

BRITTA CY 4 | CAHA # 2029

Wetmore, Doug

From: Britta_Muiznieks@nps.gov
 Sent: Monday, November 16, 2009 2:45 PM
 To: Sandra_Hamilton@nps.gov; Mike_Murray@nps.gov; Fox, Lori; Wetmore, Doug
 Cc: Thayer_Broili@nps.gov
 Subject: Chapter 4 comments
 Attachments: Chapter 4_110609-revised bdm (comments through pg 100).doc

Sorry I am behind schedule getting my comments to you. I have reviewed the chapter up to page 100. I decided to send these out to you so you can start taking them into consideration as to whether you want to include them or not. Following are some general comments.

ML2 under alt C is very confusing to me and is described differently in different pages of the document.. The wording below may be a little different than what you have since it includes my revisions.

39

NO ORV corridor under Alt. C -

A On page 38 - Under ML2, once pre-nesting closures are implemented, a narrow ORV access corridor or pedestrian corridor could potentially be established.

B On page 39 - ML2 differs from ML1 in that it has the potential to establish a narrow access corridor open to ORVs where ORV use is permitted or the corridor could be open only to pedestrians, where ORV use is not permitted.

Upon the first observation of breeding activity, the standard buffers would apply, which depending upon the circumstance could close the access corridor.

C On page 41 - Regarding timing under alternative C, all SMAs are closed to ORVs 7 months per year and a pedestrian access corridor is established at Bodie Island Spit, Cape Point, and South Point Ocracoke on March 15 (subject to ML2 actions when breeding activity observed).

D On page 42 - Three areas of seasonal ORV use ~~at 3 SP SMAs~~ would be managed under ML2 procedures and would maintain an open pedestrian access corridor along the shoreline to the inlet or point, subject to resource closures.

E On page 49 - In three SMAs, under ML2 procedures, adjacent to the pre-nesting area NPS would provide an ORV corridor with a pass through zone at the start of the breeding season (March 15). When breeding activity is observed, standard buffers would apply, which depending upon the circumstances could close the access corridor until breeding activity has concluded.

Alt E →

Another clarification that Mike had asked me about last week is the difference between surveys and monitoring. At the Park we survey for turtle nests/crawls but monitor a nest for hatching. Surveys are usually conducted to determine presence/absence of nests. Monitoring is usually based on observations made at a specific location (ex. chick movements within the area, PIPL breeding activity) or changes over time (checking a chick/nest for normal development or hatching). I have changed surveying to surveys in my comments but that is only a personal preference.

Need to decide whether or not to capitalize "spit"-ex. Bodie Island spit or Bodie Island Spit.

The tables seem to emphasize similarities rather than differences between the alternatives. If we say impacts would be greater in alt X than impacts under alt Y, it should include what those are. If dates for closures are different, they should be included in the tables.

In this chapter, staff is generally referred to as Seashore staff and in the previous chapter it was Park staff. Need to decide one way or another and stick with it.

Turtle nest have closures, not buffers. A 30 foot buffer is different than a 30 foot closure.

Information will be available at visitor centers or at the ramps.... Information is available through a number of different outlets including the Park's website, Google Earth, Weekly Beach Access and Resource Management Reports. References to outreach could be beefed up a bit.

I prefer nesting season to breeding season for turtles since turtles don't breed on the seashore. In some instances we have to be careful about when we refer to night driving restrictions as being beneficial to sea turtles. The restrictions will benefit nesting turtles but won't always be in place to benefit the hatchlings as they emerge. Restrictions in different alternatives are lifted on different dates (August 31, September 15, and November 15).

Following are my comments through page100. Sorry it is taking me so long but it is a very slow process for me. You can either let me know when you are ready for the next set of comments or I can try to finish the entire document and send it to you then. I don't know what your timeline is other than I know it is short.

(See attached file: Chapter 4_110609-revised bdm (comments through pg 100).doc)

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BRITTA

Chf of - 2nd national

First 100p

CAHA # 2059

General

Park staff

vs

NPS staff

vs

Gas back

Too much description of

at this esp

in fire

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

1
2 This "Environmental Consequences" chapter analyzes both beneficial and adverse impacts that would
3 result from implementing any of the alternatives considered in this long-term ORV plan/EIS. This chapter
4 also includes a summary of laws and policies relevant to each impact topic, definitions of impact
5 thresholds (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the
6 analysis methods used for determining cumulative impacts. As required by the Council on Environmental
7 Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), a summary of
8 the environmental consequences for each alternative is provided in table 6, which can be found in
9 "Chapter 2: Alternatives." The resource topics presented in this chapter, and the organization of the
10 topics, correspond to the resource discussions contained in "Chapter 3: Affected Environment."

