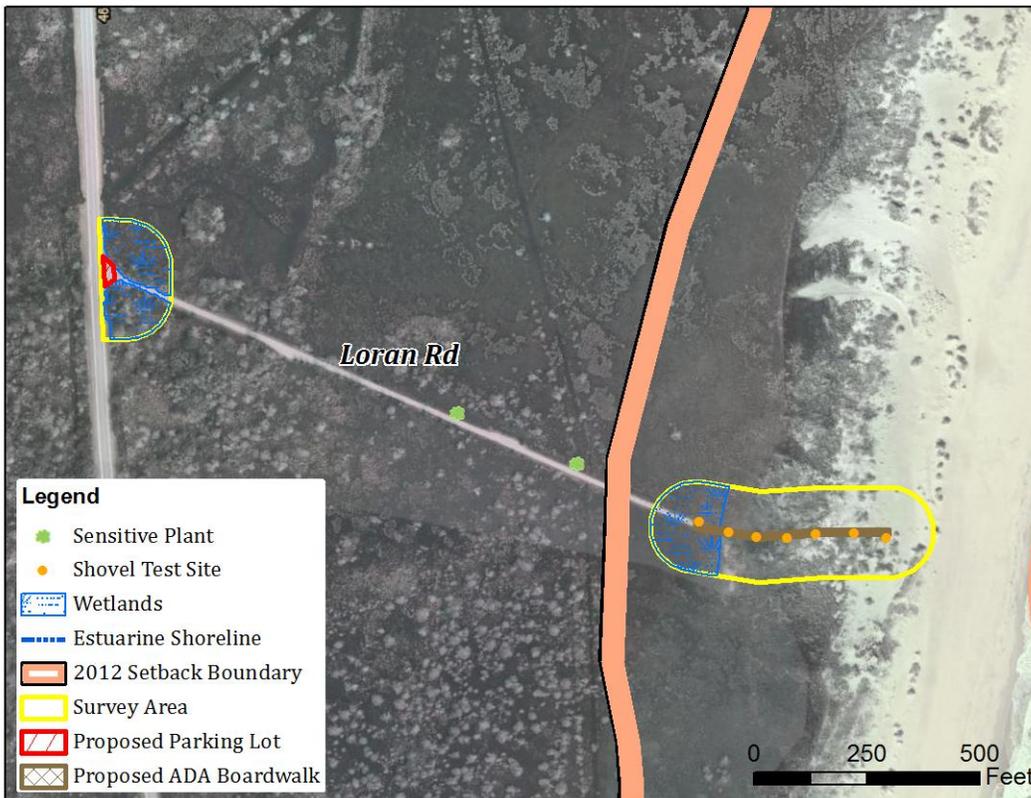
Figure 2-15. A 5-car parking area west side of highway at/near soundside access 60



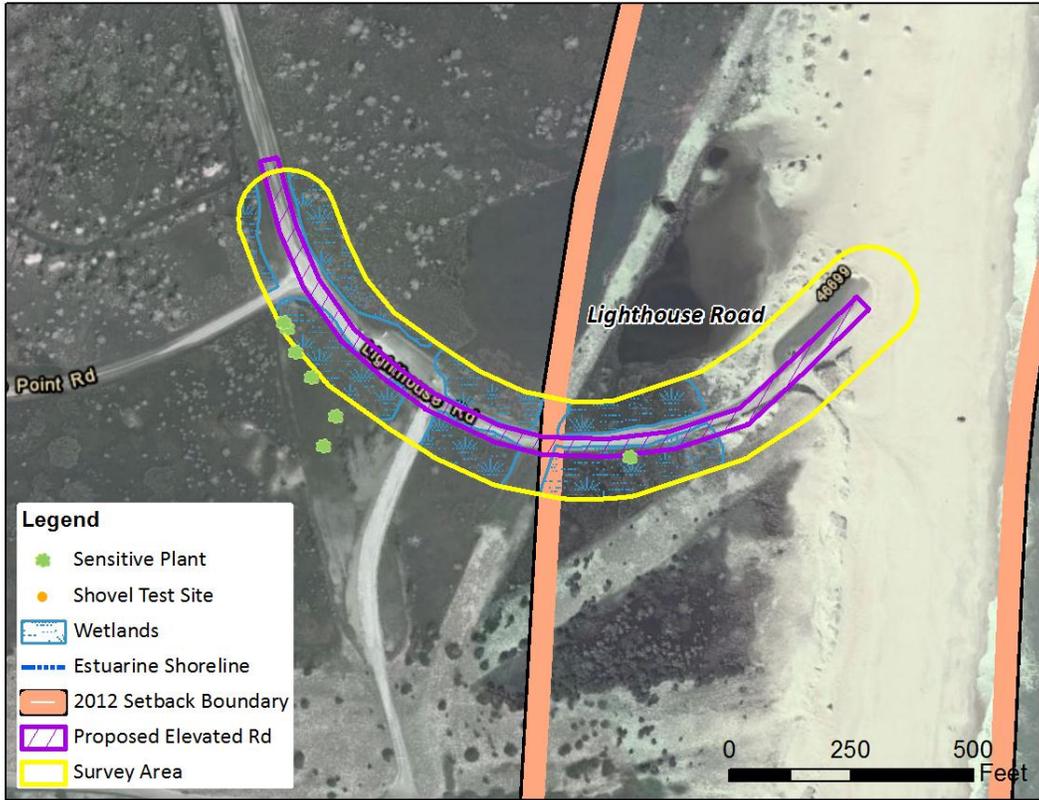
Figure 2-16. A 50-car parking area at Buxton Coast Guard Station and ADA boardwalk



**Figure 2-17. A handicap accessible boardwalk at Lighthouse Beach**



**Figure 2-18. 3-car parking area at Loran Road and ADA boardwalk to the beach**



**Figure 2-19. An elevated section of Lighthouse Road at ramps 43 and 44**

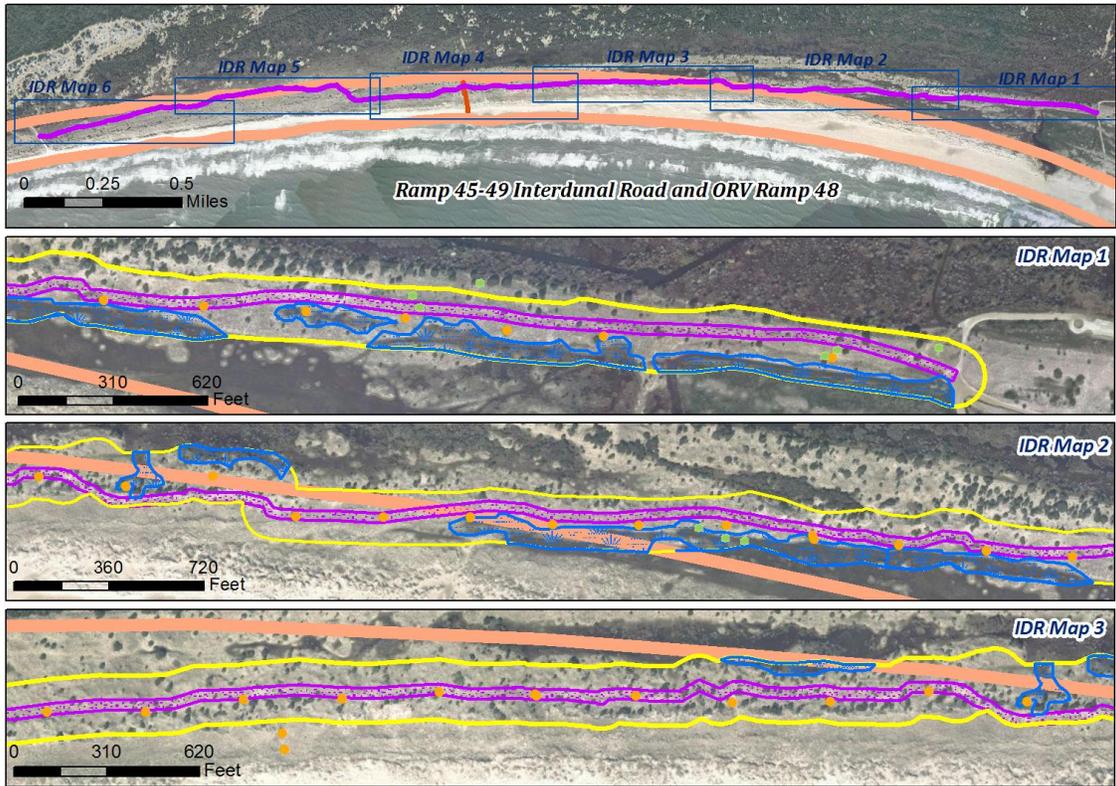
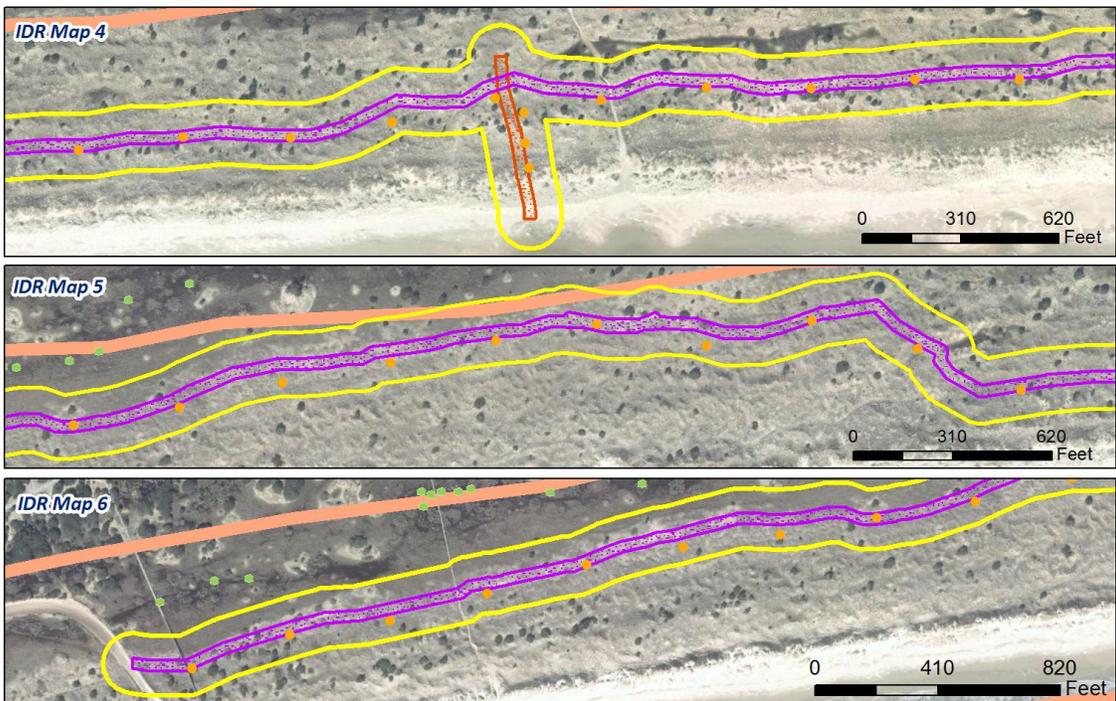


Figure 2-20A. An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach

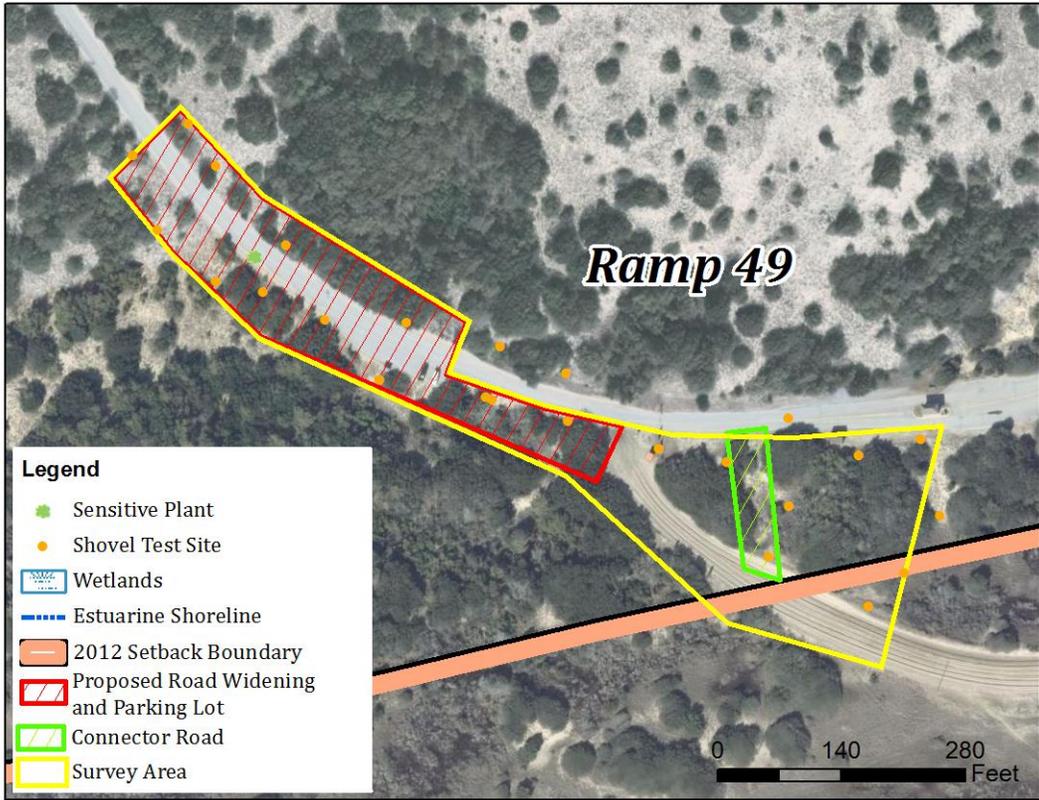


Legend

- Sensitive Plant\*
- 2012 Setback Boundary
- Wetlands
- Proposed Interdunal Rd
- Shovel Test Site
- Estuarine Shoreline
- Survey Area
- Proposed ORV Ramp

\*Trichostema sp. 1 was not mapped because thousands of individuals occur through the drier portions of the interdunal corridor (see vegetation report).

Figure 2-20b. An unpaved IDR between Ramp 45 and 49 with ORV Rmp 48 to the beach



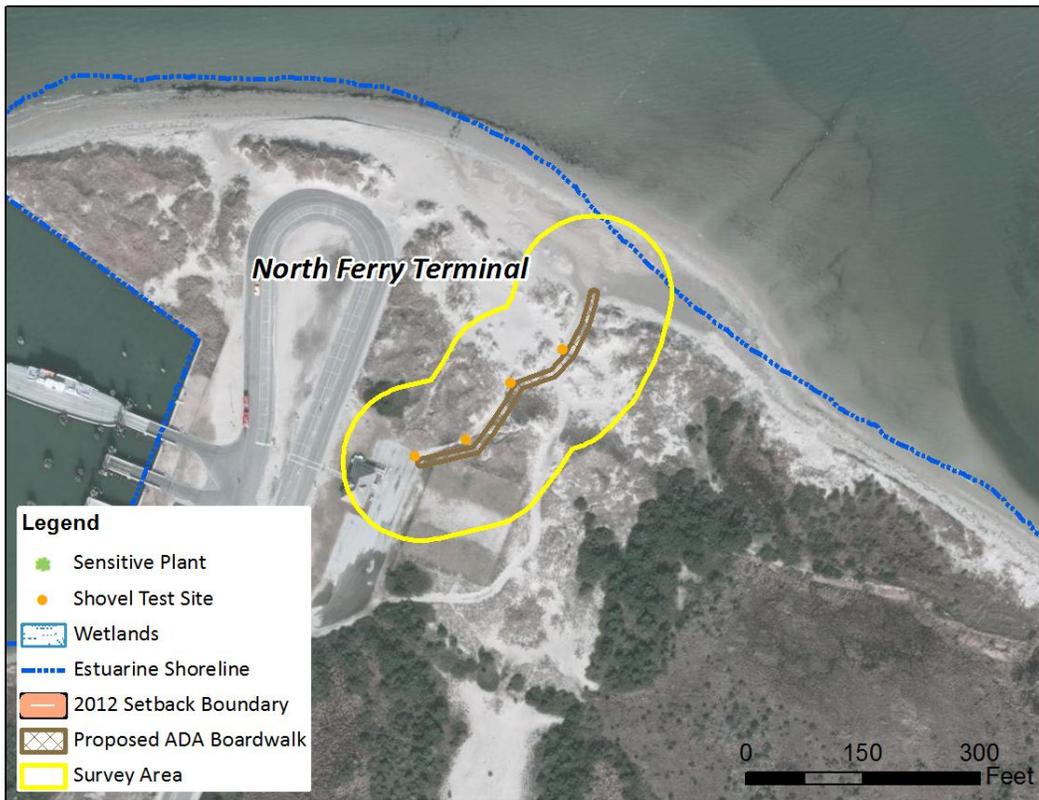
**Figure 2-21. Widen Ramp 49 with connector ramp and 5 car parking area**



**Figure 2-22. ADA accessible boardwalk at the Ramp 55 parking area on Hatteras Island**



**Figure 2-23. An unimproved 20-car parking area near the Pole Road/Spur Road**



**Figure 2-24. ADA boardwalk at/near north ferry terminal parking area on Ocracoke**



Figure 2-25. An ORV Ramp 59.5 at north Ocracoke



Figure 2-26. A 5-car parking area at west side of highway entrance of Borrow Pit Road



**Figure 2-27. An ORV Ramp 63 across from Scrag Cedar Road**



**Figure 2-28. ADA boardwalk at the Ocracoke Pony Pens**



**Figure 2-29. ADA boardwalk at the Ocracoke Day Use Area**

## **ALTERNATIVES AND ELEMENTS CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION**

### ***Air Stations***

NPS considered providing air stations on or near ORV ramps for ORV tire inflation when exiting the beaches as an element of the preferred alternative. NPS dismissed this as an element because local businesses provide free air stations for visitors of the Seashore. While the Seashore considered air stations in locations where there are no local businesses with free air stations within 15 to 20 miles of the proposed site, these areas have no source of power. Due to the costs of providing a power source, air stations are not being considered at this time.

### ***New Interdunal ORV route from Eastern Portion of Spur Road West Toward Inlet***

NPS considered constructing an interdunal ORV route from the eastern portion of Spur Road west towards Hatteras Inlet. NPS dismissed this as a potential project because the dune system at this location was altered in the fall of 2011 by Hurricane Irene. An interdunal ORV route is no longer possible from the eastern portion of Spur Road west toward the inlet.

### ***A seasonal foot trail approximately 1 mile south of Ramp 72***

NPS considered constructing a pedestrian trail to the Pamlico Sound approximately 1 mile south of Ramp 72. Prior to the fall of 2011 this portion of the sound was a popular area for Seashore visitors. This trail would have provided visitor access from the beach to the sound at this location. NPS dismissed this as a potential project because the soundside beach was washed out during Hurricane Irene.

### ***A relocation of soundside access 52 (Little Kinnakeet)***

NPS considered relocating the soundside access 52 north of the Little Kinnakeet Life Saving Station entrance. Seashore visitors accessing the sound at this location currently use the Little Kinnakeet Historic District access road. NPS originally proposed this project in order to minimize visitor conflicts between Little Kinnakeet Life Saving Station and soundside visitors. NPS dismissed this project because it is not feasible at this time. This project could be proposed in the future and would have its own NEPA document.

## **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

In accordance with DO-12, the NPS is required to identify the “environmentally preferred alternative” in all environmental documents, including EAs. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the CEQ. As stated in Section 2.7 (D) of the NPS DO-12 Handbook, “The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in NEPA (Section 101(b)).” This environmental policy is stated in six goal statements, which include:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural, and natural aspects of our national heritage, and maintain wherever possible, an environment which supports diversity and variety of individual choice;
- Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources (NEPA, 42 USC 4321-4347).

In sum, the environmentally-preferred alternative is the alternative that, not only results in the least damage to the biological and physical environment, but also that best protects, preserves, and enhances historic, cultural, and natural resources.

As evaluated against the CEQ regulations, Alternative 1, the No-Action, is the Environmentally Preferred Alternative as it would have no additional adverse environmental impact. Developing the 29 facilities under Alternative 2 would impact up to 26 acres throughout the Seashore, and it would impact wildlife and habitat; geology, topography, and soils; vegetation; water quality and estuarine resources; wetlands; floodplains; and human health and safety adversely. It would also impact floodplains, visitor use and experience, and human health and safety beneficially. Developing the proposed action would facilitate visitor access to key recreational areas on the Seashore, provide a variety of visitor use experiences, and minimize conflicts among various users.

## **SUMMARY OF ALTERNATIVES**

Tables 2-2 to 2-4 provide an overview of the impacts to each resource topic as a result of the no action and action alternative at each proposed facility as discussed in detail Chapter 4.

**Table 2-2. Summary of the Impacts of the Alternatives to Geology, Topography, and Soils, and Water Quality and Marine and Estuarine Resources**

Site no.	Facility	No Action Geology, Topography, and Soils	Proposed Action Geology, Topography, and Soils	No Action Water Quality/Marine and Estuarine Resources	Proposed Action Water Quality/Marine and Estuarine Resources
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	none	long-term negligible	none	short-term minor adverse
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	none	short-term minor adverse	none	long-term negligible
3	Additional access road from NC 12 to fee station at Coquina Beach	none	long-term negligible	none	long-term negligible
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	none	ORV Ramp: long-term moderate adverse Parking Area: long-term minor adverse	none	ORV Ramp: long-term negligible Parking Area: short-term minor adverse
5	A 10-car parking area at Ramp 4 with foot-trail to beach	none	Parking Area: long-term negligible Foot Trail: long-term minor adverse	none	Parking Area: short-term minor adverse Foot Trail: long-term negligible
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	none	Parking Area: long-term minor adverse Boardwalk: short-term minor adverse	none	Parking Area: long-term minor adverse Boardwalk: long-term negligible
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	none	Parking Area: long-term negligible Foot Trail: long-term minor adverse	none	Parking Area: short-term minor adverse Foot Trail: long-term negligible
8	An ORV Ramp 25.5 with parking area, and foot trail or	none	ORV Ramp: long-term moderate	none	ORV Ramp: long-term negligible Parking Area:

Site no.	Facility	No Action Geology, Topography, and Soils	Proposed Action Geology, Topography, and Soils	No Action Water Quality/Marine and Estuarine Resources	Proposed Action Water Quality/Marine and Estuarine Resources
	boardwalk to the beach		adverse Parking Area: long-term negligible Boardwalk: long-term negligible		short-term minor adverse Boardwalk: long-term negligible
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	none	Parking Area: long-term negligible Foot Trail: long-term minor adverse	none	Parking Area: long-term negligible Foot Trail: long-term negligible
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	none	ORV Ramp: long-term moderate adverse Foot Trail: long-term minor adverse Parking Area: long-term negligible	none	ORV Ramp: long-term negligible Foot Trail: long-term negligible Parking Area: short-term minor adverse
11	A handicap accessible boardwalk at Ramp 34	none	Boardwalk: short-term minor adverse	none	Boardwalk: long-term negligible
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	none	Boardwalk: short-term minor adverse	none	Boardwalk: long-term negligible
13	A 15-car parking area west side of highway at/near Kite Point	none	Parking Area: long-term negligible	none	Parking Area: short-term minor adverse
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	none	Parking Area: long-term negligible Foot Trail: long-term minor adverse	none	Parking Area: short-term minor adverse Foot Trail: long-term negligible
15	A 5-car parking area west side of highway at/near soundside access 60	none	Parking Area: long-term negligible	none	Parking Area: short-term minor adverse
16	A 50-car parking	none	Parking Area:	none	Parking Area:

Site no.	Facility	No Action Geology, Topography, and Soils	Proposed Action Geology, Topography, and Soils	No Action Water Quality/Marine and Estuarine Resources	Proposed Action Water Quality/Marine and Estuarine Resources
	area at the former Buxton Coast Guard Station with handicap accessible boardwalk		long-term negligible Boardwalk: short-term minor adverse		short-term minor adverse Boardwalk: long-term negligible
17	A handicap accessible boardwalk at Lighthouse Beach	none	Boardwalk: short-term minor adverse	none	Boardwalk: short-term minor adverse
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	none	Parking Area: long-term negligible Boardwalk: short-term minor adverse	none	Parking Area: short-term minor adverse Boardwalk: long-term negligible
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	none	long-term negligible	none	long-term negligible
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	none	long-term minor adverse	none	long-term negligible
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	none	long-term negligible	none	short-term minor adverse
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	none	Boardwalk: short-term minor adverse	none	Boardwalk: long-term negligible
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	none	long-term negligible	none	long-term negligible
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	none	Boardwalk: short-term minor adverse	none	Boardwalk: long-term negligible
25	An ORV Ramp 59.5 at north Ocracoke	none	ORV Ramp: long-term	none	ORV Ramp: long-term negligible

Site no.	Facility	No Action Geology, Topography, and Soils	Proposed Action Geology, Topography, and Soils	No Action Water Quality/Marine and Estuarine Resources	Proposed Action Water Quality/Marine and Estuarine Resources
			moderate adverse		
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	none	Parking Area: long-term negligible	none	Parking Area: short-term minor adverse
27	An ORV Ramp 63 across from Scrag Cedar Road	none	ORV Ramp: long-term moderate adverse	none	ORV Ramp: long-term negligible
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	none	Boardwalk: long-term negligible	none	Boardwalk: long-term negligible
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	none	Boardwalk: long-term negligible	none	Boardwalk: long-term negligible

**Table 2-3. Summary of the Impacts of the Alternatives to Vegetation, Wetlands, and the Floodplain**

Site no.	Facility	No Action Vegetation Impacts	Proposed Action Vegetation Impacts	No Action Wetlands and Floodplain Impacts	Proposed Action Wetland and Floodplain Impacts
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term moderate adverse
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Localized long-term negligible adverse	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none
3	Additional access road from NC 12 to fee station at Coquina Beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term moderate adverse
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term minor adverse
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
8	An ORV Ramp 25.5 with parking area, and	Localized long-term	Localized short- to long-	Wetlands: Localized long-	Wetlands: Localized short-

	foot trail or boardwalk to the beach	negligible to minor adverse	term minor adverse	term negligible to minor adverse Floodplains: none	and long-term minor adverse. Floodplains: Localized long-term minor adverse
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
11	A handicap accessible boardwalk at Ramp 34	None	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Localized long-term negligible to minor adverse	Localized short- to long-term negligible adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term negligible adverse Floodplains: none
13	A 15-car parking area west side of highway at/near Kite Point	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
14	A 5-car parking area west side of highway at/near soundside access 60	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
15	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse	Wetlands: Localized short- and long-term minor adverse.

				Floodplains: none	Floodplains: Localized long-term minor adverse
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Localized long-term negligible to minor adverse	Localized short- to long-term negligible adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
17	A handicap accessible boardwalk at Lighthouse Beach	Localized long-term negligible to minor adverse	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Localized long-term minor adverse
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Localized long-term negligible to minor adverse	Localized short-term moderate adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term minor adverse. Floodplains: Beneficial
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Localized long-term negligible to minor adverse	Localized long-term moderate adverse	Wetlands: Localized long-term negligible to minor adverse Floodplains: none	Wetlands: Localized short- and long-term negligible adverse Floodplains: none
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	None	Localized short- to long-term moderate adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term moderate adverse
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Localized long-term negligible to minor adverse	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term negligible adverse
24	A handicap accessible boardwalk at/near north	Localized long-term	Localized short- to long-	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none

	ferry terminal parking area on Ocracoke	negligible to minor adverse	term negligible adverse		
25	An ORV Ramp 59.5 at north Ocracoke	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term minor adverse
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term minor adverse
27	An ORV Ramp 63 across from Scrag Cedar Road	Localized long-term negligible to minor adverse	Localized short- to long-term minor adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplains: Localized long-term minor adverse
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	None	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	None	Localized short- to long-term negligible adverse	Wetlands: none Floodplain: none	Wetlands: none Floodplain: none

**Table 2-4. Summary of the Impacts of the Alternatives to Wildlife and Wildlife Habitat, Visitor Use and Experience, and Human Health and Safety**

Site no.	Facility	No Action Wildlife and Wildlife Habitat Impacts	Proposed Action Wildlife and Wildlife Habitat Impacts	No Action Visitor Use and Experience Impacts	Proposed Action Visitor Use and Experience Impacts	No Action Human Health and Safety Impacts	Proposed Action Human Health and Safety Impacts
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
3	Additional access road from NC 12 to fee station at Coquina Beach	none	Short- and long-term, localized, direct, negligible to minor, adverse.	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	none	Short- and long-term, localized, direct, minor, adverse	long-term negligible adverse	long-term beneficial and minor adverse	long-term minor adverse	long-term minor beneficial and short-term minor adverse
5	A 10-car parking area at Ramp 4 with foot-trail to beach	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	none	Short- and long-term, localized, direct, minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
7	A 10-car parking area about 1.0	none	Short- and long-term,	long-term negligible	long-term beneficial	long-term	long-term minor

Site no.	Facility	No Action Wildlife and Wildlife Habitat Impacts	Proposed Action Wildlife and Wildlife Habitat Impacts	No Action Visitor Use and Experience Impacts	Proposed Action Visitor Use and Experience Impacts	No Action Human Health and Safety Impacts	Proposed Action Human Health and Safety Impacts
	mile south of Ramp 23 with foot trail to the beach		localized, direct, minor, adverse	adverse		minor adverse	beneficial and short-term minor adverse
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	none	Short- and long-term, localized, direct, minor, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	none	Short- and long-term, localized, direct, minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
11	A handicap accessible boardwalk at Ramp 34	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
13	A 15-car parking area west side of highway at/near Kite Point	none	Short- and long-term, localized, direct, minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
14	A 15-car parking area at soundside access #59 with	none	Short- and long-term, localized,	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-

Site no.	Facility	No Action Wildlife and Wildlife Habitat Impacts	Proposed Action Wildlife and Wildlife Habitat Impacts	No Action Visitor Use and Experience Impacts	Proposed Action Visitor Use and Experience Impacts	No Action Human Health and Safety Impacts	Proposed Action Human Health and Safety Impacts
	foot trail from highway to beach		direct, negligible to minor, adverse				term minor adverse
15	A 5-car parking area west side of highway at/near soundside access 60	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
17	A handicap accessible boardwalk at Lighthouse Beach	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	none	Short- and long-term, localized, direct, negligible, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	none	Short- and long-term, localized, direct, negligible to minor, adverse	short-term moderate adverse	short-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	none	Short- and long-term, localized, direct, minor, adverse	long-term negligible adverse	long-term minor adverse and beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse

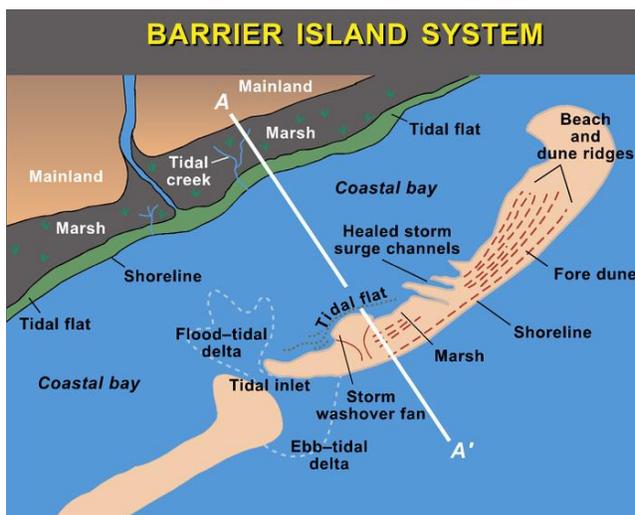
Site no.	Facility	No Action Wildlife and Wildlife Habitat Impacts	Proposed Action Wildlife and Wildlife Habitat Impacts	No Action Visitor Use and Experience Impacts	Proposed Action Visitor Use and Experience Impacts	No Action Human Health and Safety Impacts	Proposed Action Human Health and Safety Impacts
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	none	Short- and long-term, localized, direct, minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	none	Short- and long-term, localized, direct, negligible, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	none	Short- and long-term, localized, direct, negligible, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
25	An ORV Ramp 59.5 at north Ocracoke	none	Short- and long-term, localized, direct, minor, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	none	Short- and long-term, localized, direct, negligible to minor, adverse	long-term negligible adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
27	An ORV Ramp	none	Short- and	long-term	long-term	long-	long-term

Site no.	Facility	No Action Wildlife and Wildlife Habitat Impacts	Proposed Action Wildlife and Wildlife Habitat Impacts	No Action Visitor Use and Experience Impacts	Proposed Action Visitor Use and Experience Impacts	No Action Human Health and Safety Impacts	Proposed Action Human Health and Safety Impacts
	63 across from Scrag Cedar Road		long-term, localized, direct, negligible to minor, adverse	minor adverse	beneficial	term minor adverse	minor beneficial and short-term minor adverse
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	none	Short- and long-term, localized, direct, negligible, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	none	Short- and long-term, localized, direct, negligible, adverse	long-term minor adverse	long-term beneficial	long-term minor adverse	long-term minor beneficial and short-term minor adverse

## CHAPTER 3: AFFECTED ENVIRONMENT

### GEOLOGY, TOPOGRAPHY, AND SOILS

Cape Hatteras National Seashore, located on the Outer Banks, is on a series of wave dominated elongated barrier islands. Barrier islands are narrow strips of sand deposits that parallel the coastline and are formed as a result of wind and wave action. They are among the most dynamic natural landscapes as they tend to change shape and migrate rather quickly in response to sea level rise and fall, and to storm events through deposition and erosion processes. Barrier islands are part of a greater barrier island system that generally consists of the following features: beach, dunes, washover deposits, tidal inlets and deltas, tidal flats and marsh, and a protected bay (Figure 3.0). Daily tidal and wave action, as well as periodic storm surges move large amounts of sediment around the barrier island system. Waves hit the coast at an oblique angle creating a longshore sediment current. In the outer banks, while local directional switches can occur, the net movement of longshore sediment is from the north to south. The 29 developments are located on three barrier islands from North to South: Bodie, Hatteras, and Ocracoke and these islands are separated from the mainland by the Pamlico Sound.



**Figure 3.0 Barrier Island System (University of Texas at Austin, n.d.)**

The highest topographic features on the Outer Banks islands are the sand dunes, generally 10 to 20 feet above sea level (Dolan and Lins 1986). Lines of dunes occur in parallel rows immediately upland of the beach. The first line of dunes, primary dunes, is directly affected by waves, tides, and wind. Behind the primary dune line are back-dune areas that are sheltered from the direct effects of blown sand and salt-spray, except during storm events. Where the island is large enough the back-dune area may grade into a forest community. On the sheltered backside of the island an estuarine marsh habitat develops. Inlets are the primary means

by which sand is transported to the soundside of a migrating barrier island system. Inlets on the Outer Banks form when storm surge and high waves breach a channel and drive water across the islands to the sounds. Most inlets are temporary features of elevated water levels that last a few days. The inlets that stay open longer tend to move, migrate, and then close over time. Currently, the open inlets in the proposed action area are Oregon Inlet and Hatteras Inlet.

Soils in the project area include mostly quartz sand with some shell, gravel, and mineral deposits (Dolan and Lins 1986). The sedimentary layers have been deposited over time by storm overwash, tidal currents, and wind transportation. These sand deposits of the Outer Banks are moving landward overtime with rising sea level. This retrogradational movement of the barrier island has occurred throughout geological history when sedimentary supply is not large enough to match the rising sea. The landward migration is done by overwash of sand to the back side of the barrier. This happens because erosion lowers the barrier profile allowing for water to carry sand across the island. However, during the 1930's in the Outer Banks in 1930, a public works project was done to build dunes through sand fencing and vegetation planting resulting in dunes tall enough that overwash only occurred during very severe storms (Dolan and Lins 1986). Beaches bordered by the tall dune line were becoming narrower through sea level rise and storm driven waves. These continuing problems with erosion and overwash caused the Park Service to change their policy of sand building in the early 1970s and there were no further attempts to arrest the dynamics of the islands through dune stabilization (Dolan and Lins 1986). Currently, much of the Bodie, Hatteras, and Bodie islands are experiencing shoreline erosion with the exception at the south end of the islands where the inlets are migrating south (NCENR 2011). This is expected with longshore sediment transport depositing sediment from the north to the south ends of the islands.

## **WATER QUALITY/ MARINE AND ESTUARINE RESOURCES**

### **Applicable Policies**

North Carolina State Coastal Management Program policies that are relevant to Water Quality, and Marine and Estuarine Resources in the Cape Hatteras National Seashore are in the following sections of North Carolina Administrative Code: 15A NCAC 07M Section .0800 and NCAC 07H Section .0203.

#### ***Title 15 NCAC 07M—General Policy Guidelines for the Coastal Area***

##### **Section .0800—Coastal Water Quality Policies**

This section indicates that coastal waters are “a valuable natural and economic resource of statewide significance” and that traditional uses such as fishing, swimming, hunting, boating, and commerce depend upon the quality of these waters. Policies under this section declare that “no land or water use shall cause the degradation of water quality so as to impair traditional uses of the coastal waters.”

#### ***Title 15 NCAC 07H – State Guidelines for Areas of Environmental Concern (AEC)***

##### **Section .0206—Estuarine Waters**

It is the state's objective to conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system.

## Section .0209—Coastal Shorelines

The coastal shorelines category includes estuarine shorelines and public trust shorelines. Estuarine shorelines AEC are those non-ocean shorelines extending from the normal high water line or normal water line along the estuarine waters, estuaries, sounds, bays, fresh and brackish waters, and public trust areas as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Environment and Natural Resources for a distance of 75 feet landward.

The management objective related to this policy is to ensure that shoreline development is compatible with the dynamic nature of coastal shorelines as well as the values and the management objectives of the estuarine and ocean system. Other objectives are to conserve and manage the important natural features of the estuarine and ocean system so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing these shorelines so as to maximize their benefits to the estuarine and ocean system and the people of North Carolina.

### **Affected Environment**

Marine and estuarine resources around Cape Hatteras National Seashore include the marine water of the Atlantic Ocean to the east and south. To the west of Bodie Island is Roanoke Sound, and to the west and north of Hatteras and Ocracoke Island is Pamlico Sound. Both sounds are polyhaline, meaning they have salinities between 19-29 psu (NPS 2006c). The sound sides of the islands are a mixture of shallow bays, tidal creeks, and salt marsh. Tidal creeks occur on both Hatteras Island and Ocracoke Island. In addition man made ditches along NC-12 also impact the estuarine resources on Bodie Island and Ocracoke Island.

Water quality of these areas is currently impacted through nutrient and microbial pathogens from the developed towns and septic leachate outside of the park boundaries. The highest inputs occur along the drainage ditches on Bodie Island and Hatteras Island and the algae and macrophytes in those ditches absorb most of the nutrients so ocean beach waters have low potential for nutrient loading (NPS 2006c). Only at south beach near the town of Buxton have there been ocean beach closures near an outflow of a drainage ditch from excess enterococcus counts (NPS 2006c). There are no ocean discharges from drainage ditches on Ocracoke Island. On Ocracoke Island there are seven tidal creeks that intersect NC-12, and the automobile traffic crossing the creeks may cause elevation polycyclic aromatic hydrocarbon (PAC) loading to the creeks.

## **VEGETATION AND INVASIVE SPECIES**

### **General Vegetation**

This section provides a description of the major types of terrestrial vegetation that occur along the project corridor. This discussion is based on the results of three vegetation surveys conducted at the proposed sites. Three vegetation surveys were conducted in the spring and summer of 2012 at 28 of the 29 proposed sites. The proposed sites are within one or more of the following natural plant community types of North Carolina:

Dune Grass – Southern Subtype, Maritime Dry Grassland – Type Subtype, Maritime Shrub – Stunted Tree Subtype, Maritime Wet Grassland – Southern Hairgrass Subtype, Salt Shrub – High Subtype, and Upper Beach. A description of each community is described below. Plant community classification follows Schafale (2012). Conservation status was determined by querying the North Carolina Natural Heritage Program database (Krings 2012). Ranks follow Nature Serve:

- 1 = critically imperiled
- 2 = imperiled
- 3 = vulnerable
- 4 = apparently secure
- G = Global
- S = State

The Dune Grass – Southern Subtype is a grassy community that occurs on coastal foredunes and on dunes in the interior of barrier islands. These communities are influenced by salt spray and the absence of soil development. Dominant vegetation includes sea oats (*Uniola paniculata*), bitter panicgrass (*Panicum amarum*), largeleaf pennywort (*Hydrocotyle bonariensis*), trailing fuzzybeans (*Strophostyles helvula*), earleaf greenbrier (*Smilax auriculata*), and seaside goldenrod (*Solidago sempervirens*). The Southern Subtype is distinguished from other dune grass communities by the absence of shore little bluestem (*Schizachyrium littorale*) or American beachgrass (*Ammophila breviligulata*) though American beachgrass has been extensively planted in these areas (Schafale, 2012). This community does not occur north of Nags Head. This vegetative community has a conservation status of S2, G3 (Krings 2012).

Maritime Dry Grassland – Typic Subtype communities are found on sand flats in the interior and on the back side of barrier islands. Periodic salt water overwash and salt spray prevent woody vegetation development. Vegetation is typically sparse to moderate-density grassland dominated by saltmeadow cordgrass (*Spartina patens*) or other grasses not found in the Dune Grass community (Schafale 2012). This vegetative community has a conservation status of S2, G2G3 (Krings 2012).

Maritime Shrub – Stunted Tree Subtype are communities of shrub-sized vegetation of barrier islands and comparable coast lines. Vegetation is dominated or co-dominated by species capable of becoming larger trees but are kept at shrub size by salt spray. These species include live oak (*Quercus virginiana*), southern redcedar (*Juniperus virginiana* var. *Silicicola*), or swamp bay (*Persea palustris*) (Schafale 2012). This vegetative community has a conservation status of S2, G3 (Krings 2012).

Maritime Wet Grassland – Southern Hairgrass Subtype communities are found on the Outer Banks in interdune swales and low sand flats on barrier islands in areas with seasonally permanently saturated soils or shallow flooding but no regular salt water flooding. Vegetation is dominated by grasses or sedges including saltmeadow cordgrass and gulfhairawn muhly (*Muhlenbergia filipes*). Vegetation in these areas does

not include species of the Dune Grass community. This community is distinguished from the

Maritime Dry Grassland by the presence of wetland species, from the Brackish Marshes by the presence of salt-intolerant species, and from Interdune Marshes by the presence of small or medium size graminoids (Shafale 2012). This vegetative community has a conservation status of S2, G2 (Krings 2012).

Salt Shrub – High Subtype communities are found on high edges of salt marshes, infrequently flooded with salt water and dominated by the most salt-tolerant shrubs. Vegetation is dominated by eastern baccharis (*Baccharis halimifolia*), Jesuit's bar (*Iva frutescens*), and wax myrtle (*Morella cerifera*). Saltmeadow cordgrass can also be an important vegetative species in this community (Shafale 2012). This vegetative community has a conservation status of S4, G5 (Krings 2012).

Upper Beach communities cover sparsely vegetated areas between the unvegetated intertidal beach and the foredunes. These communities are distinguished from Dune Grass by the absence of significant cover of seaoats or of plants of other coastal communities. Its seaward edge is located where all vascular plants are absent. Vegetation is dominated either by American searocket (*Cakile edentula* ssp. *Edentula*) or Harper's searocket (*Cakile edentula* ssp. *harperi*) (Shafale 2012). The Upper Beach Northern Subtype has a conservation status of G4 (it is not tracked by the Natural Heritage Program) and the Upper Beach Southern Subtype has a conservation status of S3, G3 (Krings 2012).

Maritime Evergreen Forests are found on barrier islands and comparable coast lines and salt spray is the major environmental influence on these communities. Vegetation is dominated by a combination of live oak, Darlington oak (*Quercus hemisphaerica*), loblolly pine (*Pinus taeda*), and southern red cedar. Deciduous canopy trees are largely absent from these areas (Shafale 2012). This vegetative community has a conservation status of S2, G2 (Krings 2012). Table 3-1 lists the general vegetative communities found at each site.

### **State-Listed and Special Status Plant Species**

Some populations of flora have been, or are, in decline due to either natural forces or their inability to coexist with humans. This topic addresses plant species that are listed or recognized as special status species by the State of North Carolina but are not federally listed as endangered or threatened. Species identified as endangered, threatened, or special concern by the North Carolina Natural Heritage Program list of rare plant are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

The State Endangered Species Act provides for the conservation, management, enhancement, and protection of rare animal species in North Carolina. This law makes

it unlawful to possess or disturb, for any reason not approved by the North Carolina Wildlife Resources Commission, any animal species on the protected list.

The three vegetation surveys conducted in the summer of 2012 to identify federal and state listed vascular plant species that might be within and adjacent to the footprints of each of the 29 proposed projects. Survey target species were 32 federal and state listed vascular plants known from Dare and Hyde counties. State-listed vegetative species encountered in or adjacent to some of the proposed action footprints during the 2012 surveys were the state endangered *Dichanthelium caeruleascens* (blue witch grass), the state threatened *Ipomoea imperati* (beach morning-glory), the state rare plants *Trichostema* sp. 1 (dune blue curls) and *Yucca gloriosa* (moundlily yucca).

In North Carolina, blue witch grass is associated primarily with maritime wet grasslands, wet pinelands, and swamps. Dune blue curls, which is also currently a federal Species of Concern, remains undescribed, although a manuscript formally naming the species is in advanced stages of preparation (Krings 2012). The species is endemic to barrier islands from just north of Cape Hatteras to near Georgetown County, South Carolina and grows in dunes and sandy openings in maritime scrub. Beach morning glory and moundlily yucca reach the northern most extent of their North American distribution on the North Carolina Outer Banks. Beach morning glory is an evergreen perennial that rambles across sand dunes. Moundlily yucca grows on sand dunes along the coast and barrier islands of the southeastern U.S., often together with aloe yucca (*Yucca aloifolia*). Moundlily yucca may be confused with aloe yucca, but can be distinguished by its smooth leaf margins.

State-listed and special status plants were found at four of the proposed facility sites and outside of the footprint at three proposed sites. Table 3-1 lists the vegetative communities and state-listed and special status plants found at each proposed facility. Figures 2-1 to 2-29 show the location of sensitive plants for each of the 29 proposed developments.

**Table 3-1. Vegetation and Sensitive Plants at the 29 Development Sites**

Site no.	Facility	Vegetation Communities	Sensitive Plants
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	The dominant vegetative community surrounding the asphalt area is Maritime Shrub with Dune Grass communities present as you travel eastwards.	No sensitive plants were found at this location.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	The dominant vegetation communities are Dune Grass and Upper Beach.	No sensitive plants were found at this location.
3	Additional access road from NC 12 to fee station at Coquina Beach	The site is dominated by Maritime Shrub and the adjacent anthropogenic system represented by the maintained parking area margins and the vegetated islands within.	No sensitive plants were found at this location.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	As one moves eastward across the proposed ORV ramp footprint, vegetative communities change from Maritime Shrub to Dune Grass and finally to Upper Beach.	No sensitive plants were found at this location.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Vegetation within this area is dominated by Dune Grass in the west and Upper Beach in the east.	The state-listed mounds yucca was found at several locations within the area proposed for the foot trail.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Vegetation in this area is dominated by very open Maritime Shrub in the west that gives way eastwards to Maritime Dry Grassland, Dune Grass, and Upper Beach.	No sensitive plants were found at this location.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	From west to east, this area is dominated by Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach.	No sensitive plants were found at this location.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	From west to east, this area is dominated by Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach.	No sensitive plants were found at this location.
9	A 5-car parking	From west to east, this area is	No sensitive plants were

Site no.	Facility	Vegetation Communities	Sensitive Plants
	area and foot trail to beach (beachside) at soundside Ramp 48	dominated by Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach	found at this location.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	From west to east, this area is dominated by Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach.	No sensitive plants were found at this location.
11	A handicap accessible boardwalk at Ramp 34	From west to east, this area is dominated by Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach.	No sensitive plants were found at this location.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	The vegetation on this footprint is rather unprotected and disturbed in places. The dominate vegetation is seaoats and the plant community most closely resembles Dune Grass.	No sensitive plants were found at this location.
13	A 15-car parking area west side of highway at/near Kite Point	The vegetation on this footprint is rather unprotected and disturbed in places. The dominate vegetation is seaoats and the plant community most closely resembles Dune Grass.	No sensitive plants were found at this location.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	The vegetation on this footprint is rather unprotected and disturbed in places. The dominate vegetation is seaoats and the plant community most closely resembles Dune Grass.	No sensitive plants were found at this location.
15	A 5-car parking area west side of highway at/near soundside access 60	The eastward most edge of this footprint is dominated by a disturbed community closely resembling Dune Grass. With decreasing elevation and increasing wetness towards the west, the vegetation tends toward Salt Shrub.	No sensitive plants were found at this location.
16	A 50-car parking area at the former Buxton Coast	The footprint for the proposed project is dominated by asphalt from the former Buxton Coast	Proposed construction would be on asphalt from the former Buxton Coast Guard

Site no.	Facility	Vegetation Communities	Sensitive Plants
	Guard Station with handicap accessible boardwalk	Guard Station. Vegetation was not surveyed at this location.	Station. Vegetation was not surveyed at this location.
17	A handicap accessible boardwalk at Lighthouse Beach	Surrounding vegetation is dominated by Dune Grass and Upper Beach communities. Vegetation between parking areas is dominated by Bermudagrass ( <i>Cynodon dactylon</i> ) while the remaining area is primarily open sand.	No sensitive plants were found at this location.
18	A 3-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Vegetative communities present around the proposed parking area include Maritime Shrub and Maritime Wet Grassland. Vegetative communities surrounding the proposed handicap accessible boardwalk include Maritime Wet Grasslands to the east, changing progressively eastwards to Maritime Dry Grassland, Dune Grass, and Upper Beach.	While sensitive plants are not located within the proposed projects, they are located between the proposed parking area and proposed boardwalk and include blue witch grass and dune bluecurls.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Vegetation surrounding the road is comprised of Maritime Wet Grasslands in the east, progressively changing eastwards to Maritime Dry Grassland, Dune Grass, and Upper Beach communities.	State-listed plants encountered surrounding Lighthouse road include blue witch grass and moundlily.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	This area is generally comprised of Maritime Shrub changing toward the ocean to either Maritime Wet Grassland or Maritime Dry Grassland (depending on the topography of the area), then to Dune Grass, and finally to Upper Beach.	State-listed plant species found within or adjacent to this area include blue witch grass, dune bluecurls, and moundlily yucca. High numbers of dune bluecurls were found in this location (dune blue curls were not mapped due to the high number of individuals).
21	Widen Ramp 49 and add connector road and 5 car parking area to	Vegetative communities adjacent to Ramp 49 and Billy Mitchell Road include Maritime Shrub or Maritime Evergreen Forest, with small	The state-listed rare plant species dune bluecurls was encountered at this location during 2012 surveys. While

Site no.	Facility	Vegetation Communities	Sensitive Plants
	Billy Mitchell Rd. near Frisco Campground	canopy openings that exhibit vegetation similar to Maritime Dry Grassland or Dune Grass.	one location was mapped this species occurs along both sides of the road leading up to the existing parking area.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	The surrounding vegetation is dominated by Dune Grass, changing to Upper Beach, as one approaches the ocean	No sensitive plants were found at this location.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	The vegetation within and surrounding this footprint is dominated by Maritime Dry Grassland communities	No sensitive plants were found at this location. However, blue dune curls are located north of the footprint of the proposed project.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	The area surrounding the proposed boardwalk includes a parking area as well as a fenced enclosure. Where vegetation occurs it is dominated by Dune Grass and/or Upper Beach communities	No sensitive plants were found at this location.
25	An ORV Ramp 59.5 at north Ocracoke	The vegetation within and surrounding the footprint is comprised of Maritime Shrub, Changing to Dune Grass and Upper Beach towards the Atlantic	No sensitive plants were found at this location.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	The vegetation within and surrounding the footprint is dominated by Maritime Dry Grasslands	No sensitive plants were found at this location.
27	An ORV Ramp 63 across from Scrag Cedar Road	The vegetation within the footprint and surrounding area is comprised of Dune Grass and Upper Beach communities.	No sensitive plants were found at this location.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	NPS proposes to extend the handicap accessible boardwalk at Pony Pens on Ocracoke Island. The vegetation within the footprint is comprised of Dune Grass and Upper Beach communities.	No sensitive plants were found at this location.
29	A handicap	The vegetation within the footprint	A well-established

Site no.	Facility	Vegetation Communities	Sensitive Plants
	accessible boardwalk at the Ocracoke Day Use Area	and surrounding area is comprised of Dune Grass and Upper Beach.	occurrence of the state-listed beach morning-glory was surveyed to the north of the proposed boardwalk.

## WETLANDS

Cape Hatteras National Seashore is home to a number of unique aquatic wetland ecosystems. Wetlands surveys were conducted according to the U.S. Army Corps of Engineers (USACE) 1987 wetland delineation procedures for 28 of the 29 proposed projects between July 16<sup>th</sup> and July 21<sup>st</sup>, 2012. Wetlands include areas inundated or saturated by surface or groundwater for sufficient length of time during the growing season to develop and support characteristic soils and vegetation. The NPS classifies wetlands based on the United States Fish and Wildlife Service (USFWS) Classification of Wetlands and Deepwater Habitats of the United States (the Cowardin classification system). Based on this classification system, a wetland must have one or more of the following attributes:

- The habitat at least periodically supports predominantly hydrophytic (wetland) vegetation.
- The substrate is predominantly undrained hydric soil.
- The substrate is non-soil and saturated with water, or is covered by shallow water at some time during the growing season (Cowardin et al. 1979).