SUMMARY OF LAWS AND POLICIES

11
12 Three overarching environmental protection laws and their implementing policies guide the actions of the
13 NPS in the management of the parks and their resources—the Organic Act of 1916, NEPA and its
14 implementing regulations, and the Omnibus Management Act. For a complete discussion of these and
15 other guiding authorities, refer to the section titled "Related Laws, Policies, Plans, and Constraints" in
16 "Chapter 1: Purpose of and Need for Action." These guiding authorities are briefly described below.

17 The Organic Act of 1916 (16 USC 1), as amended and supplemented, commits the NPS to making
18 informed decisions that perpetuate the conservation and protection of park resources, leaving them
19 unimpaired for the benefit and enjoyment of future generations.

20 The National Environmental Policy Act of 1969 is implemented through regulations of the CEQ
21 (40 CFR 1500–1508). The NPS has, in turn, adopted procedures to comply with these requirements, as
22 found in Director's Order 12 (NPS 2001a) and its accompanying handbook.

23 The Omnibus Management Act (16 USC 5901 et seq.) underscores the NEPA provisions in that both acts
24 are fundamental to park management decisions. Both acts provide direction for connecting resource
25 management decisions to the analysis of impacts and communicating the impacts of those decisions to the
26 public, using appropriate technical and scientific information. Both acts also recognize that such data may
27 not be readily available, and they provide options for resource impact analysis should this be the case.

28 Section 4.5 of Director's Order 12 adds to this guidance by stating, "when it is not possible to modify
29 alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is
30 essential to making a well-reasoned decision, the National Park Service will follow the provisions of the
31 CEQ regulations (40 CFR 1502.22)." In summary, the NPS must state in an environmental assessment or
32 impact statement (1) whether such information is incomplete or unavailable; (2) the relevance of the
33 incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts
34 on the human environment; (3) a summary of existing credible scientific adverse impacts that is relevant
35 to evaluating the reasonably foreseeable significant adverse impacts; and (4) an evaluation of such
36 impacts based on theoretical approaches or research methods generally accepted in the scientific
37 community. Collectively, these guiding regulations provide a framework and process for evaluating the
38 impacts of the alternatives considered in this draft EIS.

1 **GENERAL METHODOLOGY FOR ESTABLISHING IMPACT**
 2 **THRESHOLDS AND MEASURING EFFECTS BY RESOURCE**

3 The following elements were used in the general approach for establishing impact thresholds and
 4 measuring the effects of the alternatives on each resource category:

- 5 • General analysis methods as described in guiding regulations, including the context and
 6 duration of environmental effects:
- 7 • Basic assumptions used to formulate the specific methods used in this analysis:
- 8 • Thresholds used to define the level of impact resulting from each alternative:
- 9 • Methods used to evaluate the cumulative impacts of each alternative in combination with
 10 unrelated factors or actions affecting park resources; and
- 11 • Methods and thresholds used to determine if impairment of specific resources would occur
 12 under any alternative.

13 These elements are described in the following sections.

14 **GENERAL ANALYSIS METHODS**

15 The analysis of impacts follows CEQ guidelines and Director's Order 12 procedures (NPS 2001a) and
 16 incorporates the best available scientific literature applicable to the region and setting, the resource
 17 evaluated, and the actions considered in the alternatives.

18 For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including
 19 assumptions and impact intensity thresholds.

20 **ASSUMPTIONS**

21 **Duration and Type of Impacts**

22 The following assumptions are used for all impact topics (the terms "impact" and "effect" are used
 23 interchangeably throughout this document):

- 24 • Short-term: Impacts are temporary (i.e., they occur for a matter of hours up to weeks at a time)
 25 without lasting effects. Examples include impacts from the ability of a visitor to access a certain
 26 area during a resource closure events.
- 27 • Long-term: Impacts are continuous throughout the life of the plan, with potentially permanent
 28 effects. Examples include ongoing impacts to park management and operations.
- 29 • Direct: Impacts would occur as a direct result of ORV management actions.
- 30 • Indirect: Impacts would occur from ORV management actions but would occur later in time or
 31 farther in distance from the action.