While the majority of the undeveloped acreage within the Seashore can be classified as a wetland with the predominant wetland types at the seashore being marine and estuarine (NPS 2010), palustrine wetlands were encountered at some of the proposed project sites. Wetland types within and adjacent to the proposed projects include palustrine emergent persistent, palustrine scrub-shrub, estuarine emergent persistent, and estuarine intertidal scrub-shrub (Touchette 2012).

Palustrine wetlands include all non-tidal wetlands dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 percent. It also includes wetlands lacking such vegetation, but with all the following four characteristics: (1) area less than 20 acres; (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of the basin less than 2 meters at low water; and (4) salinity due to ocean-derived salts less than 0.5 percent (Cowardin et al. 1979).

Estuarine wetlands include deepwater tidal habitats and adjacent tidal wetlands that are usually semi-closed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water (Cowardin et al. 1979).

Wetlands provide substantial environmental and economic benefits to the Seashore and surrounding areas of coastal North Carolina. For example, wetlands trap sediment and pollutants from stormwater runoff and provide a natural filter before this runoff can enter local waterways. Wetlands also store large volumes of water and function like sponges to reduce the likelihood of flooding during storm events. Wetlands also protect the shoreline from erosion and provide excellent habitat for fish and wildlife species, many of which are threatened or endangered (NPS 2010).

Table 3-2 describes the wetlands present at each proposed facility. See Figures 2-1 to 2-29 for the locations of wetlands at each proposed site.

**Table 3-2. Description of Wetlands at each Proposed Project**

Site no.	Project	Wetlands
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Palustrine emergent persistent wetlands in drainage ditch along NC-12 and within slight depression dominated by grasslands surrounding the asphalt area.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Wetlands are not present at this location.
3	Additional access road from NC 12 to fee station at Coquina Beach	Palustrine emergent persistent wetland present within drainage ditch along NC-12.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Palustrine emergent persistent wetland present within drainage ditch along NC-12.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Palustrine emergent persistent wetland present near proposed parking area.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Wetlands are not present at this location.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Palustrine emergent persistent wetland present in drainage ditch along NC-12.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Palustrine emergent persistent wetland present in drainage ditch along NC-12.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Palustrine emergent persistent wetland present in drainage ditch along NC-12.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Palustrine emergent persistent wetland present in drainage ditch along NC-12.
11	A handicap accessible boardwalk at Ramp 34	Wetlands are not present at this location.

Site no.	Project	Wetlands
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Estuarine emergent persistent wetlands are present in a small high marsh plant community located north of the proposed boardwalk footprint.
13	A 15-car parking area west side of highway at/near Kite Point	Estuarine intertidal scrub-shrub wetland areas are located near the proposed parking area footprint in low lying mixed grass-thicket near the sound.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Estuarine intertidal scrub-shrub wetlands present in small grass-thicket areas just above the high tide mark north and south of the proposed parking area footprint.
15	A 5-car parking area west side of highway at/near soundside access 60	Palustrine scrub-shrub wetlands are present in mixed low-lying shrub thickets and estuarine emergent persistent wetlands are located within high marsh system surrounding the proposed parking area footprint on the sound side.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Wetland surveys were not conducted at this site. According to the National Wetlands Inventory Data there are freshwater emergent wetlands located on the opposite side of the freshwater pond adjacent to the proposed parking area. Freshwater forested-shrub wetlands are also located west of the proposed parking area (USFWS 2009).
17	A handicap accessible boardwalk at Lighthouse Beach	Wetlands are not present at this location.
18	A 3-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Both palustrine scrub-shrub and palustrine emergent persistent wetlands are located within this location either surrounding the proposed parking area or within the boardwalk footprint.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Palustrine emergent persistent wetlands are present along Lighthouse road at this location.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Palustrine scrub-shrub and palustrine emergent persistent wetlands present on either side of the proposed IDR footprint.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Wetlands are not present at this location.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Wetlands are not present at this location.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Palustrine scrub-shrub and palustrine emergent persistent wetlands are present west of the proposed footprint.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Wetlands are not present at this location.

Site no.	Project	Wetlands
25	An ORV Ramp 59.5 at north Ocracoke	Wetlands are not present at this location.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Wetlands are not present at this location.
27	An ORV Ramp 63 across from Scrag Cedar Road	Wetlands are not present at this location.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Wetlands are not present at this location.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Wetlands are not present at this location.

(Touchette 2012; USFWS 2009).

## **FLOODPLAINS**

North Carolina's barrier islands have historically been and continue to be affected by coastal forces and flooding events. The barrier islands that comprise the Seashore are relatively flat and narrow and lie adjacent to the shallow and wide Pamlico Sound. The widest part of the Seashore islands is near Cape Point, between Buxton and Frisco (Pendleton et al. 2005; NPS 2010). According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, the proposed project locations are within the 100-year floodplain, with the exception of some areas within the 500-year floodplain (Shaded X Zone).

Generally, lands along the ocean beaches and adjacent to the sound (at wide points) are in flood zone "VE," which is the flood insurance rate zone that corresponds to 100-year coastal floodplains that have additional hazards associated with storm waves. Zone "VE" is also referred to as the "Coastal High Hazard Area." The remainder of the Seashore that is mainly located within the 100-year floodplain and not directly adjacent to the ocean or sound lies within the "AE" zone, which is subject to waves less than 3 feet high (NCDCCPS 2008; NPS 2010). Because the Seashore is almost entirely within the 100-year floodplain and is subject to high water table conditions and high wave action, many areas are subject to drainage and flooding problems that often result from storm events (NPS 2010).

The highest topographic features on the Outer Banks islands are sand dunes usually 10 to 25 feet above sea level. Lines of dunes occur in parallel rows immediately upland of the beach. The first line of dunes, primary dunes, is directly affected by waves, currents, and wind. Behind the primary dune line are back-dunes areas that are sheltered from the direct effects of blown sand and salt-spray, except during storm events. The enhanced dune system along the Seashore provides protection of backdune areas from flooding during smaller storms. Eventually, however, a major storm could occur and flood the area. Since the islands are located in the 100-year floodplain, it would be subject to periodic flooding in the VE and AE zones assigned by FEMA. There is a 1% chance that such an event would be equaled or exceeded in any given year. During such an event, the backdune area could potentially be washed completely away or greatly reduced, depending on the nature of the individual storm. The main effect on dunes would be associated with overwash.

All of the parking areas would be located within the 100-year floodplain, with none of the new or expanded lots located in areas seaward of the primary dune line. New or expanded parking areas are outside of the Coastal High Hazard Flood Area subject to flash flooding, were possible. Table 3-3 describes the floodplain zone at each proposed facility (FEMA n.d.).

**Table 3-3. Description of the Floodplain at each proposed Facility**

Site no.	Facility	Flood Zone
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Zone VE
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Zone VE
3	Additional access road from NC 12 to fee station at Coquina Beach	Zone AE
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Zone VE
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Proposed parking area would be located in Zone AE and the proposed foot trail would be located in Zone VE.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Proposed parking area would be located in Zone AE and the proposed boardwalk would be located in both Zone AE and VE.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Proposed parking area would be located in Zone AE and the proposed foot trail would be located in both Zone AE and VE.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Proposed parking area would be located in Zone AE, the proposed ramp would be located in both Zone AE and VE, and the proposed foot trail would be located in both Zone AE and VE.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Proposed parking area would be located in Zone AE and the proposed foot trail would be located in both Zone AE and VE.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	The proposed parking area would be located in Zone AE and the foot trail would be located in both Zone AE and VE.
11	A handicap accessible boardwalk at Ramp 34	Zone AE and VE
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Zone VE
13	A 15-car parking area west side of highway at/near Kite Point	Zone AE
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Zone AE
15	A 5-car parking area west side of highway at/near soundside access 60	Zone VE
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Zone AE
17	A handicap accessible boardwalk at Lighthouse Beach	Zone VE

Site no.	Facility	Flood Zone
18	A 3-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Zone AE
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Zone AE
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Zone X and VE
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Zone X and AE
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Zone VE
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Zone AE
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Zone VE
25	An ORV Ramp 59.5 at north Ocracoke	Zone VE
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Zone VE and AE
27	An ORV Ramp 63 across from Scrag Cedar Road	Zone AE and VE
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Zone VE
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Zone VE

(FEMA, n.d.)

## WILDLIFE AND WILDLIFE HABITAT

The Seashore supports a vast array of wildlife in its aquatic and terrestrial habitats. Shellfish, crabs, cottonmouth snakes, waterfowl, wading birds, and nutria are frequently encountered in the tidal marshes, while the green anoles, black rat snakes, and white-tailed deer scatter across the land. Existing wildlife resources reflect the presence of several vegetative zones throughout the Seashore. This variety of vegetative communities provides habitat for many faunal species, some dependent on specific vegetative types and other benefiting from an ability to use multiple communities.

There are nearly 400 documented bird species that use the Seashore's habitats for nesting, resting, or feeding. Located on a major avian migratory route known as the Atlantic Flyway, the Seashore was designated as a Globally Important Bird Area (IBA) in 1999 by the American Bird Conservancy in recognition of the value the Seashore provides to bird migration, breeding, and wintering. For a site to be included, it must, during at least some part of the year, contain critical habitat that supports (1) a significant population of an endangered or threatened species (2) a significant population of a U.S. Watch List species (3) a significant population of a species with a limited range or (4) a significantly large concentration of breeding, migrating or wintering birds, including waterfowl, seabirds, wading birds, raptors or landbirds. The goal of the IBA program is not just to recognize the sites as important, but to mobilize the resources needed to protect them. The IBA designation is an important first step in raising awareness among the public, and among land managers, to the importance of each site and its value to bird conservation.

Migratory birds are often found at the Seashore throughout the year. During the winter months, the common loon (*Gavia immer*), pied-billed grebe (*Podilymbus podiceps*), northern gannet (*Morus bassanus*), tundra swan (*Cygnus columbianus*), and Canada goose (*Branta canadensis*) are common sights at the Seashore. During the summer migratory season, several varieties of herons (*Ardea* spp.), Audubon's shearwater (*Puffinus lherminieri*), and the barn swallow (*Hirundo rustica*) populate the Cape Hatteras shores. While less frequently sighted, grebes (*Podiceps auritus*), mallard ducks (*Anas platyrhynchos*), hawks (genus *Accipiter*), bald eagles (*Haliaeetus leucocephalus*), peregrine falcons, and various species of sandpipers also inhabit the Seashore at one point or another throughout the year. Studies have demonstrated the importance of the Outer Banks as a staging area for piping plovers, whimbrels, and sanderlings when compared to other areas along the Atlantic Coast and confirmed that the area provides a critical link in the migratory path of several shorebird species (NPS 2010). The marshes on the sound side of Ocracoke Island, provide a wintering home for significant numbers of waterfowl and shorebirds. Inlet areas, recently overwashed beaches, and estuarine islands are important nesting sites for terns (*Sterna* spp.) and skimmers (*Rhynchops* spp.).

Other avian species likely to occur throughout the Seashore include the rufous-sided towhee (*Pipilo erythrophthalmus*), northern cardinal (*Cardinalis cardinalis*), American and fish crows (*Corvus brachyrhynchos* and *Corvus ossifragus*, respectively), and

various sparrow species (Emberizidae family). During spring and fall migration, these areas may support many migrant warbler species that use the shrubs for foraging, resting, and security cover. The yellow-rumped warbler is commonly observed in this area.

About one-half of the mammal species found in North Carolina's lower coastal plain are found on the Seashore. Species typically associated with mixed shrubs and grassland interface would include the Virginia opossums (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), rats (*Rattus* spp.), mice (*Peromyscus* spp.), meadow vole (*Microtus pennsylvanicus*), raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*). Aquatic mammals such as muskrat (*Ondatra zibethica*), mink (*Mustela* spp.), nutria (*Myocastor coypus*), and otter (*Lutra* spp.) may be observed around the ponds and marshes.

Reptiles are a significant component of the native biodiversity in virtually every natural terrestrial and freshwater habitat in the southeastern United States. They can serve important roles as both predators and prey, forming critical trophic links in many ecosystems, and can serve as indicators of environmental integrity. Up to 60 species of reptiles could possibly occur on the Outer Banks. Fifty-nine species of reptiles have been documented in Dare County; of these, 32 species of reptiles have been documented at Cape Hatteras National Seashore (NPS 2013a). Reptiles likely to occur in the project area include the black racer (*Coluber constrictor*), six-lined racerunner (*Cnemidophorus sexilineatus*), and eastern glass lizard (*Ophisaurus ventralis*).

Amphibians present at the Seashore include several species of treefrog (*Hyla* spp.), Fowler's Toad (*Bufo fowleri*), Eastern narrowmouth toad (*Gastrophryne carolinensis*), leopard frogs (*Rana* spp.), and salamanders (*Plethodon* spp.).

Many species of commercially important invertebrates and fish are supported by the food chain of the Seashore's salt marshes. The marshes and tidal creeks serve as nursery grounds for fish, clams and scallops, and crab and shrimp. Also, Essential Fish Habitat (EFH) at the Seashore is located on the soundside in areas of submerged vegetation (NPS 2010).

#### State-listed and Special Status Species

Some populations have been, or are, in decline due to either natural forces or their inability to coexist with humans. Wildlife species that are listed or recognized as special status species by the State of North Carolina but are not federally listed as endangered or threatened are addressed. Species identified as endangered, threatened, or special concern by the North Carolina Natural Heritage Program list of rare plant and animal species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

The State Endangered Species Act provides for the conservation, management, enhancement, and protection of rare animal species in North Carolina. This law makes

it unlawful to possess or disturb, for any reason not approved by the North Carolina Wildlife Resources Commission, any animal species on the protected list.

North Carolina state-listed and special status wildlife that are known to occur in Dare and Hyde counties include four species of mammals, nine species of reptiles, two species of amphibians, 20 species of birds, one species of freshwater fish, and 17 species of insects (NCNHP 2013); however, not all of these species have been documented at the Seashore (NPS 2013b). Table 3-4 lists these species, the county they are documented in, their status, their habitat, and whether they are known to occur at the Seashore. Although a survey of wildlife species at each project site has not been conducted, Table 3-5 lists the state-listed and special status wildlife potentially found at each proposed site based on habitat preference.

**Table 3-4. State-listed and special status wildlife documented in Dare and Hyde counties, North Carolina.**

Scientific Name	Common Name	County	Status*	Habitat	Documented at Seashore?
<b>Mammals</b>					
<i>Condylura cristata</i>	Star-nosed Mole –Coastal Plain Population	Dare, Hyde	SC	moist meadows, bogs, swamps, bottomlands	No
<i>Corynorhinus rafinesquii macrotis</i>	Rafinesque's Big-eared Bat – Coastal Plain subspecies	Dare	SC	roosts in hollow trees, old buildings, and beneath bridges, usually near water	No
<i>Peromyscus leucopus buxtoni</i>	Buxton Woods White-footed Mouse	Dare	SC	maritime forests	No
<i>Sorex sp. 1</i>	an undescribed shrew	Dare, Hyde	SR	early succession fields, possibly low pocosins	No
<b>Reptiles</b>					
<i>Alligator mississippiensis</i>	American Alligator	Dare, Hyde	T	fresh to slightly brackish lakes, ponds, rivers, and marshes	Yes
<i>Crotalus horridus</i>	Canebrake Rattlesnake	Dare, Hyde	SC	wetland forests in the Coastal Plain	Yes
<i>Deirochelys reticularia</i>	Chicken Turtle	Dare	SR	quiet waters of ponds, ditches, and sluggish streams	No
<i>Farancia erythrogramma</i>	Rainbow Snake	Dare, Hyde	SR	swamps, lakes, rivers, and other sluggish water	Yes
<i>Lampropeltis</i>	Outer Banks	Dare,	SC	maritime forests,	Yes

Scientific Name	Common Name	County	Status*	Habitat	Documented at Seashore?
getula sticticeps	Kingsnake	Hyde		thickets, and grasslands	
Malaclemys terrapin	Diamondback Terrapin	Dare, Hyde	SC	salt or brackish marshes, estuaries	Yes
Nerodia sipedon williamengelsi	Carolina Watersnake	Dare, Hyde	SC	salt or brackish marshes	Yes
Regina rigida	Glossy Crayfish Snake	Dare, Hyde	SR	marshes, cypress ponds, other wetlands	No
Seminatrix pygaea	Black Swamp Snake	Dare, Hyde	SR	in lush vegetation of ponds, ditches, or sluggish streams	No
Amphibians					
Ambystoma mabeei	Mabee's Salamander	Dare	SR	shallow ephemeral wetlands	No
Bufo quercicus	Oak Toad	Dare, Hyde	SR	pine flatwoods and savannas, pine sandhills where near water	No
Birds					
Botaurus lentiginosus	American Bittern	Hyde	SR	fresh or brackish marshes	Yes
Charadrius wilsonia	Wilson's Plover	Dare, Hyde	SC	beaches, island-end flats, estuarine islands	Yes
Circus cyaneus	Northern Harrier	Dare, Hyde	SR	extensive brackish marshes	Yes
Egretta caerulea	Little Blue Heron	Dare, Hyde	SC	forests or thickets on maritime islands	Yes
Egretta thula	Snowy Egret	Dare, Hyde	SC	forests or thickets on maritime islands	Yes
Egretta tricolor	Tricolored Heron	Dare, Hyde	SC	forests or thickets on maritime islands	Yes
Falco peregrinus	Peregrine Falcon	Dare, Hyde	E	coastal ponds and mudflats	Yes
Haematopus palliatus	American Oystercatcher	Dare, Hyde	SC	estuaries, oyster beds, mudflats	Yes
Haliaeetus leucocephalus	Bald Eagle	Dare, Hyde	T	mature forests near large bodies of water	Yes
Himantopus mexicanus	Black-necked Stilt	Dare	SR	fresh or brackish ponds and	Unconfirmed

Scientific Name	Common Name	County	Status*	Habitat	Documented at Seashore?
				impoundments	
<i>Hydroprogne caspia</i>	Caspian Tern	Dare, Hyde	SR	sand flats on maritime islands	No
<i>Ixobrychus exilis</i>	Least Bittern	Dare, Hyde	SC	fresh or brackish marshes	Yes
<i>Laterallus jamaicensis</i>	Black Rail	Dare, Hyde	SC	brackish marshes, rarely fresh marshes	Yes
<i>Pelecanus occidentalis</i>	Brown Pelican	Dare, Hyde	SR	maritime islands	Yes
<i>Plegadis falcinellus</i>	Glossy Ibis	Dare, Hyde	SC	forests or thickets on maritime islands	Yes
<i>Rynchops niger</i>	Black Skimmer	Dare, Hyde	SC	sand flats on maritime islands	Yes
<i>Setophaga virens waynei</i>	Black-throated Green Warbler - Coastal Plain Population	Dare, Hyde	SR	non-riverine wetland forests	No
<i>Sterna hirundo</i>	Common Tern	Dare, Hyde	SC	sand flats on maritime islands	Yes
<i>Sterna nilotica</i>	Gull-billed Tern	Dare, Hyde	T	sand flats on maritime islands	Yes
<i>Sternula antillarum</i>	Least Tern	Dare, Hyde	SC	beaches, sand flats, open dunes	Yes
Freshwater Fish					
<i>Enneacanthus obesus</i>	Banded Sunfish	Dare, Hyde	SR	most Atlantic drainages	Unknown
Insects - Butterflies					
<i>Amblyscirtes reversa</i>	Reversed Roadside-Skipper	Dare	SR	flatwoods, savannas, pocosin borders, near cane; host plant: cane	Unknown
<i>Calephelis virginensis</i>	Little Metalmark	Dare	SR	savannas and pine flatwoods; host plants: vanilla-plant, thistles	Unknown
<i>Callophrys hesseli</i>	Hessel's Hairstreak	Dare	SR	Atlantic white cedar swamps; host plant: white cedar	Unknown
<i>Euphyes berryi</i>	Berry's Skipper	Dare, Hyde	SR	wet areas near ponds, canals, or marshes; host plants: sedges	Unknown
<i>Euphyes dukesi dukesi</i>	Dukes' Skipper	Dare	SR	ecotones of brackish or fresh	Unknown

Scientific Name	Common Name	County	Status*	Habitat	Documented at Seashore?
				marshes with swamps; host plants: sedges	
Neonympha helicta	Helicta Satyr	Dare, Hyde	SR	sedgy wetlands, including sandhill seeps, pocosin ecotones, low pocosins in the northeast Coastal Plain; host plants: sedges	Unknown
Papilio cresphontes	Giant Swallowtail	Dare, Hyde	SR	primarily coastal in maritime forests or thickets; host plants: prickly-ash, hoptree	Unknown
Poanes aaroni aaroni	Aaron's Skipper	Dare, Hyde	SR	brackish marshes along northern coast and sounds; host plants: grasses	Unknown
Satyrium favonius ontario	Northern Oak Hairstreak	Dare, Hyde	SR	oak-dominated woods, usually in dry sites; host plants: oaks	Unknown
Insects – Macro-moths					
Anacamptodes cypressaria	an inchworm moth	Dare	SR	cypress swamps	Unknown
Catocala messalina	Messalina Underwing	Dare	SR	maritime forests and xeric sandhills	Unknown
Hemipachnobia monochromatea	Sundew Cutworm Moth	Dare	SR	cranberry bogs and northern low pocosins	Unknown
Hypagyrtis brendae	Brenda's Hypagyrtis	Dare	SR	Atlantic white cedar forests	Unknown
Lascopia roblei	a canebrake moth	Dare	SR	woodland canebrakes	Unknown
Zale declarans	an owlet moth	Dare	SR	maritime forests with live oak	Unknown
Insects – Beetles					
Cicindela lepida	Ghost Tiger Beetle	Dare	SR	sand dunes along northern coast	Unknown
Insects – True Bugs					
Chlorochroa dismalia	Dismal Swamp Green Stink Bug	Hyde	SR	canebrakes	Unknown

\* E=Endangered, T=Threatened, SC=Special Concern, SR=Significantly Rare

Sources: NCNHP 2013; NPS 2013b

**Table 3-5. Wildlife and Wildlife Habitat at Each Proposed Facility**

Site no.	Facility	Affected Wildlife and Wildlife Habitat
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Habitat: maritime shrub, dune grass; Potential state-listed wildlife: <i>Sternula antillarum</i> , <i>Cicindela lepida</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i>
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
3	Additional access road from NC 12 to fee station at Coquina Beach	Habitat: maritime shrub, vegetated parking area margins and island; Potential state-listed wildlife: <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i>
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Habitat: maritime shrub, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Cicindela lepida</i>
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Cicindela lepida</i>
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Cicindela lepida</i>
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Cicindela lepida</i>
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Cicindela lepida</i>
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Cicindela lepida</i>
11	A handicap accessible boardwalk at Ramp 34	Habitat: maritime shrub, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife:

Site no.	Facility	Affected Wildlife and Wildlife Habitat
		Charadrius wilsonia, Sternula antillarum, Egretta caerulea, Egretta thula, Egretta tricolor, Plegadis falcinellus, Sorex sp. 1, Cicindela lepida
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Habitat: dune grass; Potential state-listed wildlife: <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
13	A 15-car parking area west side of highway at/near Kite Point	Habitat: dune grass; Potential state-listed wildlife: <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Habitat: dune grass; Potential state-listed wildlife: <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
15	A 5-car parking area west side of highway at/near soundside access 60	Habitat: dune grass, salt shrub; Potential state-listed wildlife: <i>Sternula antillarum</i> , <i>Cicindela lepida</i> , <i>Botaurus lentiginosus</i> , <i>Circus cyaneus</i> , <i>Ixobrychus exilis</i> , <i>Laterallus jamaicensis</i>
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
17	A handicap accessible boardwalk at Lighthouse Beach	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Habitat: maritime shrub, maritime wet grassland, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Lampropeltis getula sticticeps</i> , <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Condylura cristata</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex sp. 1</i> , <i>Cicindela lepida</i>
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Habitat: wet grassland, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Lampropeltis getula sticticeps</i> , <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Sorex sp. 1</i> , <i>Cicindela lepida</i>
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Habitat: maritime shrub, maritime wet grassland, maritime dry grassland, dune grass, upper beach; Potential state-listed wildlife: <i>Lampropeltis getula sticticeps</i> , <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Condylura cristata</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex sp. 1</i> , <i>Cicindela lepida</i>
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Habitat: maritime shrub, maritime evergreen forest, maritime dry grassland, dune grass; Potential state-listed wildlife: <i>Lampropeltis getula sticticeps</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Haliaeetus leucocephalus</i> , <i>Plegadis falcinellus</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i> ,

Site no.	Facility	Affected Wildlife and Wildlife Habitat
		<i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Sorex</i> sp. 1, <i>Catocala messalina</i> , <i>Zale declarans</i>
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Habitat: maritime dry grassland; Potential state-listed wildlife: <i>Sorex</i> sp. 1, <i>Lampropeltis getula sticticeps</i>
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Habitat: dune grass, upper beach, and vegetated parking area margins; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Cicindela lepida</i>
25	An ORV Ramp 59.5 at north Ocracoke	Habitat: maritime shrub, dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Egretta caerulea</i> , <i>Egretta thula</i> , <i>Egretta tricolor</i> , <i>Plegadis falcinellus</i> , <i>Cicindela lepida</i>
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Habitat: maritime dry grassland; Potential state-listed wildlife: <i>Sorex</i> sp. 1, <i>Lampropeltis getula sticticeps</i>
27	An ORV Ramp 63 across from Scrag Cedar Road	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Habitat: dune grass, upper beach; Potential state-listed wildlife: <i>Charadrius wilsonia</i> , <i>Sternula antillarum</i> , <i>Cicindela lepida</i>

Sources: Krings 2012; NCNHP 2013; NPS 2013b

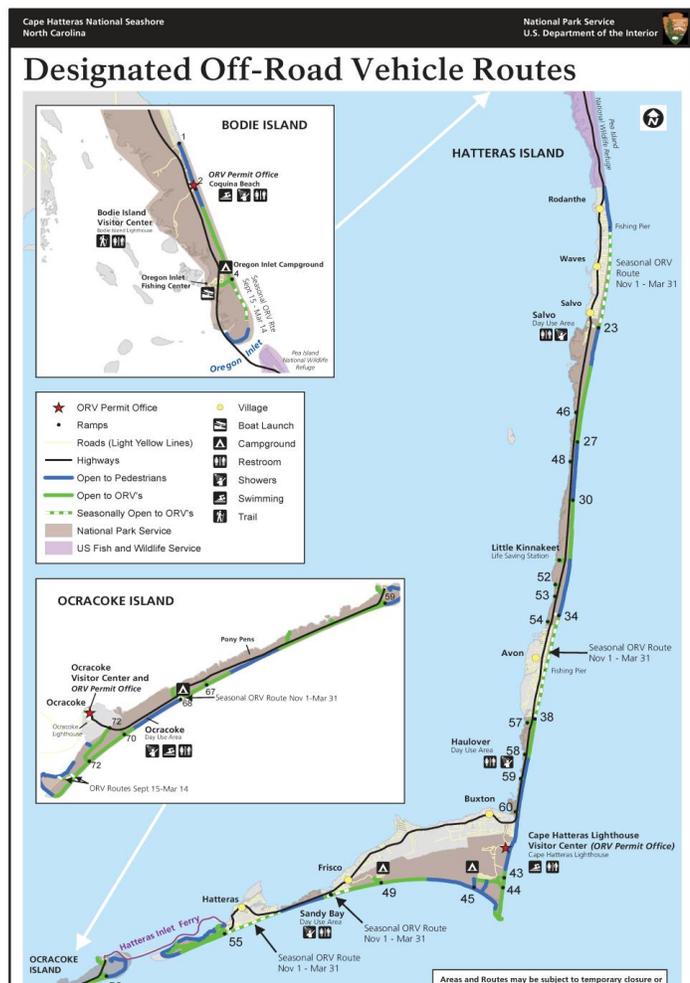
## VISITOR USE AND EXPERIENCE

The Cape Hatteras National Seashore is managed according to NPS Management Policies which state that the park resources and values are to be enjoyed presently and in the future by the people of the United States, and that NPS is committed to providing appropriate high-quality opportunities for all visitors (NPS 2006). As such there are a number of visitor use opportunities at the Cape Hatteras National Seashore.

Recreational activities include shelling, birding, kayaking, canoeing, windsurfing, camping, fishing, hunting, swimming, auto touring, biking, hiking, horseback riding, stargazing, surfing, kite boarding, and wildlife viewing. Access to these recreational activities is primarily done by driving on North Carolina State Highway 12 (NC-12) and parking at a designated lots along the road or along unmarked pull off areas; or by using an off road vehicle (ORV) to drive along the beach or sound to the designated recreation spot. ORV access to the beach is via designated ramps going from NC-12 to the beach. Historically much of the ocean shore was open to ORV access but in accordance to the guidelines in the 2010 Off-Road Vehicle Management Plan (ORVMP)/Environmental Impact Statement areas of the seashore are now either closed part of the year or all of the year to ORVs. See Figure 3-1 for a map of the areas open or closed to ORV driving.

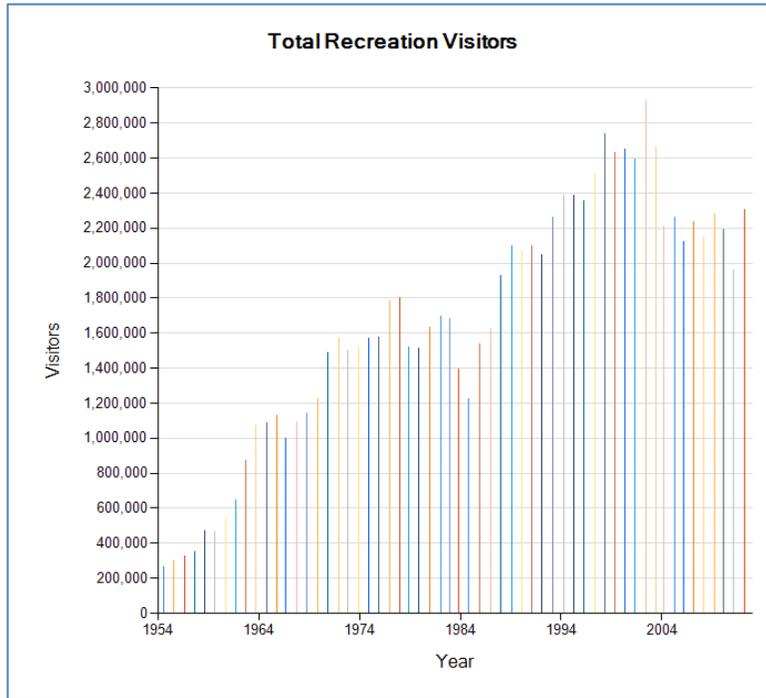
Depending on the perspective of the visitor, a beach closed to ORVs can be a pleasant experience, or an inconvenience. Visitors who value the solitude and natural surroundings of the beach may enjoy the pedestrian only beach areas. While for visitors who need the vehicles to assist in the hauling of their recreation gear, or that have difficulty walking along the sand to the beach, the beach closures prevent them from accessing parts of the beach for recreation.

Visitor totals per year over the last 10 years to Cape Hatteras National Seashore have ranged from 1.9 million to 2.3 million; with the lowest count occurring in 2011 and the highest in 2012. See Figure 3-2. In 2011, Hurricane Irene occurred the weekend prior to Labor Day weekend and shut



**Figure 3-1. Designated Off-Road Vehicle Routes (NPS, 2012c)**

down access to Hatteras Island for 6 weeks. Visits are highest in the months of June, July, and August with over 300,000 visitors in each of those months in 2012 (NPS, 2013). Table 3-6 describes the specific affected Visitor Use and Experience for each of the proposed 29 facility sites.



**Figure 3-2**

**National Seashore Visitor Totals (NPS, 2012a)**

**Cape Hatteras**

**Table 3-6 Visitor Use Characteristics of the 29 Development Locations**

Site no.	Facility	Affected Visitor Use and Experience
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Currently visitors are using this area as a parking area to access the beach for the aforementioned recreation activities. Beach at this location is restricted to pedestrian access.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	A large parking area allows beach goers to park and access the beach for aforementioned recreation activities here via sand trails or a boardwalk that does not extend all the way to the beach. Restrooms and shower facilities are at this location, along with the ORV permit office. An ORV ramp is at this location, but the beach is restricted to pedestrian access.
3	Additional access road from NC 12 to fee station at Coquina Beach	A large parking area allows beach goers to park and access the beach for aforementioned recreation activities here via sand trails or a boardwalk that does not extend all the way to the beach. Restrooms and shower facilities are at this location, along with the ORV permit office. An ORV ramp is at this location, but the beach is restricted to pedestrian access.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Beach is only readily accessed for aforementioned recreation activities at this location by ORV via Ramp 4, 1.5 miles south of this location. Pedestrian access to this location would be only by a 1 mile walk from the Oregon Inlet campground. Beach is open to the ORV south of this location and closed north of this location.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Beach at this location is accessed via Ramp 4 and sand foot trails from the Oregon Inlet Campground directly north of this site. Beach north of this location is open to ORVs, and south of this location is seasonally closed to ORVs.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	A parking area along NC-12 at this site allow pedestrian access via Ramp 23 for aforementioned recreation activities. Ramp 23 also allows ORV access to the seasonally open area north of the ramp. The area south of the Ramp is closed to ORVs.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	There is no pedestrian or ORV access to this area of the beach to facilitate recreation activities. This area is closed to ORVs.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	No beach access at this location to facilitate aforementioned recreation activities. Beach is closed to ORVs north of here, and open to ORVs to the south. ORVs can access the beach from Ramp 27 to the south, but pedestrians are excluded without a 1.5 walk.
9	A 5-car parking area and foot trail to beach (beachside) at soundside	No beach access at this location to facilitate aforementioned recreation activities. Beach is closed to ORVs at this location. Pedestrian access is only via a ¾

Site no.	Facility	Affected Visitor Use and Experience
	Ramp 48	mile walk from Ramp 27.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	No beach access at this location to facilitate aforementioned recreation activities. Beach is open to ORVs north of here and closed to ORVs south of here. ORV access to this location would be from Ramp 30, 2.5 miles north.
11	A handicap accessible boardwalk at Ramp 34	Existing parking area and ORV ramp at this location to facilitate aforementioned recreation activities. Pedestrian access is by a sand trail. North of this location is closed to ORVs, and south of this location is closed seasonally to ORVs. South of this location is the town of Avon where most private residences have trail access to the beach.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Haulover beach has a large parking area, and numerous sand pedestrian trails to both the ocean beach and sound beach to facilitate aforementioned recreation activities. Facilities at this location include restrooms and showers. This soundside location is a popular spot for kite-surfing and windsurfing.
13	A 15-car parking area west side of highway at/near Kite Point	Soundside access occurs by parking on NC-12. Popular soundside spot for kitesurfing and windsurfing. No ocean beach access. Ocean beach is closed to ORVs at this location. Pedestrian access to the ocean beach at this location would be from a sand trail ¼ mile south.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Beach pedestrian access via sand trail to facilitate aforementioned recreation activities. Parking is occurring along NC-12 here. Beach is closed to ORVs.
15	A 5-car parking area west side of highway at/near soundside access 60	Soundside access at this location is via Ramp 60. Parking occurs along NC-12. Ocean beach access is via a sand trail. The ocean beach at this location is closed to ORVs.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Beach at this location is accessed via parking at one of the Cape Hatteras Lighthouse parking areas and walking north a ¼ mile. Beach at this location is closed to ORVs.
17	A handicap accessible boardwalk at Lighthouse Beach	A large parking area is at this location to facilitate aforementioned recreation activities, and the beach is accessed via walking over the open sand. This is a very popular beach area. Restrooms are located at the nearby Cape Hatteras Light House Visitor Center, as well as an ORV permit office.
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Parking occurs here along an unmarked pull-off area, and beach is access via a ¼ mile walk down an unused road, and a sand path. Beach is closed to ORVs north of this location, and open to ORVs south of this location.
19	An elevated section of	Lighthouse Road leads to Ramp 43 which facilitates ORV

Site no.	Facility	Affected Visitor Use and Experience
	Lighthouse Road to address flooding at ramps 43 and 44	access for aforementioned recreation activities on the ORV-open beach at this location. This section of road floods frequently which can block ORV access.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Pedestrian access to the beach only in the area between Ramp 45 and the newly proposed Ramp 48. Currently there is no easy way for pedestrians to access the beach except from the Ramp 45 parking area to the east, and the ORV open area west of Ramp 48. At each end of this proposed Interdunal road are campgrounds; Cape Point on the east end and Frisco Campground East on the West end of the proposed road. Pedestrian access to the beach on the end open to ORVs is via sand trails from the Frisco Campground.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Beach access to this area for ORVs is via Ramp 49. The beach is open to ORVs at this location. Pedestrian access to the beach is via a boardwalk. This is a very popular spot for beach recreating.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	A large parking area at Ramp 55 provides both pedestrian access via a boardwalk and sand trail, and ORV access via Ramp 55. Northeast of Ramp 55 is closed seasonally to ORVs, and southwest of Ramp 55 is open to ORVs. The Graveyard of the Atlantic Museum is nearby this location, and the area is very popular for the aforementioned recreation activities.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	The beach at this location is closed to ORVs. Access for pedestrians is via the beach open to ORVs ½ northeast of this location.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	This location is at the Ferry Terminal which is the main transport means for visitors come to or leaving Ocracoke Island. The ferry is heavily used in the summer months so there are often crowds waiting at the ferry terminal.
25	An ORV Ramp 59.5 at north Ocracoke	Pedestrian beach access from this location is via a parking area just north of the proposed ramp. The area north of here is closed to ORVs, and the area south of here is open to ORVs. Currently Ramp 59 is allowing access to the beach for ORVs but this ramp is to be closed in the future.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Parking to access the beach for aforementioned recreation activities currently occurs along NC-12. The beach is open to ORVs at this location.
27	An ORV Ramp 63 across from Scrag Cedar Road	Currently beach is open to ORV use here but only place to access it is from Ramp 59, as ORV closure starts southwest of this location. No parking at this location and pedestrian access is minimal.

Site no.	Facility	Affected Visitor Use and Experience
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Pedestrian only beach access for aforementioned recreation activities. A parking area is located at this spot with a boardwalk that goes almost all the way to the beach. The Ocracoke pony pens are located across NC-12 from this beach access location.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Pedestrian only beach access for aforementioned recreation activities. A parking area is located at this spot with a boardwalk that goes almost all the way to the beach. Restroom and shower facilities are at this location. A popular stop for beach recreating.

## HUMAN HEALTH AND SAFETY

Human health and safety addresses the safety and health of construction crew as well as the safety of the visitors of the Seashore. Under current management, village beaches are closed to off road vehicles (ORVs) to protect pedestrians during the busy summer season. In early 2009, Seashore law enforcement staff indicated that in the prior 10 years, there were no known case incident reports documenting pedestrians being struck by ORVs on Seashore beaches (NPS 2010).

The Americans with Disabilities Act (ADA) prohibits discrimination on the basis of disability in employment, State and local government, public accommodations, commercial facilities, transportation, and telecommunications. Public accommodations must comply with basic nondiscrimination requirements that prohibit exclusion, segregation, and unequal treatment. The ADA Accessibility Guidelines (ADAAG) states that ground and floor surfaces along accessible routes and in accessible spaces shall be stable, firm, and slip-resistant. It also states that Changes in level up to 1/4 in (6 mm) may be vertical and without edge treatment. Changes in level between 1/4 in and 1/2 in (6 mm and 13 mm) shall be beveled with a slope no greater than 1:2. Changes in level greater than 1/2 in (13 mm) shall be accomplished by means of a ramp (ADA 2002).

The Occupational Safety and Health Administration (OSHA) issues standards for crew that specify the amount and type of safety training and education required for industrial crew, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910).

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences associated with implementing both the no action alternative (Alternative A), and the action alternative (Alternative B, or the preferred Alternative). As required by NEPA, it includes the context, intensity, and duration of direct, indirect, and cumulative impacts. Each section describes the methodology use to analyze the impact level to each resource.

### ***Assessment of Cumulative Effects***

According to CEQ implementing regulations for NEPA at 40 CFR 1508.7, "Cumulative impact" is 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Past, present and reasonably foreseeable future actions at Cape Hatteras National Seashore that were considered in evaluating the potential cumulative impacts of the proposed ORV improvement projects are listed here. The park issues about 200 special use permit annually for all types of one-time events. These events would fall into the present actions and future actions categories. Hurricanes and other storms and weather events can and have significantly affected Cape Hatteras and would be expected to occur according to seasonal patterns into the future. Because these weather events are not the actions of any public or private entity and because their effects are impossible to predict, they are not listed here. Storm recovery efforts that have occurred or that are underway are part of the set of actions considered. The following past, present, and future actions were considered:

#### Past Actions

- Hurricane and Other Storm Recovery
- Berm Construction by Civilian Conservation Corps and berm maintenance
- USFWS: species recovery plans
- USFWS: Pea Island National Wildlife Refuge Comprehensive Conservation Plan
- NPS: Resource Management Plan
- NPS: 2007 Cape Hatteras National Seashore Long-Range Interpretive Plan
- NPS: Cape Hatteras National Seashore General Management Plan
- NPS: Previous attempts to complete ORV plans
- NPS: Concession permits/operations
- NPS and USDA-APHIS: Predator Control Program for Protected Species Management
- NPS: Species management at Cape Lookout National Seashore
- Species research efforts
- NPS: Multi-use trail on Ocracoke Island
- NPS: Relocation of Bodie Island U.S. Coast Guard Station Complex
- NPS: NC-12 Improvements

- U.S. Coast Guard: Construction of a Remote Fixed Facility (RFF) Buxton, Dare County, N.C.
- U.S. Coast Guard: Removing Facilities at the Former Buxton Coast Guard Station
- N.C. Department of Transportation: Herbert C. Bonner Bridge Repair Work
- N.C. Department of Transportation: NC-12 Recovery Efforts- NC-12 Sandbag and Dune Rebuilding
- Dare and Hyde Counties: County Land Use Development Plan for Dare and Hyde counties
- Commercial Fishing
- Dare County: Designation of Outer Banks Scenic Byway
- Outer Banks Scenic Byway Committee: Multi-Use Path(s) paved pathways on Hatteras Island

#### Present Actions

- Hurricane and Other Storm Recovery
- Berm maintenance
- USFWS: species recovery plans
- USFWS: Pea Island National Wildlife Refuge Comprehensive Conservation Plan
- NPS: Resource Management Plan
- NPS: 2007 Cape Hatteras National Seashore Long-Range Interpretive Plan
- NPS: Cape Hatteras National Seashore General Management Plan
- NPS: Concession permits/operations
- Increased vehicle traffic and village events
- NPS and local government: Ongoing law enforcement
- NPS: Predator Control Program for Protected Species Management
- Species research efforts
- NPS: Ongoing resource surveying
- U.S. Army Corps of Engineers: Dredging Walter Slough
- N.C. Department of Transportation: Herbert C. Bonner Bridge Repair Work
- N.C. Department of Transportation: Herbert C. Bonner Replacement Project
- N.C. Department of Transportation: Long-term Solutions for NC-12 Breaches, Phase II of Herbert C. Bonner Bridge Replacement Project
- N.C. Department of Transportation: NC-12 Improvement Projects South of Rodanthe
- Dare and Hyde Counties: County Land Use Development Plan for Dare and Hyde counties
- Town of Nags Head: Stormwater management / flood control
- Commercial Fishing
- NPS: Silver Lake Docks at Ocracoke

#### Future Actions

- Hurricane and Other Storm Recovery
- Berm maintenance

- USFWS: species recovery plans
- USFWS: Pea Island National Wildlife Refuge Comprehensive Conservation Plan
- NPS: Resource Management Plan
- NPS: 2007 Cape Hatteras National Seashore Long-Range Interpretive Plan
- NPS: Concession permits/operations
- NPS: Predator Control Program for Protected Species Management
- NPS: Species management at Cape Lookout National Seashore
- Species research efforts
- Increased vehicle traffic and village events
- NPS and local government: Ongoing law enforcement
- NPS: Ongoing Seashore Maintenance Projects
- NPS: Update of the 1984 Cape Hatteras National Seashore General Management Plan
- Development of Cape Lookout National Seashore ORV Management Plan/EIS
- Cape Hatteras Electric Cooperative: Pole Improvement Project (Beach Nourishment or Moving Poles Closer to NC-12). Description: The Cape Hatteras Electric Cooperative would replace damaged and old poles along NC-12
- NPS: Repairing Oregon Inlet Public Boat Ramps
- NPS: Removing or Rebuilding the Frisco Pier
- NPS and Dare County: Building of a bulkhead around the Salvo Cemetery to protect it from storm damage
- NPS: Permanent Offices for the ORV permits
- USFWS & SHPO: Removal of “The Sand Castle” at North end of Coquina Beach
- NPS: Placing Water Line from NC-12 to Frisco Campground
- Wildlife Resources Commission: Public Boating Access Area at Hatteras
- DOD: Potential for military training operations, overflights
- U.S. Coast Guard: Building Fee Kiosks at the Ocracoke Ferry
- U.S. Coast Guard: Hatteras Island Coast Guard Station
- U.S. Coast Guard: Expanding Boat Ramp at Hatteras Inlet
- U.S. Army Corps of Engineers/Dare County: Dredging and Repairing Bulkheads at Oregon Inlet Fishing Center
- N.C. Department of Transportation: NC-12 Improvements
- Dare and Hyde Counties: County Land Use Development Plan for Dare and Hyde counties
- Commercial Fishing
- Hatteras Island Ocean Center, Inc.: Hatteras Island Ocean Center and Pier
- Avon Pier Safety Concerns
- New Proposed Water Line from Avon to Little Kinnakeet Historical District (If Historical District Goes Through)
- Putting jetties in at Oregon Inlet

- NPS: Prescribed Burn on 2,061 acres within Cape Hatteras National Seashore
- Bonner Bridge wetland mitigation

A complete description of the project included in the cumulative impacts is provided in Appendix C.

## **GEOLOGY, TOPOGRAPHY, AND SOILS**

### **Methodology and Assumptions**

The intensity of the potential effects on Geology, Topography, and Soils was evaluated using the following system of impact thresholds:

**Negligible:** Effects on geology, topography, and soils in terms of dune conditions, and sand distribution would not be measurable or of perceptible consequence to geology, topography, and soils.

**Minor:** Effects on geology, topography, and soils in terms of dune conditions, and sand distribution would be altered such that changes would be detectable. Any changes would be of little consequence.

**Moderate:** Effects on geology, topography, and soils in terms of dune conditions, and sand distribution would be altered such that changes would be readily apparent and measurable.

**Major:** Effects on geology, topography, and soils in terms of dune conditions, and sand distribution would be altered such that changes would be readily apparent, and would substantially change the characteristics of the primary dune.

**Impact duration** is described as either short- or long-term. Short-term impacts would be recognized and measurable for less than one year. Long-term impacts would be recognized and measurable for more than one year.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands.

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, the No Action Alternative, the proposed ramps, boardwalks, parking areas, access roads, and interdunal road would not be constructed. Geology, topography, and soil resources would continue to persist as described. There would be not impact on geology, topography, and soils from Alternative A.

### ***Cumulative Impacts***

Past, present, and planned future activities also have the potential to impact visitor use and experience at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Erosion and overwash of sand are natural processes that occur with daily wave action and passing storms. Past, present and future actions within the Seashore may have short-term minor to moderate adverse impacts. In the past, the construction of sand fences to built up dune sand, and the planting of stabilization vegetation on the dunes occurred in the 1930's. These actions resulted in the artificial blockage of sand and the movement of the dune field across the island. Narrowing of the beaches occurred, and created long-term adverse effects to the geology, topography, and soils of the Cape Hatteras National Seashore. Compared to dune stabilization, the effects of pavement and building for park facilities in the past have been minor. Currently and in the future, the park intends to not impede any major processes in regards to geology and topography of the barrier islands. However, combined with the past events, the overall impacts to geology, soils, and topography is long-term moderate adverse.

### ***Conclusion***

The impacts of Alternative A would not change the geology, soils, or topography of the Cape Hatteras National Seashore and they would not contribute to the moderate adverse impacts of the past dune stabilization program.

### **Impacts of Alternative B, the NPS Preferred Alternative**

Alternative B, the preferred alternative, would include 29 proposed public access facilities. Facilities would include unpaved ORV ramps, parking areas, handicap accessible boardwalks, foot trails, road improvements, and an unpaved interdunal road. The goal of these projects is to enhance pedestrian access in areas closed to ORVs, and ensure ORV access to the areas that are open to ORVs. Overall, adverse impacts from facilities constructed within Cape Hatteras National Seashore would include those that destroy dunes, or block the movement of sand. In the case of these projects, the ORV ramps would have the greatest impacts because of the potential need to reshape the dunes. Dunes would need to be reshaped when there is a greater than 5% grade for the ramps to go up and over the dune. For each project, an estimation of when this may happen is given but due to the dynamic nature of the area the height of dunes can change frequently. Overall, most of the other projects would have minor impacts because they have small footprints and don't require grading of the topography, or much removal of stabilization vegetation.

Table 4-1 gives the description of impacts by proposed project location for ease of reading. Location of the project sites with regards to the location of the primary dunes was determined by USGS coastal topography data (2009) and State of North Carolina aerial orthoimagery (2010). The data used to analyze the impacts are the best available but as this is a very dynamic environment that is changed frequently with passing storms, on the ground conditions at present may vary.

**Table 4-1. Impacts to Geology, Topography, and Soils at Each Proposed Facility**

Site no.	Facility	Impacts to Geology, Topography, and Soils
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	The proposed parking area is behind the primary dune, and would not impact dune building or erosion. Topography in the location has already been impacted from the former U.S. Coast Guard Station. Sand would be disturbed but this is common in this dynamic environment. Impacts would be long-term negligible.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	The new boardwalk platform is within the primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk may disturb 0.3 acres of dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts would be short-term minor adverse.
3	Additional access road from NC 12 to fee station at Coquina Beach	The access road would be built behind the primary dune, and would not impact dune building or erosion. The access road would be adjacent to an existing paved parking area would not change the topography of the land, or impact soil movement. Impacts would be long-term negligible.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	The proposed ORV ramp would go up and over the primary dune at this location. The dune height is approximately 20 feet here, and to ensure a less than 5% grade, reshaping would need to be done at the ramp. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and reshaping of the dune would make susceptible to becoming a conduit for overwash during events where overwash wouldn't be able to top the adjacent vegetated dunes. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term moderate adverse. The 10-car parking area is within the dune field but behind the primary dune. Topography in this area is variable, and the area would need to be graded. Impacts from the construction of the parking area would be long-term minor adverse.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	The proposed parking area is behind the primary dune, and would not impact dune building or erosion. Topography in the location has already been impacted from existing ORV Ramp 4. Sand would be disturbed but this is common in this dynamic environment. Impacts from the parking area would be long-term negligible. The proposed foot trail would not involve construction, just signs designated the path. Trampling of plants may occur in the narrow path area that may lead to increased erosion of the dune at the crest where the trail meets the beach. Impacts from the foot trail would be long-term minor adverse.

Site no.	Facility	Impacts to Geology, Topography, and Soils
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	The proposed parking area is behind the primary dune, and would not impact dune building or erosion. Topography in this area is variable, and the area would need to be graded. Impacts from the construction of the parking area would be long-term minor adverse. The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk and parking area may disturb up to 0.61 acres of dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts would be short-term minor adverse.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Proposed parking area is behind the primary dune, adjacent to the disturbed area of US-12 and construction would not change much topography. Impacts from the proposed parking area would be long-term negligible. The proposed foot trail would not involve construction aside from inserting signs designating the path. Trampling of plants may occur in the narrow path area that may lead to increased erosion of the dune at the crest where the trail meets the beach. Impacts would be long-term minor adverse.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	The proposed ORV ramp would go up and over the primary dune at this location. The dune height is approximately 20 feet here, and to ensure a less than 5% grade, reshaping would need to be done at the ramp. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and reshaping of the dune would make susceptible to becoming a conduit for overwash during events where overwash wouldn't be able to top the adjacent vegetated dunes. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term moderate adverse. Proposed parking area is behind the primary dune, adjacent to the disturbed area of US-12 and construction would not change much topography. Impacts from the proposed parking area would be negligible. The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand

Site no.	Facility	Impacts to Geology, Topography, and Soils
		is free underneath the platform. The construction of the boardwalk may disturb dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts from the proposed boardwalk would be short-term minor adverse.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	The proposed parking area is behind the primary dune, adjacent to the disturbed area of US-12 and construction would not change much topography. Impacts from the proposed parking area would be negligible. The proposed foot trail would not involve construction aside from inserting signs designating the path. Trampling of plants may occur in the narrow path area that may lead to increased erosion of the dune at the crest where the trail meets the beach. Impacts would be long-term minor adverse.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	The proposed ORV ramp would go up and over the primary dune at this location. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and vegetation removal may make it more susceptible to erosion, especially at the dune crest where the ramp meets the beach. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term moderate adverse. Proposed parking area is behind the primary dune, adjacent to the disturbed area of US-12 and construction would not change much topography. Impacts from the proposed parking area would be negligible. The proposed foot trail would not involve construction, just signs designated the path. Trampling of plants may occur in the narrow path area that may lead to increased erosion of the dune at the crest where the trail meets the beach. Impacts from the foot trail would be long-term minor adverse.
11	A handicap accessible boardwalk at Ramp 34	The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk may disturb dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts from the proposed boardwalk would be short-term minor adverse.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	The proposed boardwalk is on the backside of Hatteras Island, and is adjacent to the sound. The construction of the boardwalk may disturb vegetation and destabilize the sand. However, the area is already disturbed because of its popularity. Impacts would be short-term negligible.
13	A 15-car parking area west side of highway at/near Kite Point	The proposed parking area is behind the primary dune and on the backside of Hatteras Island adjacent to the sound. Topography in the location has already been impacted from visitors parking along NC-12. Sand would be disturbed but this is common in this dynamic environment. Impacts would be negligible.

Site no.	Facility	Impacts to Geology, Topography, and Soils
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	The proposed parking area is behind the primary dune and on the backside of Hatteras Island adjacent to the sound. Topography in the location has already been impacted from soundside access ramp 59 and NC-12. Sand would be disturbed but this is common in this dynamic environment. Impacts would be negligible.
15	A 5-car parking area west side of highway at/near soundside access 60	The proposed parking area is behind the primary dune and on the backside of Hatteras Island adjacent to wetlands. Topography in the location has already been impacted from NC-12. Sand would be disturbed but this is common in this dynamic environment. Impacts would be negligible.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. Impacts from the proposed boardwalk would be negligible.
17	A handicap accessible boardwalk at Lighthouse Beach	The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. Impacts from the proposed boardwalk would be negligible.
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	The proposed parking area is behind the primary dune, and would not impact dune building or erosion. Topography in this area has already been impacted by Loran road and current parking and the area would need to be graded. Impacts from the construction of the parking area would be negligible. Handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk and parking area may disturb dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts would be short-term minor adverse.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	The section of Lighthouse Road traverses back barrier marsh area to beach. Because this project requires no new building and only the raising of an existing structure the impacts are long-term negligible.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp	The proposed unpaved interdunal road would travel in the dune field behind the primary dune line. It won't be paved but it would be cleared of vegetation, and compacted by ORV users. Removal of binding vegetation and compaction may lead to increased erosion.

Site no.	Facility	Impacts to Geology, Topography, and Soils
	48 to the beach	Impacts would be long-term minor adverse. The proposed ORV ramp would go up and over the primary dune at this location. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and vegetation removal may make it more susceptible to erosion, especially at the dune crest where the ramp meets the beach. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term minor adverse.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	The proposed road widening, connector road, and parking area are behind the primary dune and would not impact dune building or erosion. The area is already disturbed from Ramp 49, and topography would not change. Impacts would be long-term negligible.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk and parking area may disturb dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts would be short-term minor adverse.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	The proposed parking area would not be paved, just marked as a parking area. It is on the north side of Hatteras Inlet, it an area where the beach is accreting and has short primary dunes. As such this area is susceptible to overwash. The parking area should not impede the overwash process. Impacts would be long-term negligible.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	The handicap accessible boardwalk would traverse the dune field and primary dune, but since it would be elevated the movement of sand is free underneath the platform. The construction of the boardwalk and parking area may disturb dune vegetation which could create temporary instability for the dune and lead to increased erosion. Impacts would be short-term minor adverse.
25	An ORV Ramp 59.5 at north Ocracoke	The proposed ORV ramp would go up and over the primary dune at this location. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and vegetation removal may make it more susceptible to erosion, especially at the dune crest where the ramp meets the beach. Compaction and reshaping of the dune would make susceptible to becoming a conduit for overwash during events where overwash

Site no.	Facility	Impacts to Geology, Topography, and Soils
		wouldn't be able to top the adjacent vegetated dunes. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term moderate adverse.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	The proposed parking area is behind the primary dune and on the backside of Hatteras Island adjacent to the vegetated flats. Topography in the location has already been impacted from NC-12. Sand would be disturbed but this is common in this dynamic environment. Impacts would be long-term negligible.
27	An ORV Ramp 63 across from Scrag Cedar Road	The proposed ORV ramp would go up and over the primary dune at this location. Vegetation would be removed during construction, and a mixture of sand, shell, and clay would be applied. During use of the ramp, the mixture would become compacted. Compaction and vegetation removal may make it more susceptible to erosion, especially at the dune crest where the ramp meets the beach. Compaction and reshaping of the dune would make susceptible to becoming a conduit for overwash during events where overwash wouldn't be able to top the adjacent vegetated dunes. The dunes have been impacted by human activities so impacts are not as adverse as if they were naturally occurring dunes. Impacts from the proposed ramp would be long-term moderate adverse.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	The handicap accessible boardwalk platform would be constructed over the primary dune, but since it would be elevated the movement of sand is free underneath the platform. Impacts would be long-term negligible.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	The handicap accessible boardwalk would be constructed over the primary dune, but since it would be elevated the movement of sand is free underneath the platform. Impacts would be long-term negligible.

### ***Cumulative Impacts***

Past, present, and planned future activities also have the potential to impact visitor use and experience at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Erosion and overwash of sand are natural processes that occur with daily wave action and passing storms. Past, present and future actions within the Seashore may have short-term minor to moderate adverse impacts. In the past, the construction of sand fences to build up dune sand, and the planting of stabilization vegetation on the dunes occurred in the 1930's. These actions resulted in the artificial blockage of sand and the movement of the dune field across the island. Narrowing of the beaches occurred, and created long-term adverse effects to the geology, topography, and soils

of the Cape Hatteras National Seashore. Compared to dune stabilization, the effects of pavement and building for park facilities in the past have been minor. Currently and in the future, the park intends to not impede any major processes in regards to geology and topography of the barrier islands. However, combined with the past events, the overall impacts to geology, soils, and topography is long-term moderate adverse.

***Conclusion***

Under Alternative B, short-term minor and long-term negligible, minor, and moderate adverse impacts would occur. The contribution of the Alternative B impacts to the cumulative impacts from past, present, and future impacts would remain long-term moderate adverse.

## **WATER QUALITY/MARINE AND ESTUARINE RESOURCES**

### **Methodology and Assumptions**

The intensity of the potential effects on Water Quality/Marine and Estuarine Resources was evaluated using the following system of impact thresholds:

**Negligible:** Effects on water quality in terms of marine and estuarine resources would not be measurable or of perceptible consequence to marine and estuarine resources and not in violation of Coastal Management Program regulations.

**Minor:** Effects on water quality in terms of marine and estuarine resources would be altered such that changes would be detectable. Any changes would be of little consequence and not in violation of Coastal Management Program regulations.

**Moderate:** Effects on water quality in terms of marine and estuarine resources would be altered such that changes would be readily apparent and measurable, and in violation of Coastal Management Program regulations.

**Major:** Effects on water quality in terms of marine and estuarine resources would be altered such that changes would be readily apparent, and would substantially change the characteristics of the primary dune.

**Impact duration** is described as either short or long-term. Short-term impacts would be recognized and measurable for less than six months. Long-term impacts would be recognized and measurable for more than six months.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, the No Action Alternative, the proposed ramps, boardwalks, parking areas, access roads, and interdunal road would not be constructed. Water quality and marine and estuarine resources would continue to persist as described. There would not be any further impacts on water quality, and marine and estuarine resources from Alternative A.

#### ***Cumulative Impacts***

Past, present, and planned future activities also have the potential to impact water quality, and marine and estuarine resources at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Past, present, and future actions within the Seashore may have short-term minor to major adverse impacts. In the past, the development of impervious surfaces in the way of roads, ferry landings, and other development on and

around the Cape Hatteras National Seashore has concentrated pollutants and increased stormwater runoff. These projects include the building and continued maintenance of NC-17; the building and continued maintenance of the Herbert C. Bonner Bridge; and the construction of Coast Guard, and National Park Service facilities. Impacts to estuarine resource as have occurred as a result of sediment disturbance with the past and ongoing dredging of inlets by the US Army Corps of Engineers. In addition, development from the towns such as Nags Head and Buxton has adversely impacted storm water runoff that enters the ocean and estuarine waters. Overall impacts have been long-term minor adverse. Continued development, and increased tourism in the future would possibly increase the adverse impacts to water quality.

### ***Conclusion***

The impacts of Alternative A would not change water quality, and marine and estuarine resources of the Cape Hatteras National Seashore and they would not contribute to the moderate adverse impacts of the past and future development on the Outer Banks.

### **Impacts of Alternative B, the NPS Preferred Alternative**

Alternative B, the preferred alternative, would include 29 proposed public access facilities. Facilities including unpaved ORV ramps, parking areas, handicap accessible boardwalks, foot trails, road improvements, and an unpaved interdunal road. The goal of these projects is to enhance pedestrian access in areas closed to ORVs, and ensure ORV access to the areas that are open to ORVs. Adverse impacts to water quality would occur from activities that create increased sedimentation, erosion, or runoff. Potential impacts to aquatic, benthic and/or tidal flat habitats are considered under the “Wildlife” section.

### ***Parking areas***

As described in Chapter 2, the proposed 14 parking areas, access road, and elevation of Lighthouse Road would be developed either on existing asphalt or a hardened pervious surface would be used that includes concrete or brick pavers typical to the area that allows for drainage and minimum runoff. None of the parking areas are immediately adjacent to waterways so any gasoline or oil leakage from vehicles would runoff over land first. Cases where overland flooding occurs during severe storms would be an instance where pollutants from the parking areas could enter directly into the waterways. These impacts would be short-term and minor adverse. The parking areas would not be in violation of Section .0800—Coastal Water Quality Policies or Section .0206 Estuarine Waters since they would not cause degradation of water quality enough to impair traditional uses of the coastal waters. And none of the parking areas are within a shoreline AEC so are not in violation of Section .0209—Coastal Shorelines.

### ***Boardwalks***

The proposed boardwalks would be constructed above ground and would not impact runoff, or sedimentation into waterways. Therefore impacts to water quality, and marine and estuarine resources would be long-term negligible. The boardwalks would not be in

violation of Section .0800—Coastal Water Quality Policies or Section .0206 Estuarine Waters since they would not cause degradation of water quality enough to impair traditional uses of the coastal waters. There are the following two boardwalks are within an estuarine shoreline AEC:

- Site 12: A handicap accessible boardwalk to sound at Haulover Beach Parking Area,
- Site 24: A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke

These boardwalks would be consistent with the Section .0209—Coastal Shorelines policy to conserve and manage the natural features of the estuarine system as they are built above the aground and allow for vegetation growth and sediment movement below them.

### ***ORV Ramps***

The proposed ORV ramp, connector road, and interdunal road projects would be constructed of pervious surface of sand, shell, and clay. As described in the Geology, Topography, and Soils section, increased erosion on the beach side may occur from these projects. However, all of the ramps are proposed to be constructed on the ocean beach side, and the wave dominated water is commonly filled with sediment so increased sediment in the water column would not be an adverse impact on the open ocean side. Impacts from the construction of the proposed ORV ramps would be long-term negligible. The ORV ramps would not be in violation of Section .0800—Coastal Water Quality Policies or Section .0206 Estuarine Waters since they would not cause degradation of water quality enough to impair traditional uses of the coastal waters. And none of the ORV ramps are within a shoreline AEC so are not in violation of Section .0209—Coastal Shorelines.

### ***Foot Trails***

Proposed foot trails would have no impact on water quality, and water and marine resources.

### ***Cumulative Impacts***

Past, present, and planned future activities also have the potential to impact water quality, and marine and estuarine resources at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Past, present, and future actions within the Seashore may have short-term minor to major adverse impacts. In the past, the development of impervious surfaces in the way of roads, ferry landings, and other development on and around the Cape Hatteras National Seashore has concentrated pollutants and increased stormwater runoff. These projects include the building and continued maintenance of NC-17; the building and continued maintenance of the Herbert C. Bonner Bridge; and the construction of Coast Guard, and National Park Service facilities. Impacts to estuarine resource as have occurred as a result of sediment disturbance with the past and ongoing dredging of inlets by the US Army Corps of Engineers. In addition, development from the towns such as Nags Head and Buxton

has adversely impacted storm water runoff that enters the ocean and estuarine waters. Overall impacts have been long-term minor adverse. Continued development, and increased tourism in the future would possibly increase the adverse impacts to water quality.

### **Conclusion**

Impacts to water quality, and marine and estuarine resource would be short-term minor adverse and long-term negligible as a result of Alternative B. These impacts would not contribute further to the long-term minor adverse cumulative impacts.

## **VEGETATION AND INVASIVE SPECIES**

### **Regulations and Policies**

Executive Order 13112 - Invasive Species directs federal agencies to make efforts to prevent the introduction and spread of invasive plant species, detect and monitor invasive species, and provide for the restoration of native species. Invasive species are usually destructive, difficult to control or eradicate, and generally cause ecological and economic harm. A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property.

### **Methodology and Assumptions**

The methods used for estimating the effects of construction on terrestrial vegetation are based upon acreages of potential effects, the type of facility proposed, and the presence of sensitive plant species within or near each of the proposed construction projects. Several community types are present within and near the proposed construction projects. For the impact assessment, the vegetation communities were combined into a single classification – terrestrial vegetation – for making an approximate estimate of effects based on the area of each of the proposed project footprints, and whether an area was paved.

Effects of maintenance and operation were assessed by qualitatively estimating the effects of vehicle and foot traffic in each location. Maintenance and operation (use of the proposed facilities) could impact vegetation surrounding the proposed construction sites by removing or compacting vegetation. Stormwater runoff could also enter upland vegetation adjacent to each of the proposed facilities, especially when asphalt or other impervious surfaces are used. Stormwater runoff could potentially cause erosion and introduce chemicals from asphalt or treated lumber into these areas.

The intensity of the potential effects on vegetation was evaluated using the following system of impact thresholds:

**Negligible:** Individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur. Effects to state-listed or state sensitive plants would not occur.

**Minor:** Effects on native plants would be measurable or perceptible. The natural function and character of the plant community would not be affected, and if left alone, would recover. Effects to state-listed or state sensitive plants would not occur.

**Moderate:** A change would occur in the natural function and character of the plant community in terms of basic properties (e.g., growth, abundance, reproduction, distribution, structure, or diversity) but not to the extent that the basic properties of the plant community change. Effects to state-listed or state sensitive plants would be readily detectable, long-term and localized, with consequences affecting the population level(s) of species. Mitigation measures, if needed to offset adverse effects would likely be successful.

**Major:** Effects on native plant communities would be readily apparent and would substantially and permanently change the natural function and character of the plant types. Effects to state-listed or state sensitive plants would subsequently jeopardize the viability of the resident population and extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Impact duration is described as either short- or long-term. Short-term impacts would be recognized for less than one year, and recovery would occur within one year. Long-term impacts would be recognized for more than one year, and recover would take more than one year.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands.

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, The NPS would not construct the proposed 29 construction projects. Visitors tend to park along NC-12 all along the Seashore to access areas of the beach open to pedestrians and have developed social trails to access the beach. Repeated disturbance of vegetation in the same area over time has caused permanent destruction of the vegetation. Short- to long-term negligible to minor localized adverse effects to vegetation would likely result from Alternative A.

### ***Cumulative Impacts***

Other past, present, and future planned actions within and around the Seashore have the potential to impact vegetation. The other projects and plans that have affected and would affect vegetation in the vicinity of the proposed projects are those identified at the beginning of this Chapter, and include construction of trails, NC-12 improvements, and other construction projects. The terrestrial vegetation on the Outer Banks has developed on the man-made dune system, and would continue to be allowed to develop in the future. A small amount of terrestrial vegetation has been eliminated in the past and would be eliminated in the future as a result of the various other proposed paving projects, but this would be a minor effect on vegetation when compared with the effects

of dune creation and stabilization projects. The cumulative effects of past, ongoing and future actions on terrestrial vegetation are estimated to be long-term minor adverse as well as beneficial. This artificial, man-made system is being perpetuated through the use of terrestrial vegetation that binds and stabilizes the artificial dune system.

### **Conclusion**

Impacts from the No Action Alternative would occur from repeated disturbance of vegetation in the same area over time from Seashore visitors parking in non-designated areas along the Seashore. Short-to long-term negligible to minor localized adverse effects to vegetation would occur. The overall combination of impacts of these projects with other past, present, and future projects would have long-term minor adverse as well as beneficial impacts. Beneficial vegetative impacts have and would occur from dune creation and stabilizing projects along and adjacent to the Seashore.

### **Impacts of Alternative B, the NPS Preferred Alternative**

Up to a total of approximately 26 acres of terrestrial vegetation would be directly disturbed by the construction and operation of the proposed facilities throughout the Seashore. Native vegetation in each location would be degraded and an increase in abundance of invasive species could occur. Common reed (*Phragmites australis*) is one invasive species found on the Seashore that occurs primarily in disturbed habitat. This species can completely dominate an area, excluding native wetland plants (NPS n.d.). Any fill material and seed mixtures (along reshaped dunes) would be made up of native materials and native plant mixes to minimize the spread of invasive species.

Vegetation within and surrounding the proposed projects would be crushed or eliminated by machinery during construction of each facility. After installation, terrestrial vegetation could be affected by erosion associated with increased stormwater runoff from paved and semi-hard surfaces. These effects would be minimized at the majority of the locations by the use of pervious surface materials. Though minimized, some stormwater could reach adjacent dune vegetation, depending on the size of the rain event. The use of ORVs and Seashore construction and maintenance equipment would contribute grease, oil, and trace metals to the stormwater runoff, but due to the size of the proposed projects and the use of pervious surfaces at the majority of these locations, impacts to adjacent vegetation would be minimal.

Continued use and the possible new development of social trails near some of the proposed locations directly results in the degradation of native vegetation and an increased abundance of invasive species. Measures would be taken to keep Seashore visitors off of non-designated areas. Signs would be posted along all soundside access points and project footprints would avoid state threatened and sensitive plants to the extent possible. Seashore visitors are currently parking along NC-12 and access roads and ramps. Increasing the amount of Seashore parking would help keep Seashore visitors in designated areas.

Construction would avoid sensitive resources to the extent possible, including state-listed threatened and sensitive plant species. If sensitive resources cannot be avoided,

the Seashore would mitigate impacts to the resource. High numbers of dune bluecurls were found in some of the proposed project locations and cannot be avoided. To minimize adverse impacts to this species, the Seashore would survey the extent of the population and establish resource closures along the interdunal road to prevent pedestrian impacts to bluecurl populations. The Seashore would also collect and store enough seed for the propagation of 2,000 plants. The seeds would be collected in the fall after seeds ripen. Seeds would be collected from plants that would be destroyed along the route of the proposed interdunal road. These plants would be used to restore vegetation in areas impacted by inappropriate visitor use. Best management practices would be used in the design and construction of each facility to reduce the spread of invasive species, overall project size, and amount of vegetation disturbed.

Impacts from the majority of the projects would be localized short- to long-term minor adverse. For boardwalks that are proposed eastward of the primary dune line, impacts would be localized short- to long-term negligible adverse due to the lack of vegetation in these areas. For projects that do not require construction (e.g. IDR and Pole Road parking area), impacts would occur from the operation of these facilities and short-term adverse impacts to the surrounding vegetation from construction activities would not occur. Facilities located near state-listed and sensitive plants would have localized short- to long-term moderate effects to vegetation due to indirect impacts from visitor use. Impacts to sensitive plants would be avoided or minimized. Table 4-2 describes and lists the impacts of each proposed facility.

**Table 4-2. Impacts on Vegetation of Each Proposed Facility**

No.	Facility	Vegetation
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	The majority of the proposed location for this facility is paved and the surrounding vegetation is disturbed. Several social trails exist leading from the paved area to the beach. Additional asphalt would be placed in this location to increase the parking area to 0.11 acres. Vegetation would be permanently removed, but the overall community, Dune Grass, would retain its function and character. Construction and operation of the parking area could also affect the surrounding vegetation. Impacts to vegetation would be localized short- to long-term minor adverse.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	The handicap accessible boardwalk at this location would be an extension of the current boardwalk, extending from the current boardwalk to the beach. Up to 0.3 acres of vegetation could be directly disturbed at this location, but some of the vegetation would recover. The overall communities, Dune Grass and Upper Beach, would retain their function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
3	Additional access road from NC 12 to fee station at Coquina Beach	The proposed facility at this location would add up to 0.11 acre of asphalt to the Seashore, permanently removing vegetation in this area. Construction and operation of the parking area could also affect the surrounding vegetation. The overall community, Maritime Shrub, would retain its function and character. Impacts to vegetation would be localized short-to long-term minor adverse.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Up to a total of 0.6 acre of vegetation would be directly disturbed during construction and operation of the proposed parking area and ORV ramp. Surrounding vegetation would be indirectly disturbed from pedestrian and ORV use in the area. The overall vegetation communities, Maritime Shrub, Dune Grass, and Upper Beach would retain their function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Up to a total of .08 acre of vegetation would be directly affected by construction and operating the proposed parking area at this location. Additional vegetation would be impacted along the proposed foot trail. The state-listed moundlily yucca grows along the start of the proposed foot trail where it meets the proposed parking area. The proposed footprint would avoid the moundlily yucca in this area. Any impacts to this plant would be localized and indirect and occur from operation of the foot trail. Construction activities would avoid areas with sensitive plants. Impacts to vegetation would be localized short- to long-term minor adverse.
6	A 20-car parking area and handicap	Up to a total of 0.61 acre of vegetation would be directly disturbed during construction and operation of the proposed parking area and boardwalk. The overall vegetation communities, Maritime Dry

No.	Facility	Vegetation
	accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Up to a total of 0.31 acre of vegetation would be directly disturbed during construction and operation of the proposed parking area. Additional vegetation would be impacted along the proposed foot trail. The overall vegetation communities, Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Up to a total of 1.02 acres of vegetation would be directly disturbed during construction and operation of the ORV ramp and proposed parking area. Additional vegetation would be impacted along the proposed foot trail or boardwalk. The overall vegetation communities, Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Up to a total of 0.20 acres of vegetation would be directly disturbed during construction and operation of the proposed parking area. Additional vegetation would be impacted along the proposed foot trail. The overall vegetation communities, Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Up to a total of 0.85 acres of vegetation would be directly disturbed during construction and operation of the proposed parking area and ORV ramp. Additional vegetation would be impacted along the proposed foot trail. The overall vegetation communities, Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
11	A handicap accessible boardwalk at Ramp 34	Up to a total of 0.16 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover. The overall vegetation communities, Maritime Shrub, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
12	A handicap accessible boardwalk to sound at Haulover	Up to a total of 0.02 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.

No.	Facility	Vegetation
	Beach Parking Area	
13	A 15-car parking area west side of highway at/near Kite Point	Up to a total of 0.29 acre of vegetation would be directly disturbed during construction and operation of the parking area. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Up to a total of 0.19 acre of vegetation would be directly disturbed during construction and operation of the parking area. A well-established trail in this location would be marked for the proposed foot trail. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
15	A 5-car parking area west side of highway at/near soundside access 60	Up to a total of 0.07 acre of vegetation would be directly disturbed during construction and operation of the parking area. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	The proposed 50-car parking area in this location would utilize pre-existing asphalt from the former Buxton Coast Guard Station. The area has previously been disturbed and additional impacts to vegetation would only occur from the handicap accessible boardwalk (0.06 acres). Impacts to vegetation would be localized short-to long-term negligible adverse.
17	A handicap accessible boardwalk at Lighthouse Beach	Up to a total of 0.07 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover and a portion of the proposed location is open space. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	The proposed parking area would occur on an existing paved area at this location and direct impacts to vegetation would not occur. The boardwalk would be elevated, to allow sunlight to reach the vegetation. The vegetation communities surrounding the parking area, Maritime Shrub and Maritime Wet Grassland would retain their function and character. Vegetative communities surrounding the

No.	Facility	Vegetation
		<p>proposed handicap accessible boardwalk, Maritime Wet Grasslands, Maritime Dry Grassland, Dune Grass, and Upper Beach, would retain their character and function. While sensitive plants are located between the proposed parking area and proposed boardwalk and include blue witch grass and dune bluecurls. No construction would occur in these areas and the old access road in this area would be designated for visitor use. Impacts to vegetation would be localized short- to long-term minor adverse.</p>
19	<p>An elevated section of Lighthouse Road to address flooding at ramps 43 and 44</p>	<p>A section of Lighthouse Road (1.34 acres) would be elevated to reduce flooding in this area. Indirect impacts to vegetation along the side of the road could occur. State-listed plants encountered surrounding Lighthouse Road include blue witch grass and moundlily. Protective measures would be taken to avoid adverse impacts to these plants during construction. After construction, the road would be used as it is currently being used. Impacts to vegetation would be localized short-term moderate adverse.</p>
20	<p>An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach</p>	<p>The IDR would be primitive and would not include the addition of any hardened or semi-hardened material. Vegetation would be crushed from ORVs along the marked IDR. The IDR was aligned to avoid state-listed blue witch grass and moundlily yucca. High numbers of dune bluecurls were found in this and cannot be avoided. To minimize adverse impacts to this species, the Seashore would survey the extent of the population and establish resource closures along the interdunal road to prevent pedestrian impacts to dune bluecurl populations. The Park would also collect and store enough seed for the propagation of 2,000 plants. The seeds would be collected in the fall after seeds ripen. Seeds would be collected from plants that would be destroyed along the route of the proposed interdunal road. These plants would be used to restore vegetation in areas impacted by inappropriate visitor use. Impacts to vegetation would be localized long-term moderate adverse.</p>
21	<p>Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground</p>	<p>Up to one acre of vegetation would be disturbed by expanding the existing parking area and adding a pull off area to Billy Mitchell Road. Additional disturbance would occur from the proposed connector ramp at Ramp 49. This project would require grading and fill for the pull out area but native materials would be used. The Seashore would also cut back oaks in this area to make it more accommodating to visitors. The state-listed rare plant species dune bluecurls was encountered at this location during 2012 surveys. While one location was mapped this species occurs along both sides of the road leading up to the existing parking area. The Seashore would avoid plants at this location to the</p>

No.	Facility	Vegetation
		extent possible. If avoidance is not possible, mitigation is discussed above under site number 20. Impacts to vegetation would be localized short- to long-term moderate adverse.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Up to a total of 0.03 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover and a portion of the proposed location is open space. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Up to a total of 0.39 acre of vegetation would be directly disturbed during operation of the parking area. The overall vegetation communities, Maritime Dry Grassland, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse. While a group of dune bluecurls occur near the proposed parking area, operation of the parking area would avoid this area. Impacts to vegetation would be localized short- to long-term minor adverse.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Up to a total of 0.08 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover and a portion of the proposed location is open space. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
25	An ORV Ramp 59.5 at north Ocracoke	Up to a total of 0.31 acre of vegetation would be directly disturbed during construction and operation of the ORV ramp. The overall vegetation communities, Maritime Shrub, Dune Grass, and Upper Beach, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Up to a total of 0.14 acre of vegetation would be directly disturbed during construction and operation of the parking area. The overall vegetation community, Maritime Dry Grasslands, would retain their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
27	An ORV Ramp 63 across from	Up to a total of 0.17 acre of vegetation would be directly disturbed during construction and operation of the parking area. The overall vegetation communities, Dune Grass and Upper Beach, would retain

No.	Facility	Vegetation
	Scrag Cedar Road	their overall function and character. Impacts to vegetation would be localized short- to long-term minor adverse.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Up to a total of 0.02 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover and a portion of the proposed location is open space. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Up to a total of 0.03 acre of vegetation would be directly disturbed during construction and operation of the boardwalk, though some of this area would recover and a portion of the proposed location is open space. While a well-established group of morning-glory near the propose boardwalk, construction and operation of the boardwalk would avoid this area. The overall vegetation communities would retain their overall function and character. Impacts to vegetation would be localized short- to long-term negligible adverse.

### ***Cumulative Impacts***

Other past, present, and future planned actions within and around the Seashore have the potential to impact vegetation. Similar to the No Action Alternative, other projects and plans that have affected and would continue to affect vegetation in the vicinity of the proposed projects are those identified at the beginning of this chapter, and include construction of trails, electric pole maintenance and replacement, NC-12 improvements, other construction projects. The terrestrial vegetation on the Outer Banks has developed on the man-made dune system, and would continue to be allowed to develop in the future. A small amount of terrestrial vegetation has been eliminated in the past and would be eliminated in the future as a result of the combination of the proposed projects and various other proposed paving projects. Although the proposed projects would directly impact up to approximately 26 acres along the entire Seashore, this would be a minor effect on vegetation when compared with the effects of dune creation and stabilization projects. The cumulative effects of past, ongoing, and future actions on terrestrial vegetation are estimated to be long-term minor adverse as well as beneficial to overall vegetative communities. The cumulative effects of past, ongoing, and future actions to state-listed and sensitive plants would be long-term moderate adverse. The Seashore's proposed mitigation for the sensitive dune bluecurl would help minimize adverse effects due to the construction and operation of the proposed action as well as other visitor use projects along the Seashore.

### ***Conclusion***

Overall, the majority of the projects would have localized short- to long-term negligible to minor adverse effects to vegetative communities. Projects located near sensitive resources, including state-listed plant species would have localized short- to long-term moderate adverse effects to vegetation. Any impacts to sensitive plants would be avoided or mitigated. Cumulative effects from past, ongoing, and future actions would be long-term minor to moderate adverse as well as beneficial.

## WETLANDS AND FLOODPLAINS

### Regulations and Policies

Impacts on wetlands and floodplains are addressed under two federal executive orders: Executive Order 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management. NPS Director's Order 77-1 established policies, requirements, and standards for implementing Executive Order 11990 for wetlands, while NPS Director's Order 77-2 applies to all NPS-proposed actions that could adversely affect the natural resources and functions of floodplains, including coastal floodplains, or increase flood risks.

According to Director's Order 77-1 and accompanying Procedural Manual 77-1, direct or indirect adverse impacts on wetlands should be avoided, or where impacts cannot be avoided, degradation or loss must be minimized by every practicable effort. The order adopts a "no net loss of wetlands" policy and states that the NPS would use the Cowardin classification system as the standard for defining wetlands for purposes of compliance with Executive Order 11990. Any NPS activities that involve the discharge of dredge or fill materials into wetlands or "other waters of the United States" must also comply with the *Clean Water Act* and Section 404 regulations (33 CFR 1344) and Section 10 of the Rivers and Harbors Act (33 CFR 403), which prohibits the unauthorized obstruction or alteration of navigable waters of the United States.

If adverse impacts to wetlands would occur from one or more of the proposed projects, a Statement of Findings is prepared; unless the actions are exempted for the various reasons provided in Procedural Manual 77-1 including scenic overlooks and foot/bike trails or boardwalks. Also, actions impacting artificial wetlands may be exempted from the Statement of Findings requirement, if, after evaluation of impacts on wetland functions and values, the anticipated wetland loss or degradation is determined to be minor. As described more fully in the impact analysis, the rebuilding or expansion of any parking areas, access roads, or ORV ramps would be limited to development in non-wetland areas or within artificial wetlands (drainage ditches along NC-12). In addition any impact to an artificial wetland from any one of the proposed facility would not exceed 0.1 acres. Indirect impacts may include minor effects from runoff to nearby wetlands. Impacts related to the operation, management, or improvement of access for ORVs and pedestrians would not require a Statement of Findings because new areas would not be opened up for ORV use in non-artificial wetlands. For these reasons, and as further detailed under the impact analysis, a Statement of Findings for wetlands was not required for this project.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers issues permits for activities that result in the discharge of dredged or fill material into waters of the United States, including wetlands. Regulated activities range from depositing fill for building pads or roads to discharges associated with mechanized land clearing. Although portions of the Corps of Engineers 404 permit procedures (33 CFR 320-330) are similar to some of the requirements found in DO #77-1 and these implementing

procedures, there are significant differences in scope that warrant a separate NPS wetland protection process.

General Permits from the U.S. Army Corps of Engineers are issued nationwide or regionally for a category or categories of activities that are either similar in nature and cause only minimal individual and cumulative adverse impacts (Nationwide and Regional General Permits) or would result in avoiding unnecessary regulatory control exercised by another federal, state, or local agency and the environmental consequences of the activity would be individually and cumulatively minimal (Programmatic General Permit). General Permits always include terms and conditions for compliance and may require preconstruction notification of the U.S. Army Corps of Engineers (33 CFR 320.1 (c), 322.2 (f), 323.2 (h), 325.2 (e)(2), and 330).

As described more fully in the impact discussion, some of the proposed construction projects would result in wetland impacts on less than 0.1 acres each in drainage ditches along NC-12. These projects are covered by the 2012 U.S. Army Corps of Engineers Nationwide Permit 19, Minor Discharges (USACE 2012a) and Nationwide Permit 46, Discharge in Ditches (USACE 2012b) and do not require a pre-construction notification to the district engineer because:

- The quantity of discharge material and the volume of area excavated would not exceed 25 cubic yards below the plane of the ordinary high water mark or the high tide line;
- The discharge would not cause the loss of more than 0.1 acre of waters of the United States at any one proposed construction site; and
- The discharge would not be placed for the purpose of a stream diversion (USACE, 2012a).

Director's Order 77-2 states that when it is not practicable to locate or relocate development or inappropriate human activities to a site outside of and not affecting the floodplain, the NPS would prepare and approve a Statement of Findings, in accordance with procedures described in Procedural Manual 77-2, Floodplain Management, and take all reasonable actions to minimize the impact to the natural resources of floodplains. Because the study area is located entirely within a floodplain, and the action alternatives include construction of additional parking areas (or expansion of existing parking areas) and access in the floodplain, the NPS prepared a Statement of Findings (SOF) for the 2010 ORVMP EIS in accordance with procedures described in Procedural Manual 77-2. Due to the addition of projects not covered by the 2010 ORVMP EIS, a SOF for Floodplains will be prepared for this EA.

NPS Management Policies 2006 also specifically addresses wetlands and floodplains in Section 4.6.5 and 4.6.4, respectively. Section 4.6.5 refers to compliance with Executive Order 11990 and states that, when practicable, the NPS would not simply protect but would also seek to enhance wetland values. For any proposed new development or other activities that could adversely impact wetlands, the NPS would first avoid impacts, then minimize impacts, and the compensate for impacts on at least a one-to-one basis

for any adverse impacts affecting more than 0.1 acres of wetlands. Section 4.6.4 states that the NPS would protect, preserve, and restore the natural resource function of floodplains, avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains, and avoid floodplain development that could cause adverse impacts of flood risks.

## **Methodology and Assumptions**

To assess the magnitude of impacts to Seashore wetlands and floodplains for each proposed project, wetland types and floodplain boundaries were identified as needed for impact analysis, based on the sources described in Chapter 3: Affected Environment. The methods used for estimating the effects of construction on wetlands and floodplains are based upon acreages of potential effects, the type of facility proposed, and the use of best management practices. Each proposed project was assessed independently of the other proposed projects because the implementation of any one project does not affect the implementation of any other proposed project under this EA. Overall impacts of all of the proposed construction projects as well as from other past, present, and future projects were addressed under cumulative impacts.

Effects of maintenance and operation were assessed by qualitatively estimating the effects of vehicle and foot traffic on wetlands and floodplains in each location.

Maintenance and operation (use of the proposed facilities) could impact wetlands surrounding the proposed construction sites by removing or compacting vegetation.

Stormwater runoff could also enter wetland vegetation adjacent to some of the proposed facilities, especially when asphalt or other impervious surfaces are used.

Stormwater runoff could potentially cause erosion and introduce chemicals from asphalt or treated lumber into these areas.

Assumptions made in assessing potential impacts to floodplains include the following:

- The floodplains in the project area do not serve the same function (i.e., as a natural moderator of floods) as floodplains in non-coastal areas because water levels in the project area are not dependent on floodplain storage capacity. Rather the project area is subject to coastal flooding caused by both hurricanes and other storm systems that can raise water levels substantially via storm surge.
- Recreational ORV use in the project area would not result in impacts to floodplain functions or values. The only impacts to floodplains from the implementation of the alternatives would be those impacts associated with proposed construction activities.

The intensity of the potential effects on wetlands and floodplains were evaluated using the following system of impact thresholds:

**Negligible:** There would be no measurable or perceptible effects on wetland plant and animal populations, soils, or hydrology. The effects would be below or at the lower levels of detection (0.0 to 0.01 acres). There would be no change in the ability of a

floodplain to convey floodwaters, or changes in its values and functions. Actions taken would not contribute to a flood.

**Minor:** Effects on wetland plant and animal populations, soils, or hydrology would be measurable or perceptible. Mortality of individual plants and animals might occur, but the viability of the entire wetland populations and habitats would not be affected and the community, if left alone, would recover. Changes in wetland soils or hydrology might occur but if left alone, the overall wetland would recover in time. The effects to wetlands would be detectable and relatively small in terms of area (0.01 to 0.10 acres) and the nature of the change. The action would affect a limited number of individuals of plant or wildlife species within the wetland. Changes in the ability of a floodplain to convey floodwaters, or changes in its values and functions, would be measurable. Actions taken would not contribute to flood potential. No mitigation would be needed.

**Moderate:** A readily measurable change in abundance, distribution, quantity, or quality of populations of plants and animals would occur. Readily measurable changes in soils or hydrology would occur. The wetland would be slow to recover from these changes, or might not recover fully over time. Mitigation measures would be necessary to offset adverse effects, and would likely be successful. The effects to wetlands would be readily apparent over a relatively small area (0.10 acres to 1.0 acres) but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measurable effect on plant or wildlife species within the wetland, but all species would remain indefinitely viable. Changes in the ability of a floodplain to convey floodwaters, or changes in its values and functions, would be measurable. Actions taken could contribute to flood potential. The impact could be mitigated by modification of proposed facilities in floodplains.

**Major:** A readily measurable change in abundance, distribution, quantity, or quality of populations of plants and animals would occur. Readily measurable changes in soils or hydrology would occur. The wetland would be slow to recover from these changes, or might not recover fully over time. Mitigation measures would be necessary to offset adverse effects, and would likely be successful. The effects to wetlands would be readily apparent over a relatively small area (0.10 acres to 1.0 acres) but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measurable effect on plant or wildlife species within the wetland, but all species would remain indefinitely viable.

Changes in the ability of a floodplain to convey floodwaters, or changes in its values and functions, would be measurable and, widespread. Actions taken would contribute to flood potential. The impact could be mitigated by modification of proposed facilities in floodplains, and the success of mitigation measures could not be assured.

**Impact duration** is described as either short- or long-term. Short-term impacts would be recognized for one year after construction of a project is complete, and recovery would occur within one year after construction. Long-term impacts would be recognized for more than one year after construction, and recover would take more than one year.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands.

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, The NPS would not construct the proposed 29 construction projects. There would be no new construction of ORV ramps, IDRs, access roads, parking areas, elevation of roads, or boardwalks and therefore no direct adverse impacts to Seashore wetlands or floodplains would result from construction activities and operation activities associated with the proposed 29 visitor use facilities. Protective signage would not be placed along proposed soundside access points to protect wetlands. The only other actions associated with this alternative that could result in wetland impacts would be impacts from Seashore visitors parking along NC-12 to access areas of the beach open to pedestrians and associated social trails created. Repeated disturbance of vegetation in the same area over time has caused permanent destruction of the vegetation. Localized, long-term negligible to minor adverse impacts to wetlands would likely result from Alternative A in Seashore areas opened to pedestrians.

#### Floodplains

Seashore floodplains would remain as described. Therefore, Alternative A would have no impact on floodplains in the study area.

### ***Cumulative Impacts***

#### Wetlands

The primary effect of past, ongoing and reasonably foreseeable actions on wetlands on the island has been the establishment of a complex, vegetated dune system and the resulting establishment of high-quality wetlands inland from the backdune. Projects that have and could continue to impact the establishment of the dune system includes, but is not limited to:

- Storm and other weather events;
- Hurricane and other storm recovery;
- Berm construction and maintenance by the Civilian Conservation Corps;
- Berm maintenance;
- North Carolina Department of Transportation (NCDOT) Recovery Efforts;
- NCDOT Sandbag and Dune Rebuilding;
- And NC-12 improvements.

See the beginning of this Chapter for a complete list of cumulative projects that could result in the establishment of dune systems along the Seashore. These conditions would continue under Alternative A, having long-term beneficial impacts. Projects that

result in the loss of wetlands within the study area have and would continue to occur, having long-term adverse effects on the Seashore's wetlands. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting wetlands are considered, the resulting cumulative effects of Alternative A would be both beneficial and localized long-term moderate adverse impacts.

### Floodplains

Past dune construction and stabilization activities and any proposed new dune construction and stabilization activities would have the consequences of altering flood regimes and natural processes. However, these actions would not contribute to flood potential. Alternative A would not change these effects. When the adverse effects of other past, ongoing, and future plans, projects and activities affecting floodplain values and functions are considered, the resulting cumulative effects of Alternative A would be localized long-term minor and adverse.

### **Conclusion**

While Alternative A would not have any impact on floodplains, long-term negligible to minor localized adverse impacts to wetlands would occur. Overall, there would be no impairment of wetland functions and values from park actions taken under this alternative. Cumulative impacts on wetlands would be beneficial and long-term localized moderate adverse. Cumulative impacts on floodplains would be long-term minor adverse.

### **Impacts of Alternative B, the NPS Preferred Alternative**

#### Wetlands

Under this alternative, impacts to wetlands would either be avoided or minimized at each proposed facility. This has been achieved through early identification of wetlands around each of the proposed facilities and shifting the proposed footprint alignment or reducing the footprint size to avoid adding fill to wetlands and to minimize adverse impacts on wetlands when possible. Wetland surveys were conducted in the summer of 2012 and the results from these surveys were utilized to determine the location of the proposed parking areas, ramps, access road, interdunal road, boardwalks, and foot trails.

Where wetland impacts could not be avoided due to access requirements of ORVs, access roads, or parking areas, fill would be added to less than 0.1 acres of a wetland area. Wetland areas that cannot be avoided due to access requirements are located in drainage ditches along NC-12 and include:

- Additional access road from NC-12 to fee station at Coquina Beach;
- A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach;
- An ORV Ramp 25.5 with parking area and foot trail or boardwalk to the beach;
- A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48; and

- An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach.

NPS would use culverts for ramps, parking areas, and roads within wetlands along NC-12 ditches to maintain flow and avoid flooding. If any dewatering of wetland areas is required at any of the proposed construction sites, no more than 0.1 acres of wetlands would be impacted at any site. Culverts would also be used to minimize impacts to wetlands and restore the hydrology at the portion of Lighthouse Road that is proposed for elevation. This portion of Lighthouse Road is subject to flooding during storm events and the proposed project at this location would elevate the road and minimize flooding in this area. While fill would be used to elevate the road, no fill would be placed in wetlands surrounding the road.

Wetlands occur adjacent to many of the proposed facilities. Construction activities would avoid wetlands and use environmentally sensitive standards and best management practices to minimize the potential for effects of soil erosion and surface runoff on wetlands. During operation of the proposed facilities, motorized vehicles could contaminate stormwater runoff with grease, oil, and trace metals. Seashore visitors could also trample wetland vegetation and compact wetland soil. The majority of the proposed parking areas and ramps would be constructed with hardened pervious surfaces to reduce and or eliminate runoff and stagnant water bodies. Asphalt would be used to widen the parking area at the former site of the U.S. Coast Guard Station, for the proposed access road at the Coquina Beach fee stations, and to add a pull off area and additional parking spaces on Billy Mitchell Road at Ramp 49. To protect soundside wetlands and vegetation, protective signage would be installed at all soundside access points. For the proposed boardwalk at Loran Road, the boardwalk would be elevated to allow sunlight to reach vegetation and minimize impacts to wetlands.

Seashore visitors are currently parking along NC-12 and ORV ramps to access the beach and sound. The proposed ramps, interdunal road, parking areas, boardwalks, and foot trails would help keep Seashore visitors within a designated place and off of wetland areas.

Since a high degree of avoidance and minimization have been achieved in the planning stage and pervious surfaces would be utilized for the majority of the proposed parking areas and ORV ramps, the construction and operation of proposed action would have localized, short- and long-term negligible to minor adverse effects on wetlands adjacent to any of the proposed facilities. The construction and operation of the proposed boardwalk at Loran Road would also have localized short- and long-term minor adverse effects on wetlands. Where asphalt is used near wetland areas effects would be localized short- and long-term minor adverse. The construction and operation of ORV ramps or access road within wetlands would have short- and long-term moderate adverse effect on wetlands. Table 4-3 lists the anticipated effects at each location.

Overall wetlands would maintain their functionality in the Seashore. The area impacted at each proposed facility under Alternative B is less than 0.10 acres (4,356 square feet)

and any fill added to wetlands would occur in artificially made wetlands. Therefore, the proposed action is exempted from the Statement of Findings and compensation requirements of Procedural Manual #77-1: Wetland Protection.

### Floodplains

The use of vehicles for recreational access and Seashore operations would not result in any impacts to floodplain functions or values. However, the proposed facilities and construction activities have the potential to impact the floodplain, as discussed below.

Because all of the area between access roads (interdunal or NC-12) and the shoreline is in the 100-year floodplain, no options for constructing the proposed facilities outside of the regulatory floodplain exist. All of the parking areas would be located within the 100-year floodplain, with none of the new or expanded lots located in areas seaward of the primary dune line. New or expanded parking areas would be located outside of coastal high hazard areas subject to flash flooding, when possible. Although Director's Order 77 allows the construction of day-use parking facilities within the 100-year floodplain in high hazard areas, signs informing visitors of flood risk and suggested actions in the event of flooding must be posted, and are included as part of this alternative.

The majority of new or expanded parking areas would be designed and constructed with a semi-permeable clay/shell base, other porous material, using environmentally sensitive standards to minimize stormwater runoff. The construction or expansion of the parking areas would result in the placement of hardened, pervious surface in the 100-year floodplain and would have a limited effect on the ability of the floodplain to convey floodwaters from storm surge. Parking areas with hardened, pervious surfaces would have localized, long-term minor adverse impacts. The use of asphalt would be limited to three of the proposed facilities.

Parking areas within the Coastal High Hazard Area include:

- A 10-car parking area at the former site of the U.S. Coast Guard Station on Bodie Island,
- An Off-Road Vehicle (ORV) Ramp and 10-Car Parking Area on 0.5 Miles South of Coquina Beach (New Ramp 2.5),
- A 5-car parking area west side of highway at/near soundside access 60, and
- A 5-car parking area at the west side of highway entrance of Borrow Pit Road.

The 10-car parking area at the former site of the U.S. Coast Guard Station on Bodie Island would expand the existing asphalt 20 meters to the east. Less than 0.11 acres of the 100-year floodplain would be converted to asphalt in this area. The parking area at the former site of the U.S. Coast Guard Station on Bodie Island would have localized long-term moderate adverse impacts.

Approximately 0.11 acre of asphalt would be placed at Coquina Beach for the proposed access road and less than 1 acre of asphalt would be used at Ramp 49 for the

proposed pull off area and parking area expansion. Both of these facilities would have localized, long-term minor adverse impacts on Seashore floodplains.

The proposed access road, elevation of Lighthouse Road, and the widening of Ramp 49 are not located within the Coastal High Hazard Area. While the elevation of Lighthouse Road would include fill material and asphalt, the width of the road would not increase. Culverts would also be used to restore the wetland hydrology at this location. Beneficial impacts to floodplains would result due to elevating a portion of Lighthouse Road from the reduction of flooding and hydrology restoration.

The interdunal road proposed under this alternative would extend from the existing interdunal road at ramp 45 to ramp 49. The road, constructed at grade, would not alter topography or require a finished surface, limiting the potential for impacts to floodplain function. The establishment of the interdunal road would not result in floodplain impacts. Foot trails and boardwalks would also not result in floodplain impacts because the trails would be primitive sand trails and would not be paved or surfaced and boardwalks would be constructed with treated wood.

Ramps would be surfaced with a natural hardened pervious surface, reducing stormwater runoff and limiting the potential for impacts to the floodplain's function. The construction of ramps would impact primary and frontal dunes on the National Seashore. The artificial dunes of the Seashore provide protection from overwash damage to the soundside. To minimize impacts to dunes and overwash damages, ramps would be constructed up and over dunes and would not cut through a dune or raised area. Dunes may have to be re-shaped at a ramp to allow for proper drainage, safe driving conditions, and to reduce vehicle obstacles and impacts to vegetation. Also, ramps would be constructed with a five percent slope or less. Impacts from the construction and operation of ORV ramps are therefore expected to be localized, long-term minor adverse. Table 4-3 lists the anticipated effects at each proposed facility for Alternative B.

The NPS requires development of a SOF describing the impacts to floodplain resources when it is not practicable to locate or relocate the proposed development to a site outside and not affecting the floodplain (NPS 2004). FEMA Flood Insurance Rate Maps show that the project area is within 100-year-flood floodplain.

### ***Cumulative Impacts***

#### Wetlands

Past, present, and future planned actions that have the potential for cumulative impacts on wetlands under Alternative B would be identical to those described under Alternative A. Besides the projects identified under Alternative A, each project is considered when assessing cumulative impacts on wetlands. The effects of these action when combined with the localized short- to long-term negligible to minor adverse impacts on wetlands would result in long-term minor to moderate adverse impacts on wetlands in the area of analysis.

## Floodplains

Other past, present, and future planned actions within and around the Seashore have the potential to impact floodplains. Past dune construction and stabilization activities and any proposed new dune construction and stabilization activities would have the consequences of altering flood regimes and natural processes. However, these actions would not contribute to flood potential.

The combination of all 29 proposed construction projects would result in no more than 1.22 acres of asphalt to the 100-year floodplain. The dredging of Oregon Inlet has occurred in the past and would continue to occur on an annual basis. Material from the dredging of Oregon Inlet is used primarily for the replenishment of Pea Island National Wildlife Refuge beaches. The deposition of this material has the potential to impact the function of the floodplain if substantial changes to topography resulted in the diversion of floodwaters into developed or inhabited areas. However, due to the dynamic coastal processes that continually reshape the area of deposition and the lack of development in the vicinity, impacts to the floodplain from dredging activities would be negligible at most. The replacement of the Herbert C. Bonner Bridge is likely to affect floodplains because all of the replacement bridge corridor alternatives—as well as the existing Bonner Bridge and NC 12—are within the floodplain. However, the replacement bridge should not have measurable impacts on floodplain values because the piles of the bridge substructure would not create backwater or adverse hydraulic conditions, and floodplain functions would not be expected to be impacted. All alternatives for the replacement of the Herbert C. Bonner Bridge conform to applicable state and local floodplain protection standards because they would not affect the storm surge elevation.

However, the location of structures and impervious surfaces in the floodplain could result in localized flooding during heavy rain events. Other past and planned actions, such as improvements slated for NC-12, the Ocracoke multi-use trail, and the Outer Banks Scenic Byway Committee: Multi-Use Path(s) paved pathways on Hatteras Island would contribute limited adverse impacts to floodplains because they would result in additional development or hardened surfaces in the floodplain that could impact the overall floodplain functions. The overall impacts of these past, current, and future actions on floodplains would be long-term minor to moderate adverse due to the development that would occur in the floodplain and the resulting potential to impact floodplain functions.

Local planning efforts and their policies toward development could also affect floodplains in the surrounding area. Both Dare and Hyde counties recognize the risks associated with floodplain development and support the administration and enforcement of all applicable floodplain management regulations and the National Flood Insurance Program. Almost all of the shoreline in the study area is in a high hazard flood area and would also be protected as an AEC under the CAMA, which limits development in these areas. Impacts to floodplains from local planning policies would be beneficial because the local policies, along with existing federal regulations, would limit development in these areas. However, some level of development would be expected to occur in these areas in the future, so these floodplains would continue to be impacted. The effects of

the actions described above—when combined with the long-term minor adverse impacts to floodplains would result in long-term minor to moderate adverse impacts on floodplains in the area of analysis.

**Conclusion**

There would be localized short- to long-term negligible to minor adverse impacts to wetlands from the proposed projects. Table 4-3 lists the anticipated impact of each project from Alternative B. Cumulative long-term minor to moderate adverse impacts on wetlands are also anticipated.

There would be localized, long-term minor to moderate adverse impacts to floodplains would result from the construction of parking areas, access roads, and ramps. Construction of the interdunal road and placement of the foot trails would have no impacts to floodplains. Also, beneficial impacts to floodplains would result due to elevating a portion of Lighthouse Road from the reduction of flooding and hydrology restoration. Cumulative impacts from past, present, and future projects on floodplains would be long-term minor to moderate adverse.

Table 4-3. Wetland and Floodplain impact at each proposed Facility

Site no.	Facility	Wetlands	Floodplain
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Less than 0.11 acres of asphalt would be added to the 100-year floodplain for this facility and this location is located in Zone VE. This facility would have localized long-term moderate adverse impacts.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Wetlands are not present in this location and no impacts to wetlands are anticipated from the proposed project.	Boardwalks would not impact the floodplain.
3	Additional access road from NC 12 to fee station at Coquina Beach	Localized short- and long-term minor adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	0.11 acres of asphalt would be added to the 100-year floodplain for this facility. This facility would have localized long-term moderate adverse impacts.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Localized short- and long-term minor adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	ORV ramps and parking areas would have localized long-term minor adverse impacts.

Site no.	Facility	Wetlands	Floodplain
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Localized short- and long-term negligible adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed foot trail.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed boardwalk.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Localized short- and long-term minor, adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed foot trail.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Localized short- and long-term minor adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	The parking area and ramp would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed boardwalk.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Localized short- and long-term minor adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Localized short- and long-term minor adverse effects on wetlands due to the placement of fill in less than 0.1 acres of wetlands within drainage ditch along NC-12. Culverts would be placed in wetlands to minimize adverse effects.	The parking area and ramp would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed foot trail.
11	A handicap accessible boardwalk	Wetlands are not present in this location. No impacts to	Boardwalks are not anticipated to have any

Site no.	Facility	Wetlands	Floodplain
	at Ramp 34	wetlands would occur from the proposed facility.	impact on the floodplain.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Localized short- and long-term negligible adverse effects would occur on wetlands adjacent to the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.
13	A 15-car parking area west side of highway at/near Kite Point	Localized short- and long-term negligible to minor adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Localized short- and long-term negligible to minor adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed foot trail.
15	A 5-car parking area west side of highway at/near soundside access 60	Localized short- and long-term negligible to minor adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Localized short- and long-term negligible to minor adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. While asphalt is present at this location, no additional asphalt would be added.
17	A handicap accessible boardwalk at Lighthouse Beach	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Localized short- and long-term minor adverse effects would occur on wetlands adjacent to the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain. No impacts are anticipated from the proposed boardwalk.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Localized short- and long-term minor adverse effects would occur on wetlands adjacent to the proposed facility.	Beneficial impacts would occur at this location from the reduction in flooding and restoring the hydrology.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Localized short- and long-term minor adverse effects would occur on wetlands adjacent to the proposed facility.	No grading would occur at this location and no hardened pervious surface would be

Site no.	Facility	Wetlands	Floodplain
			added. Impacts would not occur to the floodplain from this facility.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Localized moderate adverse impacts would occur from up less than 1 acre of asphalt added to the 100-year floodplain at this location.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Wetlands present at this site are not close to the proposed facility. No impacts to wetlands would occur from the proposed facility.	The parking area would have negligible minor adverse impacts to the Seashore floodplain. No grading would occur at this location and no hardened pervious surface would be added.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.
25	An ORV Ramp 59.5 at north Ocracoke	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	The ramp would have localized long-term minor adverse impacts to the Seashore floodplain.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	The parking area would have localized long-term minor adverse impacts to the Seashore floodplain.
27	An ORV Ramp 63 across from Scrag Cedar Road	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	The ramp would have localized long-term minor adverse impacts to the Seashore floodplain.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Wetlands are not present in this location. No impacts to wetlands would occur from the proposed facility.	Boardwalks are not anticipated to have any impact on the floodplain.



## **WILDLIFE AND WILDLIFE HABITAT**

### **Methodology and Assumptions**

The intensity of the potential effects on wildlife and wildlife habitat was evaluated using the following system of impact thresholds:

**Negligible:** Wildlife and their habitats would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to wildlife populations. Impacts would be well within the range of natural fluctuations.

**Minor:** Effects on wildlife or habitats would be measurable or perceptible, but localized within a small area. While the mortality of individual animals might occur, the viability of wildlife populations would not be affected and the community, if left alone, would recover. Impacts would not be expected to be outside the natural range of variability and would not be expected to have any long-term effects on native species, their habitats, or the natural processes sustaining them. Sufficient habitat would remain functional to maintain viability of all species.

**Moderate:** A change in wildlife populations or habitats would occur over a relatively large area. Effects to wildlife would be readily detectable, long-term, and with consequences at the population level. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. Mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Impacts could be outside the natural range of variability for short periods of time. Sufficient habitat would remain functional to maintain variability of all native wildlife species. Mitigation measures would be necessary to offset adverse effects, and would likely be successful.

**Major:** Effects on wildlife populations or habitats would be readily apparent, long-term, and would substantially change wildlife populations over a large area in and out of the national park. Impacts would be expected to be outside the natural range of variability for long periods of time or to be permanent. Loss of habitat may affect the viability of at least some native species. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.

**Duration:** Temporary impacts would occur only during the time that construction activities are being conducted. Short-term impacts would extend beyond the time of project activities, but would not last more than one to two years. Long-term impacts would extend for several years and beyond the life of the project even if the actions causing the impacts were to cease; they can potentially continue indefinitely, in which case they could also be described as permanent.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands.

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, none of the 29 proposed parking areas, unpaved roads and ORV ramps, foot paths, ADA accessible boardwalks, or road elevations would be constructed. As there would not be any new actions under this alternative, there would not be any new impacts on wildlife or wildlife habitat. There would not be additional human activity at the project sites for construction activities, so wildlife would not be affected beyond current disturbance from regular visitor and vehicle traffic.

### ***Cumulative Impacts***

Wildlife and habitat in the Seashore are subject to disturbance and damage from natural processes, visitor use, facilities construction and maintenance, other park operations, land use plans, and vehicle traffic both on and off road. Wildlife impacts related to these activities include harassment or displacement of individuals, the loss or degradation of habitat, introduction of invasive species, and higher levels of human presence and activity. During activities such as construction, permitted one-time events, highway improvements, habitat restoration, etc., wildlife impacts generally increase in intensity in the short-term during project activity periods; however, the extent of impacts has typically been limited to the immediate vicinity of human activities (e.g., habitat removal or alteration, species displacement or mortality, noise).

Storms and other weather events during the breeding season (March – August) of locally sensitive bird species can result (depending upon storm intensity) in disturbance of nesting state-listed/special status and other birds or even in the washing away of nests or eggs. Powerful storms can surge high up and overwash large areas of breeding habitat including even up to the toe of the dune and beyond and result in loss of scrapes, nests, eggs, chicks and even breeding adults. Conversely, winter, late fall, and early spring storms are capable of being beneficial to birds by depositing new materials and creating overwash areas and hence new nesting habitat or having long-term adverse impacts by eroding and removing otherwise suitable habitat. Hence, the type and level of impacts to nesting birds depends on the timing and severity of storm events and whether they result in net habitat creation or destruction.

Berm construction under the CCC provided dune stabilization that changed the habitat available to all shorebird and other species at the Seashore. These stabilization efforts provided for the establishment of NC-12 and subsequent development, removing this area from potential habitat. These past actions resulted in long-term moderate adverse impacts to all shorebird and other species at the Seashore. Similarly, continual maintenance of NC-12 and berm maintenance would have a short-term, minor to moderate, adverse impact to the extent that it takes place during breeding season and if maintenance results in encroachment on any nest buffers or resource closures. If

encroachment occurs, it could result in habitat loss that would have short-term, minor to moderate, adverse impacts to sensitive species nesting and foraging. The degree to which this activity is negative is a function of the timing and location of the activity itself relative to bird nesting and to the degree to which the activity impacts habitat.

Past, current, and future planning efforts can also affect locally sensitive species. For example, past development that has occurred in Dare and Hyde counties under their land use plans increased the residential housing and related services in the areas within the Seashore. This land development within the Seashore, as well as throughout the counties, has reduced the amount of habitat available to species, resulting in adverse impacts. In addition to past actions, new development could result from the implementation of the County Land Use Development Plans for Dare and Hyde counties, including expected revisions to the Dare County Plan. If increased development within the Seashore's boundaries would result from the implementation of these plans, this may have minor adverse impacts on state-listed/special status and other species because development may result in measurable increases in recreational use, with corresponding increases in recreational impacts to these species.

The Seashore's Predator Management Program implemented under Supervisors order and under NEPA review would provide long-term substantial benefits by helping to control mammalian predators, such as fox and others, which prey upon bird adults, eggs, and young. Predator trapping may result in short-term minor disturbance to nests and young, or result in loss of nests or hatchlings if trappers are not cognizant of nest locations. However, overall predator management actions would be highly beneficial to state-listed or special status bird species.

There would be continued adverse effects on wildlife from ORVs and vehicles using NC-12. Vehicles cause short-term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, and introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Future planned prescribed burning could result in the temporary displacement of wildlife or individual mortality of wildlife species. Fire would have an immediate effect on wildlife and wildlife habitats by removing plant material, exposing soils, stimulating growth of some plants, and killing or reducing the vigor of some plants. The amount of habitat removed may depend on the size, severity, patchiness, and time of year of the burn. The loss of habitat would have an indirect, short-term minor effect by displacing wildlife. However, the restoration of vegetation communities intended by the prescribed burn would have beneficial effects on wildlife and habitat. The ability of animals to survive fire depends on their mobility and on the uniformity, severity, size, and duration of the fire. Some animals, such as insects and small mammals, have limited ability to move over large distances. The direct mortality and displacement of a few localized individuals or groups of animals could occur but would not jeopardize population trends. Wildlife mortality from fire would have a direct, short-term effect on wildlife populations.

These past, present, and reasonably foreseeable cumulative actions would result in minor to moderate negative cumulative impacts wildlife and habitat, and minor beneficial impacts. Alternative A would not contribute any cumulative impacts on wildlife and habitat. Overall cumulative effects on wildlife and habitat would be adverse and minor to moderate over the long-term.

### **Conclusion**

Alternative A would not have any impacts on wildlife and habitat, nor would it contribute any cumulative impacts on wildlife and habitat.

### **Impacts of Alternative B, the NPS Preferred Alternative**

Under Alternative 2, the 29 proposed public access facilities including parking areas, unpaved ORV ramps and roads, foot paths, ADA accessible boardwalks, and elevation of a road segment would be constructed. The proposed facilities would remove up to approximately 26 acres of wildlife habitat throughout the Seashore, not including disturbance from proposed foot trails. At currently unimproved sites where new construction would occur, existing wildlife habitat would be eliminated for the long-term. At other sites there are existing improvements and a portion of the site already contains facilities such as a road, ramp, or parking area; thus additional wildlife habitat may be eliminated, but the entire acreage would not constitute habitat loss. At some sites, like the Loran Road parking site, the parking area would be reduced to the existing disturbed surface, so no loss of habitat would occur at that location. The area of habitat loss for each project site is listed in Table 4-4.

Construction activities at each project site and human presence would cause temporary displacement and disturbance of resident and special status wildlife for the duration of construction. Displaced animals could occupy adjacent areas of similar habitat. Resident and migrant bird species would also be displaced from the areas of disturbance to some degree, although many would also likely utilize similar habitats in adjacent areas. Wildlife in the habitats adjacent to the project sites would be displaced temporarily by construction noise, but may return soon afterwards. Some species may be prevented from using the resources at the project sites due to habitat alteration over the short-term or habitat removal over the long-term; however, the areas of disturbance would be fairly small at each site, with large areas of similar habitat adjacent to project sites. Wildlife occupying the construction site itself would be permanently displaced to other locations where their survival would be reduced because of territorial fights and competition for food and cover. Disturbed areas that are not paved or otherwise hardened would be re-vegetated with native plants after construction, thus restoring as much wildlife habitat as possible.

Impacts to nesting birds would be minimized or avoided if timing of construction activities occurs outside of the bird breeding season. However, it is possible that some construction may occur during the breeding season of some birds. Human-induced disturbance can have negative effect on breeding success by causing nest

abandonment and increased predation. Construction activities are designed so that they are outside of any protected species breeding or foraging habitat.

Construction activities could result in mortality of some wildlife, particularly small mammals, reptiles, amphibians, and invertebrates through individual animals being crushed by construction equipment or being excavated from burrows or other refugia during ground disturbing activities. Given the small amount of habitat disturbance involved and the low number of individuals potentially affected, mortality impacts on wildlife would short-term and minimal.

The potential to negatively affect fish, aquatic organisms, and EFH at some project sites located on the soundside through incidental sediment discharge during construction would be low as activities would be some distance away from surface water. If impacts do occur, they would consist of localized fine sediment deposition or turbidity increases that are likely to cause some juveniles and adults to seek alternative habitat, which is likely to contain suboptimal cover and juvenile forage. Fish that seek suboptimal forage and cover would have increased behavioral stress (avoidance, displacement), and sub-lethal responses (increased respiration, reduced feeding success, reduced growth rates). Best Management Practices during construction would be implemented to eliminate or minimize such impacts to fish, aquatic organisms, and EFH.

Enhanced visitor experiences at the project sites could increase disturbance of wildlife over the long-term as more visitors are likely to use the sites and may spend more time at the areas. There would also be new routine and emergency facilities maintenance activities at the project sites. The effects of public access and maintenance on wildlife can cause adverse responses such as flushing or avoidance, or more indirect or long-term responses such as altered behavior, reduced health and productivity, and changes in abundance or species composition. However, the amount of visitor use in the area would not likely change appreciably from current levels. In this context, new impacts on wildlife relative to existing conditions are expected to be small.

In the unlikely event that state-listed or special status wildlife species are found in a construction area, the area would be under resource closure and no construction would occur until mitigation is implemented. Thus adverse impacts to special status species could be completely avoided in the short-term. In the long-term, adverse effects could occur from visitor use and maintenance activities at the project sites as discussed above.

Table 4-4 lists the impacts on wildlife and habitat at each project site.

**Table 4-4. Wildlife and Wildlife Habitat Impact at Each Proposed Facility**

Site no.	Facility	Proposed Action Wildlife and Wildlife Habitat Impacts
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.11 acres of wildlife habitat.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.03 acres of wildlife habitat.
3	Additional access road from NC 12 to fee station at Coquina Beach	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.11 acres of wildlife habitat.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.60 acres of wildlife habitat.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.08 acres of wildlife habitat.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.61 acres of wildlife habitat.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.31 acres of wildlife habitat.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 1.02 acres of wildlife habitat.
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.20 acres of wildlife habitat.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.85 acres of wildlife habitat.
11	A handicap accessible boardwalk at Ramp 34	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.16 acres of wildlife habitat.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.02 acres of wildlife habitat.
13	A 15-car parking area west side of highway at/near Kite Point	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.29 acres of wildlife habitat.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.19 acres of wildlife habitat.
15	A 5-car parking area west side of highway at/near soundside access 60	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.07 acres of wildlife habitat.

Site no.	Facility	Proposed Action Wildlife and Wildlife Habitat Impacts
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.06 acres of wildlife habitat.
17	A handicap accessible boardwalk at Lighthouse Beach	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.07 acres of wildlife habitat.
18	A 5-car parking area at Loran Road with new handicap accessible boardwalk to the beach	Short- and long-term, localized, direct, negligible, adverse impacts. Loss of 0.16 acres of wildlife habitat.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 1.34 acres of wildlife habitat.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 15.67 acres of wildlife habitat.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 3.04 acres of wildlife habitat.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	Short- and long-term, localized, direct, negligible, adverse impacts. Loss of 0.03 acres of wildlife habitat.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.39 acres of wildlife habitat.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	Short- and long-term, localized, direct, negligible, adverse impacts. Loss of 0.08 acres of wildlife habitat.
25	An ORV Ramp 59.5 at north Ocracoke	Short- and long-term, localized, direct, minor, adverse impacts. Loss of 0.31 acres of wildlife habitat.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.14 acres of wildlife habitat.
27	An ORV Ramp 63 across from Scrag Cedar Road	Short- and long-term, localized, direct, negligible to minor, adverse impacts. Loss of 0.17 acres of wildlife habitat.
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	Short- and long-term, localized, direct, negligible, adverse impacts. Loss of 0.02 acres of wildlife habitat.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	Short- and long-term, localized, direct, negligible, adverse impacts. Loss of 0.03 acres of wildlife habitat.

### ***Cumulative Impacts***

Wildlife and habitat in the Seashore are subject to disturbance and damage from natural processes, visitor use, facilities construction and maintenance, other park operations,

land use plans, and vehicle traffic both on and off road. Wildlife impacts related to these activities include harassment or displacement of individuals, the loss or degradation of habitat, introduction of invasive species, and higher levels of human presence and activity. During activities such as construction, permitted one-time events, highway improvements, habitat restoration, etc., wildlife impacts generally increase in intensity in the short-term during project activity periods; however, the extent of impacts has typically been limited to the immediate vicinity of human activities (e.g., habitat removal or alteration, species displacement or mortality, noise).

Storms and other weather events during the breeding season (March – August) of locally sensitive bird species can result (depending upon storm intensity) in disturbance of nesting state-listed/special status and other birds or even in the washing away of nests or eggs. Powerful storms can surge high up and overwash large areas of breeding habitat including even up to the toe of the dune and beyond and result in loss of scrapes, nests, eggs, chicks and even breeding adults. Conversely, winter, late fall, and early spring storms are capable of being beneficial to birds by depositing new materials and creating overwash areas and hence new nesting habitat or having long-term adverse impacts by eroding and removing otherwise suitable habitat. Hence, the type and level of impacts to nesting birds depends on the timing and severity of storm events and whether they result in net habitat creation or destruction.

Berm construction under the CCC provided dune stabilization that changed the habitat available to all shorebird and other species at the Seashore. These stabilization efforts provided for the establishment of NC-12 and subsequent development, removing this area from potential habitat. These past actions resulted in long-term moderate adverse impacts to all shorebird and other species at the Seashore. Similarly, continual maintenance of NC-12 and berm maintenance would have a short-term, minor to moderate, adverse impact to the extent that it takes place during breeding season and if maintenance results in encroachment on any nest buffers or resource closures. If encroachment occurs, it could result in habitat loss that would have short-term, minor to moderate, adverse impacts to sensitive species nesting and foraging. The degree to which this activity is negative is a function of the timing and location of the activity itself relative to bird nesting and to the degree to which the activity impacts habitat.

Past, current, and future planning efforts can also affect locally sensitive species. For example, past development that has occurred in Dare and Hyde counties under their land use plans increased the residential housing and related services in the areas within the Seashore. This land development within the Seashore, as well as throughout the counties, has reduced the amount of habitat available to species, resulting in adverse impacts. In addition to past actions, new development could result from the implementation of the County Land Use Development Plans for Dare and Hyde counties, including expected revisions to the Dare County Plan. If increased development within the Seashore's boundaries would result from the implementation of these plans, this may have minor adverse impacts on state-listed/special status and other species because development may result in measurable increases in recreational use, with corresponding increases in recreational impacts to these species.

The Seashore's Predator Management Plan provides long-term substantial benefits by helping to control mammalian predators, such as fox and others, which prey upon bird adults, eggs, and young. Predator trapping may result in short-term minor disturbance to nests and young, or result in loss of nests or hatchlings if trappers are not cognizant of nest locations. However, overall predator management actions would be highly beneficial to state-listed or special status bird species.

There would be continued adverse effects on wildlife from ORVs and vehicles using NC-12. Vehicles cause short-term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Future planned prescribed burning could result in the temporary displacement of wildlife or individual mortality of wildlife species. Fire would have an immediate effect on wildlife and wildlife habitats by removing plant material, exposing soils, stimulating growth of some plants, and killing or reducing the vigor of some plants. The amount of habitat removed may depend on the size, severity, patchiness, and time of year of the burn. The loss of habitat would have an indirect, short-term minor effect by displacing wildlife. However, the restoration of vegetation communities intended by the prescribed burn would have beneficial effects on wildlife and habitat. The ability of animals to survive fire depends on their mobility and on the uniformity, severity, size, and duration of the fire. Some animals, such as insects and small mammals, have limited ability to move over large distances. The direct mortality and displacement of a few localized individuals or groups of animals could occur but would not jeopardize population trends. Wildlife mortality from fire would have a direct, short-term effect on wildlife populations.

These past, present, and reasonably foreseeable cumulative actions would result in minor to moderate negative cumulative impacts wildlife and habitat, and minor beneficial impacts. The additional impacts associated with Alternative B would contribute negligible, long-term, adverse cumulative impacts on wildlife and habitat. Overall cumulative effects on wildlife and habitat would be minor to moderate adverse over the long-term.

### ***Conclusion***

Alternative B would have short- and long-term, negligible to minor, localized, direct adverse impacts on wildlife and habitat from construction activities and increased use and maintenance of project sites. Overall, Alternative B would contribute negligible, adverse cumulative impacts on wildlife and habitat.

## **VISITOR USE AND EXPERIENCE**

### **Methodology and Assumptions**

The intensity of the potential effects on Visitor Use and Experience was evaluated using the following system of impact thresholds:

**Negligible:** Visitor access would not be affected, or changes in visitor experience and/or understanding would be below or at the level of detection.

**Minor:** Changes in visitor access and experience would be detectable, although the changes would be slight. Visitors could be aware of effects associated with the alternative, but only slightly.

**Moderate:** Changes in visitor access and experience would be readily apparent. Visitors would be aware of the effects associated with the alternative and would likely express an opinion about the changes

**Major:** Changes in visitor access and experience would be readily apparent and would have important consequences. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

*Duration:* **Short-term** impacts would occur sporadically throughout a year, but would generally last no more than three weeks per year. **Long-term** impacts would occur more than three weeks per year and likely for consecutive years.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke islands

### **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, the No Action Alternative visitors to the Cape Hatteras National Seashore would continue to recreate in large numbers during the summer months at various locations throughout the seashore. Recreation activities that require ORVs to access the locations may be prohibited due to ORV restrictions on certain beaches. In addition, some beach areas that are open to ORVs may not be accessible due a lack of ORV access ramp being present for the ORV-open beach area. These two factors would continue to create frustration and minor adverse impacts to ORV users. This applies also to visitors with disabilities that use ORVs simply to access the beach and not to haul their recreation gear. Visitors with disabilities may continue to experience minor adverse impacts due to the lack of handicap accessible access points on pedestrian only beaches. Beach users that would prefer to use the pedestrian only beach areas may continue to experience areas of beach that they would like to access with no designated parking areas. In addition, pedestrians may find areas of beach that are inaccessible because there is not foot path to the beach where they would like to recreate. Pedestrian users would continue to experience negligible to minor impacts when trying to access the beach for recreation. Overall, all visitors to the Cape Hatteras National Seashore would continue to experience minor adverse impacts as a result of

the change in ORV beach use policy without updating beach access points to better suit the updated needs of visitors.

### ***Cumulative Impacts***

Past, present, and planned future activities also have the potential to impact visitor use and experience at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Erosion and overwash of sand are natural processes that can impede access to or remove recreation locations. This occurs from severe weather events such as hurricanes, tropical storms, and winter low pressure systems. These events may result in short to long-term and minor to major adverse impacts. Present and future construction within the Seashore may have short-term minor to major adverse impacts. This would include construction projects such as maintenance and repair to NC-12 and the Herbert C. Bonner Bridge that could cause closures to beach areas. The dredging of the Oregon Inlet channel may also cause temporary beach closures. Natural resource management of the past, present, and future including species research, and recovery plans may cause short to long-term and minor to major adverse impacts by requiring temporary, seasonal, or year round beach closures. Beneficial impacts come from past, present, and future actions by the National Park Service through continued following of the *Cape Hatteras National Seashore General Management Plan* (1984). The management plan puts visitor needs in consideration when managing seashore resources (NPS, 2010). In addition continued maintenance on NC-12 and the Bonner Bridge would ensure the ability for the road to be useable in the future, creating long-term beneficial impacts to visitor use.

### ***Conclusion***

Overall, the impacts of Alternative A, the no action alternative would have minor adverse impacts as a result ORV users and pedestrian users areas of beach open to their recreation type that are not easily accessible. Combined with past, present and future activities of all types in the Seashore area, the impacts would be long-term negligible to minor adverse attributed to additional beneficial actions taken to facilitate visitor use in the future.

### **Impacts of Alternative B, the NPS Preferred Alternative**

Alternative B, the preferred alternative, would include 29 proposed public access facilities. Facilities including unpaved ORV ramps, parking areas, handicap accessible boardwalks, foot trails, road improvements, and an unpaved interdunal road. The goal of these projects is to enhance pedestrian access in areas closed to ORVs, and ensure ORV access to the areas that are open to ORVs. The intent of this proposed alternative is to enhance visitor use and experience and minimize difficulty of recreation access in the Cape Hatteras National Seashore. Given such, the overall impact to the visitor use and experience would be long-term beneficial. The impact details of each facility are outlined Table 4-5.

**Table 4-5 Impacts by Facility to Visitor Use and Experience**

Site no.	Facility	Impacts to Visitor Use and Experience
1	A 10-car parking at the former site of the U.S. Coast Guard Station on Bodie Island	Formalizing the parking area would decrease visitor confusion, and provide access to the pedestrian only beach. Impacts would be long-term beneficial.
2	A handicap accessible boardwalk at Coquina Beach on Bodie Island	This beach is closed to ORVs, and a handicap accessible boardwalk would allow access to the beach for persons with disabilities. Impacts would be long-term beneficial.
3	Additional access road from NC 12 to fee station at Coquina Beach	This parking area serves as a spot for ORVs to pick up permits and for beach goers to park and walk to the beach. An additional access road into the parking area would reduce congestion, and conflict between the two user groups. Impacts would be long-term beneficial.
4	An ORV ramp and 10-car parking area 0.5 miles south of Coquina Beach (New Ramp 2.5)	The proposed ORV ramp would limit congestion along the open to ORVs stretch of beach by limiting the need to turn around to use the single entrance/exit. The parking area would provide access for pedestrians to use the closed to ORVs section of beach. Pedestrians would have to walk along the ORV Ramp to access the beach, potentially causing a conflict between user groups. Impacts would be long-term beneficial and minor adverse.
5	A 10-car parking area at Ramp 4 with foot-trail to beach	The parking area would facilitate access for pedestrians to this location for recreation. The foot trail would reduce conflicts with pedestrians and ORVs on Ramp 4. Impacts would be long-term beneficial.
6	A 20-car parking area and handicap accessible boardwalk at Ramp 23 (ca. 0.3 mi S of Salvo)	The handicap accessible boardwalk would facilitate access for disabled persons to the portion of beach closed to ORVs. Additional parking at this location would also provide for greater visitation and reducing crowding in the existing parking area. Impacts would be long-term beneficial.
7	A 10-car parking area about 1.0 mile south of Ramp 23 with foot trail to the beach	The parking area and foot trail would facilitate access to the beach for recreation at this currently inaccessible location. Additional parking and access points reduce congestion at existing facilities, creating a more pleasant experience for visitors. Impacts would be long-term beneficial.
8	An ORV Ramp 25.5 with parking area, and foot trail or boardwalk to the beach	The proposed ORV ramp would limit congestion along the open to ORVs stretch of beach by limiting the need to turn around to use the single entrance/exit. The parking area and foot trail would facilitate access to the beach for recreation at this currently inaccessible location. Additional parking and access points reduce congestion at existing facilities, creating a more pleasant experience for visitors. Impacts would be long-term beneficial.

Site no.	Facility	Impacts to Visitor Use and Experience
9	A 5-car parking area and foot trail to beach (beachside) at soundside Ramp 48	The parking area and foot trail would facilitate access to the beach for recreation at this currently inaccessible location. Additional parking and access points reduce congestion at existing facilities, creating a more pleasant experience for visitors. Impacts would be long-term beneficial.
10	An ORV Ramp 32.5 (Little Kinnakeet) with a 10-car parking area and foot trail to the beach	The proposed ORV ramp would limit congestion along the open to ORVs stretch of beach by limiting the need to turn around use only one entrance/exit. The parking area and foot trail would facilitate access to the beach for recreation at this currently inaccessible location. Additional parking and access points reduce congestion at existing facilities, creating a more pleasant experience for visitors. Impacts would be long-term beneficial.
11	A handicap accessible boardwalk at Ramp 34	The handicap accessible boardwalk would facilitate access for disabled persons to the portion of beach closed to ORVs. Impacts would be long-term beneficial.
12	A handicap accessible boardwalk to sound at Haulover Beach Parking Area	The handicap accessible boardwalk would facilitate access for disabled persons to the portion of the soundside beach that is a popular spot for visitors. Impacts would be long-term beneficial.
13	A 15-car parking area west side of highway at/near Kite Point	The proposed parking area would make parking safer, decrease visitor confusion, and provide access to the popular spot for soundside access. Impacts would be long-term beneficial.
14	A 15-car parking area at soundside access #59 with foot trail from highway to beach	The proposed parking area would make parking safer and would decrease visitor confusion, and provide access to the pedestrian only beach. Impacts would be long-term beneficial.
15	A 5-car parking area west side of highway at/near soundside access 60	The proposed parking area would make parking safer and would decrease visitor confusion, and provide access to the pedestrian only beach. Impacts would be long-term beneficial.
16	A 50-car parking area at the former Buxton Coast Guard Station with handicap accessible boardwalk	The handicap accessible boardwalk would facilitate access for disabled persons to the portion of beach closed to ORVs. Parking at this location would also provide for greater visitor experience and reducing crowding in the Lighthouse parking area. Impacts would be long-term beneficial.
17	A handicap accessible boardwalk at Lighthouse Beach	The handicap accessible boardwalk would facilitate access for disabled persons to this popular portion of beach closed to ORVs. Impacts would be long-term beneficial.
18	A 5-car parking area at Loran Road with new handicap accessible	The handicap accessible boardwalk would facilitate access for disabled persons to the portion of beach closed to ORVs. Parking at this location would also provide for

Site no.	Facility	Impacts to Visitor Use and Experience
	boardwalk to the beach	greater pedestrian access and reduce crowding in other locations. Impacts would be long-term beneficial.
19	An elevated section of Lighthouse Road to address flooding at ramps 43 and 44	Repairs to this section of Lighthouse Rd. would prevent access to this portion of the beach from being temporarily closed due to flooding. Impacts would be short-term beneficial.
20	An unpaved IDR between Ramp 45 and 49 with new ORV Ramp 48 to the beach	The proposed unpaved interdunal road would provide ORV access to Ramp 45 from Ramp 49 bypassing the area of beach closed to ORVs. The proposed interdunal road would cross over pedestrian trails to the beach from Frisco Campground, potentially creating conflicts between the two user groups. Proposed Ramp 48 would reduce congestion along the beach open to ORVs by providing a way to return to Ramp 45 by not driving on the beach. Impacts would be long-term minor adverse and beneficial.
21	Widen Ramp 49 and add connector road and 5 car parking area to Billy Mitchell Rd. near Frisco Campground	The proposed action at this location would provide safer conditions yielding a more pleasant experience for visitors. The proposed parking area would make parking safer and would decrease visitor confusion, and provide access to the beach for pedestrians. Impacts would be long-term beneficial.
22	A handicap accessible boardwalk at the Ramp 55 parking area on Hatteras Island	The handicap accessible boardwalk would facilitate access for disabled persons to this popular portion of beach closed to ORVs. Impacts would be long-term beneficial.
23	An unimproved 20-car parking area near the Pole Road/Spur Road intersection	The parking area would facilitate access to the beach for recreation for pedestrians for this area closed to ORVs. Impacts would be long-term beneficial.
24	A handicap accessible boardwalk at/near north ferry terminal parking area on Ocracoke	The handicap accessible boardwalk would facilitate access for disabled persons to being able to watch the ferry come in at this frequently visited location. Impacts would be long-term beneficial.
25	An ORV Ramp 59.5 at north Ocracoke	The proposed ORV Ramp would facilitate ORV users to access the portion of the beach open to ORVs that would not be accessible once Ramp 59 closes. Impacts would be long-term beneficial.
26	A 5-car parking area at the west/north side of highway entrance of Borrow Pit Road	The proposed parking area would make parking safer and would decrease visitor confusion, and provide access to the beach. Impacts would be long-term beneficial.
27	An ORV Ramp 63 across from Scrag Cedar Road	The proposed ORV Ramp would facilitate ORV users to access the portion of the beach open to ORVs, combined with the proposed Ramp 59.5 this would make two access points to this location. This would prevent vehicles from having to turn around on the beach. Impacts would be long-term beneficial.

Site no.	Facility	Impacts to Visitor Use and Experience
28	A handicap accessible boardwalk at the Ocracoke Pony Pens	The handicap accessible boardwalk would facilitate access for disabled persons to this popular portion of beach closed to ORVs. Impacts would be long-term beneficial.
29	A handicap accessible boardwalk at the Ocracoke Day Use Area	The handicap accessible boardwalk would facilitate access for disabled persons to this popular portion of beach closed to ORVs. Impacts would be long-term beneficial.

### **Cumulative Impacts**

Past, present, and planned future activities also have the potential to impact visitor use and experience at the Cape Hatteras National Seashore. Inherent to the Seashores location on a barrier island system, it is a dynamic and constantly changing environment. Erosion and overwash of sand are natural processes that can impede access to or remove recreation locations. This occurs from severe weather events such as hurricanes, tropical storms, and winter low pressure systems. These events may result in short to long-term and minor to major adverse impacts. Present and future construction within the Seashore may have short-term minor to major adverse impacts. This would include construction projects such as maintenance and repair to NC-12 and the Herbert C. Bonner Bridge that could cause closures to beach areas. The dredging of the Oregon Inlet channel may also cause temporary beach closures. Natural resource management of the past, present, and future including species research, and recovery plans may cause short to long-term and minor to major adverse impacts by requiring temporary, seasonal, or year round beach closures. Beneficial impacts come from past, present, and future actions by the National Park Service through continued following of the *Cape Hatteras National Seashore General Management Plan* (1984). The management plan puts visitor needs in consideration when managing seashore resources (NPS 2010). In addition continued maintenance on NC-12 and the Bonner Bridge would ensure the ability for the road to be useable in the future, creating long-term beneficial impacts to visitor use.

### **Conclusion**

The proposed developments under Alternative B would be constructed to facilitate appropriate user access based on the type of beach is a given location, ORV-open or ORV-closed. These developments were identified in the Off-Road Vehicle Management Plan/EIS to improve the impacts to visitor use as a result of beach closures to ORVs. As such, the projects outlined here would have long-term beneficial impacts to the visitor use and experience. In addition, as a result of cumulative events there may be short-term adverse impacts in the future but overall long-term impacts would be beneficial to the visitor use and experience in the Cape Hatteras National Seashore.

## **HUMAN HEALTH AND SAFETY**

### **Methodology and Assumptions**

The intensity of the potential effects on human health and safety was evaluated using the following system of impact thresholds:

**Negligible:** Human health and safety would not be affected; effects on employee and visitor health or safety would not be substantive or measurable.

**Minor:** Effects on employee and/or visitor health and safety would be detectable; however, they would not produce an appreciable change in human health or safety.

**Moderate:** The effects would be readily apparent, and would result in significant, noticeable effects on employee and/or visitor health and safety. Changes in rates or severity of injury or illness could be measured.

**Major:** The effects would be readily apparent, and would result in substantial, noticeable effects on staff and/or visitor health and safety, and could lead to staff or visitor mortality. Changes in rates or severity of injury or illness could be measured.

**Impact duration** is described as either short- or long-term. Short-term impacts would be recognized for less than one year. Long-term impacts would be recognized for more than one year.

**Study Area:** The study area for assessment of the proposed action and the no action alternative is the Seashore. The study area for the cumulative impact analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on Bodie Hatteras, and Ocracoke Islands.

## **Impacts of Alternative A, the No Action Alternative**

Under Alternative A, the current conditions at the 29 project locations would remain the same. Seashore visitors would use existing ORV ramps and roads, boardwalks, and foot paths in their existing conditions to access the beach. ORV routes not safely accessible to ORVs would remain closed. Current safety issues would remain the same. The potential for a public safety incident at these locations would continue to be present and would continue to result in long-term minor adverse impacts to public health and safety. Under this alternative no construction would occur, thus resulting in no impacts to construction crew.

### ***Cumulative Impacts***

Past, present and future actions have the potential to impact human health and safety. Past project, present, and future road improvements, and bridge improvements provide beneficial impacts to visitors of the Seashore. Construction crews performing this work would experience minor adverse impacts. Under this alternative, the cumulative Seashore-wide public health and safety conditions would be beneficial and short-term minor adverse.

### ***Conclusion***

Under Alternative A, the potential for safety incidents in the project area would continue and result in long-term minor adverse impact to public health and safety for ORV users, motorists, bicyclists, pedestrians, and users with restricted mobility. Overall, Alternative A would contribute a negligible increment to the short-term minor adverse and beneficial cumulative impact of the Seashore's public health and safety conditions.

## **Impacts of Alternative B, the NPS Preferred Alternative**

The proposed projects under Alternative B were selected facilitate safe visitor access to key recreational areas within the Seashore. ADA boardwalks would be added to potentially improve the safety for visitors with disabilities to access the Seashore who may be currently using unsafe access points. To safely accommodate disabled visitors, boardwalks would be built between four to ten feet wide with treated wood framing and support members with a composite wood deck material.

These construction projects would also enhance the safety of pedestrian access on the Seashore by providing increased parking capacity, preventing the need for potentially unsafe on street parking in some locations.

Because of the distance from established parking to popular Seashore areas, ORVs have long served as a primary form of access for many portions of the beach in the Seashore, and continue to be the most practical available means of access and parking for many visitors. More parking located near popular Seashore areas would potentially decrease the need for ORV use to the Seashore from established parking located beyond reasonable walking distance for visitors carrying equipment and visitors with

disabilities. This would reduce risk of ORV and pedestrian accidents. New and improved ORV access points would also potentially increase the safety of ORV users. Alternative B could result in short-term minor adverse impacts to construction crew due to the use of heavy machinery and long-term minor beneficial impacts to public health and safety could occur. OSHA regulations would be followed for worker safety. All handicap accessibility features would meet ADA standards.

### ***Cumulative Impacts***

Past, present and future actions have the potential to impact human health and safety. Past project, present, and future road improvements, and bridge improvements provide beneficial impacts to visitors of the Seashore. Construction crews performing this work would experience minor adverse impacts. Under this alternative, the cumulative Seashore-wide public health and safety conditions would be beneficial and short-term minor adverse. Alternative B would contribute a small beneficial increment to the cumulatively long-term beneficial impacts to health and safety.

### ***Conclusion***

Establishment of new parking areas, boardwalks, foot trails, road connectors, and additional and improved ORV and handicap ramps would result in long-term minor beneficial impact on public health and safety for ORV users, motorists, bicyclists, pedestrians, and users with restricted mobility in the project area. Alternative B would also result in short-term minor adverse impacts to construction crew. Overall, establishment of new parking areas, boardwalks, foot trails, road connectors, and additional and improved ORV and handicap contributes a noticeable, minor beneficial increment to the cumulative minor adverse impacts on public health and safety associated with past, present, and future actions.

## CHAPTER 5: CONSULTATION & COORDINATION

### SCOPING FOR THE EA

CEQ requires agencies to make “diligent” efforts to involve the interested and affected public in the NEPA process (40 CFR 1506.6), regardless of the level of impact or documentation. The extent of the public involvement will change depending on the degree of impact and interest in the proposal. Agencies must also “encourage and facilitate public involvement in decisions which affect the quality of the human environment” (40 CFR 1500.2 (d)). 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; and
- Define purpose and need, agency objectives and constraints, and the range of alternatives.

A project kickoff meeting and project site visit was conducted from January 10<sup>th</sup> to January 12<sup>th</sup>, 2012. The meeting was attended by several key Park staff members and provided an opportunity for scoping and further refinement of the proposed action and alternative.

Public scoping for the proposed action was first facilitated during the Draft ORVMP/EIS and interested individuals or government officials were given an opportunity to comment on the proposed developments listed in the ORVMP/EIS through the NPS Planning, Environment, and Public Comment website between March 12, 2010 and May 11, 2010.

A second opportunity to comment on the proposed developments listed in the ORVMP/EIS as well as on additional developments identified during internal scoping was provided through the NPS Planning, Environment, and Public Comment website. A brief project synopsis, including the proposed facilities and alternatives were posted on the website along with instructions for providing comments. The comment period extended from March 1 through March 31, 2012. 192 comments were received through the Planning, Environment, and Public comment website. A summary of the concern in those comments are outlined in Appendix A.

In addition to comments from the general public, comments were also received from the Southern Environmental Law Center and the Hatteras Island Genealogical and Preservation Society. Regardless of how a specific comment was submitted or received, all comments were given equal consideration in the scoping process. Important issues relevant to the proposed action were identified by input from the general public and agency officials.

Key issues included:

**Design concerns:** Several comments received indicated a desire for changes in a proposed project's design, including using pervious material and going up and over dunes.

**Additional amenities:** Several comments received indicated a desire for tire inflation stations, signs, and bathhouses near existing and proposed ramps, parking areas, or boardwalks.

**Priority:** Many comments received indicated a need for prioritizing the proposed projects. Many comments suggested how the proposed projects should be prioritized.

**Public Safety:** Several comments received were concerned about public safety issues with current conditions on the seashore. Other comments expressed concern about public safety from implementing the proposed projects and/or the design of the proposed projects.

**New Alternatives or Elements:** Many of the comments expressed the desire/need for expanding/increasing elements (parking areas, ADA accessible boardwalks, ORV ramps, or foot trails) to some of the projects or a desire/need for additional projects (Parking areas, ADA accessible boardwalks, ORVE ramps, or foot trails) on the National Seashore. In particular, comments were received expressing a need for the following project that was not identified in the ORVMP/EIS or during internal scoping: A relocation of soundside access north of access 53, which currently goes by Little Kinnakeet, to separate recreational users from the Little Kinnakeet visitors.

**Cost:** Several comments received expressed a concern about the cost of implementing and maintaining the projects on the National Seashore as well as charging permit fees before the projects are in place.

**Eliminating projects:** Several comments received indicated a desire for certain projects, elements of projects, or types of projects to be removed from the list of proposed projects because they did not see a need for these projects.

**Accessibility:** General comments the commenter wants the park to be aware of including handicap access issues and accessibility of sites.

**Visual Quality:** Several comments received indicated a concern that the natural beauty of the National Seashore would be impacted by implementing these projects.

**Sustainability:** Several comments were concerned with implementing the proposed projects when the coastal environment of the seashore is always changing.

**Wildlife Concerns:** Several comments were concerned about the impact these proposed projects would have on wildlife species within the park.

**Schedule:** Several comments requested a timeline for the proposed projects. Commenters want to know when the proposed projects will be implemented.

## **LIST OF RECIPIENTS OF THE EA**

North Carolina State Environmental Review Clearinghouse

- North Carolina Department of Environment and Natural Resources
    - Division of Coastal Management
    - Coastal Resources Commission
    - Division of Marine Fisheries
  - North Carolina Natural Heritage Program
  - North Carolina Department of Transportation
  - North Carolina State Historic Preservation Officer
  - North Carolina Wildlife Resources Commission
- 
- U.S. Army Corps of Engineers, Wilmington District
  - U.S. Fish and Wildlife Service, Ecological Services, Raleigh Field Office
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## CHAPTER 6: REFERENCES CITED

### Americans with Disabilities Act

2002 *Americans with Disabilities Act Accessibility Guidelines*

### American Bird Conservancy

2005 Emergency Petition for a Rule to List the Red Knot (*Calidris canutus rufa*) as Endangered under the Endangered Species Act, 16 USC 1531 et seq. (1973 as amended) within the United States. 44 pp.

### Council on Environmental Quality

1997 Environmental Justice, Guidance under the National Environmental Policy Act. Accessed March 3, 2011 at <http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf>.

### Cowardin, L.M, V. Carter, G.C. Golet, and E.T LaRoe

1979 Classification of Wetland and Deepwater Habitats of the United States. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C.

### Dare County

2003 Dare County Land Use Plan. July, 2003.

### Dolan, Robert, and Harry F. Lins

1986. The Outer Banks of North Carolina. USGS Professional Paper: 1177-B. Accessed May 2013 at <http://pubs.usgs.gov/pp/1177b/report.pdf>

### Federal Emergency Management Agency (FEMA).

n.d. MSC Product Map Search. Accessed May 2013:  
<http://gis1.msc.fema.gov/Website/newstore/viewer.htm>

### Federal Highway Administration (FHWA)

2007. Administrative Action: Supplement to the 2005 Supplemental Draft Environmental Impact Statement and Draft Section 4(f) Evaluation NC 12 Replacement of the Herbert C. Bonner Bridge.

### Fish and Wildlife Service

2012a Species by County Report; County: Dare, NC. Accessed November 2012 at [http://ecos.fws.gov/tess\\_public/countySearch!speciesByCountyReport.action?fips=37055](http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=37055).

2012b Species by County Report; County: Hyde, NC. Accessed November 2012 at [http://ecos.fws.gov/tess\\_public/countySearch!speciesByCountyReport.action?fips=37095](http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=37095).

### Hyde County

2006 Hyde County, North Carolina CAMA Core Land Use Plan.

### Intergovernmental Panel on Climate Change

2007 Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Core

Kidd, Stephen, National Park Service.

2013 Memorandum: Trip report on archeological testing of proposed beach access ramps, parking lots, and interdunal road.

Krings, A.

2012 Listed plant species survey for potential projects identified in the Cape Hatteras National Seashore Final Off-Road Vehicle Management Plan. Department of Plant Biology, North Carolina State University, Raleigh, NC.

National Park Service

No date Plants. Accessed May 2013: <http://www.nps.gov/caha/naturescience/plants.htm>

1979 Cape Hatteras National Seashore Environmental Analysis of Off-Road Vehicle Use with Alternatives. Prepared by Tony Barnes, Landscape Architect, Denver Service Center. August 1979.

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

2006a NPS Management Policies. Accessed May 2013 at <http://www.nps.gov/policy/mp2006.pdf>

2006b Cape Hatteras National Seashore Interim Protected Species Management Strategy/Environmental Assessment. January 18, 2006.

2006c Assessment of Coastal Water Resources and Watershed Conditions at Cape Hatteras National Seashore, North Carolina. Accessed May 2013 at [http://www.nature.nps.gov/water/nrca/assets/docs/caha\\_coastal.pdf](http://www.nature.nps.gov/water/nrca/assets/docs/caha_coastal.pdf)

2007a Strategic Plan for Cape Hatteras National Seashore October 1, 2006 – September 30, 2011.

2007b Cape Hatteras National Seashore Long-Range Interpretive Plan. September 2007.

2010 Final Cape Hatteras National Seashore Off-Road Vehicle Management Plan / Environmental Assessment. Accessed December 2011: <http://www.parkplanning.nps.gov/caha>.

2012a Cape Hatteras National Seashore 2011 Annual Park Visitation Report. Accessed December 2012: [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Visitation%20\(All%20Years\)?Park=CAHA](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Visitation%20(All%20Years)?Park=CAHA).

2012b Special Regulations, Areas of the National Park System, Cape Hatteras National Seashore Off-Road Vehicle Management Final Rule. Accessed December 2012: <http://www.parkplanning.nps.gov/caha>.

2012c Cape Hatteras National Seashore, North Carolina: Designated Off-Road Vehicle Routes (Map). Accessed May 2013 at <http://www.nps.gov/caha/planyourvisit/upload/02-10-12-ORV-Route-Map-FINAL-8-5x11.pdf>

2013 National Park Service Visitor Use Statistics. Accessed May 2013 at <https://irma.nps.gov/Stats/Reports/ReportList>

2013a United States Department of Interior, National Park Service. 2013. Cape Hatteras Animals. Accessed at: <http://www.nps.gov/caha/naturescience/animals.htm>.

2013b United States Department of Interior, National Park Service. March 1, 2013. Personal Communication, Species Lists. Randy Swilling, Natural Resource Program Manager. Cape Hatteras National Seashore.

North Carolina Department of Environment and Natural Resources, Division of Coastal Management. (NCDENR)

- 2010 GIS Data: Estuarine Shoreline-Coastal North Carolina. Accessed May 2012  
<http://dcm2.enr.state.nc.us/Maps/chdownload.htm>
- 2011 Long-Term Average Annual Erosion Rate. Accessed May 2012 at  
[http://dcm2.enr.state.nc.us/maps/erosion\\_rates\\_2011.htm](http://dcm2.enr.state.nc.us/maps/erosion_rates_2011.htm)
- 2012 GIS Data: Oceanfront Setback Factors. Access May 2012 at  
<http://dcm2.enr.state.nc.us/Maps/chdownload.htm>

North Carolina Department of Agriculture (NCDA)

- 2010 Web Map Service: 2010 Statewide Orthoimagery. Available at  
[http://imagery.nconemap.com/ArcGIS/rest/services/2010\\_Orthoimagery/ImageServer](http://imagery.nconemap.com/ArcGIS/rest/services/2010_Orthoimagery/ImageServer)

North Carolina Department of Crime Control and Public Safety (NCDCCPS)

- 2008 North Carolina Floodplain Management: 2008 Quick Guide. Accessed May 2013:  
<https://www.ncdps.gov/div/em/NFIP/NCQuickGuide2008.pdf>.

North Carolina Department of Transportation (NCDOT)

- 2008 NCDOT: Bonner Bridge. Accessed December 2012:  
<http://www.ncdot.org/projects/bonnerbridgerepairs/>

North Carolina Natural Heritage Program (NCNHP)

- 2013 North Carolina Natural Heritage Program. 2013. Natural Heritage Program List of the rare animal species of North Carolina 2012. Office of Conservation, Planning, & Community Affairs, N.C. Department of Environment and Natural Resources. Available at: [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=11871a9d-a0ca-48ad-a97d-58c17b15c70c&groupId=61587](http://portal.ncdenr.org/c/document_library/get_file?uuid=11871a9d-a0ca-48ad-a97d-58c17b15c70c&groupId=61587)

North Carolina Wildlife Resources Commission (NCWRC)

- 2005 North Carolina Wildlife Action Plan. Raleigh, NC.

Office of State Budget and Management, State Demographics Unit

- 2013 *County/State Population Projects*. Accessed April 30, 2013:  
[http://www.osbm.state.nc.us/ncosbm/facts\\_and\\_figures/socioeconomic\\_data/population\\_estimates/county\\_projections.shtm](http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/county_projections.shtm).

Outer Banks Scenic Byway Advisory Committee (OBSBAC)

- 2008 Corridor Management Plan for the Outer Banks Scenic Byway: Dare, Hyde, and Carteret Counties North Carolina.

Outer Banks Task Force (OBTf)

- 2007 "New Bonner Bridge Public Hearings Schedules with Focus on Two New Alternatives." Bonner Bridge Update Newsletter.  
[http://www.obtf.org/SpecialConcerns/BonnerBridge/pdf/February2007\\_NL.pdf](http://www.obtf.org/SpecialConcerns/BonnerBridge/pdf/February2007_NL.pdf)

Owens, C., District Planner, NCDENR

- 2010 Pers. comm. via email with D. Wetmore, The Louis Berger Group, regarding Dare County Land Use Plan. February 1, 2010.

Pendleton, E., R. Theiler, and J. Williams

- 2005 Coastal Vulnerability Assessment of Cape Hatteras National Seashore to Sea-Level Rise. Open-File Report 2004–1064. Accessed May 2013 at <http://pubs.usgs.gov/of/2004/1064/images/pdf/caha.pdf>
- Schafale, M.  
2012 Guide to the natural communities of North Carolina, fourth approximation. North Carolina Natural Heritage Program, Department of Environment and Natural Resources, Raleigh.
- Touchette, B.W., S. Schmitt, and J. Moody.  
2012 Wetland Delineation Report for New Development that Facilitates Public Access on Cape Hatteras National Seashore.
- United States Army Corps of Engineers  
2012a Nationwide Permit 19. Minor Discharges. Accessed May 2013: <http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/Permits/NationwidePermits.aspx>
- 2012b Nationwide Permit 46. Discharges in Ditches. Accessed May 2013: <http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/Permits/NationwidePermits.aspx>
- U.S. Fish and Wildlife Service, U.S. Department of the Interior (USFWS)  
2009 U.S. Fish and Wildlife Service, Branch of Habitat Assessment. 2009. *National Wetlands Inventory Data*. Accessed at <http://www.fws.gov/wetlands/Data/DataDownload.html>
- 2012a Species by County Report; County: Dare, NC. Accessed November 2012 at [http://ecos.fws.gov/tess\\_public/countySearch!speciesByCountyReport.action?fips=37055](http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=37055).
- 2012b Species by County Report; County: Hyde, NC. Accessed November 2012 at [http://ecos.fws.gov/tess\\_public/countySearch!speciesByCountyReport.action?fips=37095](http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=37095).
- United States Geological Survey  
2009 Earle Coastal Topography-Cape Hatteras National Seashore, North Carolina, Post-Nor'Ida, 2009: First Surface Mosaic: 5-meter resolution. Accessed May 2013 at [http://pubs.usgs.gov/ds/564/html/tile\\_htmls/mosaic\\_fs.html](http://pubs.usgs.gov/ds/564/html/tile_htmls/mosaic_fs.html)
- University of Idaho Park Studies Unit (UIPSU)  
2008 Cape Hatteras NS 2008 Visitor Survey Card Data Report. Accessed June 2013 at <http://www.psu.uidaho.edu/files/vsc/reports/vsc.CAHA708.pdf>
- University of Texas at Austin  
No Date. Webpage: Bureau of Economic Geology, Glossary. Accessed May 2013 at <http://www.beg.utexas.edu/UTopia/glossary.html>

## GLOSSARY

**Americans with Disabilities Act** - a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.

**Occupational Safety and Health Administration** - the main federal agency charged with the enforcement of safety and health legislation

**Coastal High Hazard Area (V Zone):** Special Flood Hazard Area that extends from offshore to the inland limit of a primary frontal dune along an open coast and other area subject to high velocity wave action. The area is designated on Flood Insurance Rate Maps as Zone VE.

**Endangered species**—“...any species (including subspecies or qualifying distinct population segment) that is in danger of extinction throughout all or a significant portion of its range (ESA Section 3(6)).” The lead federal agency, U.S. Fish and Wildlife Service, for the listing of a species as endangered is responsible for reviewing the status of the species on a five-year basis.

**Endangered Species Act (ESA) (16 USC 1531 et seq.)**—An act to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered species and threatened species.

**Erosion**—Removal of surface material from the earth’s crust, primarily soil and rock debris, and the transportation of the eroded materials by natural agencies from the point of removal.

**Estuarine:** Referring to the area where a sea tide meets a river current.

**Invasive Species** - An alien (nonnative to the ecosystem) species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

**Floodplain:** An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding

**Occupational Safety and Health Administration** - the main federal agency charged with the enforcement of safety and health legislation

**Overwash:** A mass of water representing the part of the wave advancing up a beach that runs over the highest part of the berm (or other structure) and that does not flow directly back to the sea or lake.

Nutrient loading: the total amount of nitrogen, phosphorus, or other nutrient entering the water during a given time

**Palustrine:** Marshes, swamps, bogs.

**Retrogradational:** The landward movement of a coastline over time.

**Storm Surge:** A rise above normal water level on the open coast due only to the action of wind stress on the water surface; includes the rise in level due to atmospheric pressure reduction as well as that due to wind stress.

**Washover:** Material deposited by overwash.

**Wetland:** Areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic soils and vegetation.

**Zone AE:** Flood Hazard Area that is subject to flooding by the base or 1% annual chance (100-year) flood, and waves less than 3 feet high.

**Zone VE:** Flood Hazard Area that is subject to wave highest 3 feet or more.