Cumulative Impacts

- 1 • Beneficial: A positive change in the condition or appearance of the resource or a change that
2 moves the resource toward a desired condition.
- 3 • Adverse: A change that moves the resource away from a desired condition or detracts from its
4 appearance or condition.

5 **Impact Thresholds**

6 Determining impact thresholds is a key component in applying NPS *Management Policies 2006* and
7 Director's Order 12. These thresholds provide the reader with an idea of the intensity of a given impact on
8 a specific topic. The impact threshold is determined primarily by comparing the effect to a relevant
9 standard based on applicable or relevant/appropriate regulations or guidance, scientific literature and
10 research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity
11 definitions are provided separately for each impact topic analyzed in this document. Intensity definitions
12 are provided throughout the analysis for negligible, minor, moderate, and major impacts. Except for the
13 threatened and endangered species topic, the impact thresholds are defined for adverse impacts, and
14 beneficial impacts are addressed qualitatively. For endangered and threatened species, both beneficial and
15 adverse impacts are qualified to facilitate Section 7 compliance.

16 **CUMULATIVE IMPACTS**

17 The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-
18 making process for federal projects. Cumulative impacts are defined as "the impact on the environment
19 which results from the incremental impact of the action when added to other past, present, and reasonably
20 foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such
21 other actions" (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the no
22 action alternatives.

23 Cumulative impacts were determined by combining the impacts of the alternative being considered with
24 other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other
25 ongoing or reasonably foreseeable future projects and plans at the Seashore and, if applicable, the
26 surrounding region. Table 42 summarizes the actions that could affect the various resources at the
27 Seashore. These actions are described in more detail in the "Related Policies, Laws, Plans, and Actions"
28 section of this document (see "Chapter 1: Purpose of and Need for Action"). Recreational use, past,
29 present, and future, is considered as an integral part of the action alternatives and is, therefore, not
30 addressed within the cumulative impact scenario.

31 The analysis of cumulative effects was accomplished using four steps:

- 32 Step 1—Resources Affected. Fully identify resources affected by any of the alternatives.
- 33 Step 2—Boundaries. Identify an appropriate spatial and temporal boundary for each resource.
- 34 Step 3—Cumulative Action Scenario. Determine which actions to include with each resource.
- 35 Step 4—Cumulative Impact Analysis. Summarize the cumulative impact of the proposed action
36 plus the other actions affecting the resource in question, defining context, intensity, duration and
37 timing; defining thresholds, methodology, etc.

1

TABLE 42. CUMULATIVE IMPACT SCENARIO

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Wetlands and Floodplains	Seashore Boundary, Plus Adjacent Non-NPS Lands On Bodie, Hatteras, and Ocracoke Islands	Oregon Inlet dredging Storms and Other Weather Events County Land Use Development Plan for Dare and Hyde Counties Hurricane Recovery Resource Management Plan Continued maintenance of NC-12 and berms Berm construction under the CCC and subsequent maintenance	Same as past actions	Same as present actions, plus NC-12 Improvements on Bodie Island Bonner Bridge Replacement
Federally listed Threatened, or Endangered Species	Specific to species as identified in USFWS Recovery Plans (piping plover, sea turtles) or based on habitat range (seabeach amaranth)	Oregon Inlet Dredging Storms and Other Weather Events County Land Use Development Plan for Dare and Hyde Counties Hurricane Recovery Resource Management Plan Continued Maintenance of NC-12 and Berms [If comment: Feel impact is overstated because no habitat in the area of NC-12, revise] Berm construction under the CCC and subsequent maintenance Long-range Interpretive Plan Previous ORV plans Concession Permits/Operations Species Research Efforts USFWS Species Recovery Plans Commercial Fishing	Same as past actions, plus Predator Management Plan (under development) Commercial Services Plan (under development)	Same as present actions, plus NC-12 Improvements on Bodie Island Bonner Bridge Replacement Development of Cape Lookout National Seashore ORV Management Plan/EIS Revision of the Cape Hatteras General Management Plan Revision of the Land Use Development Plan for Dare County
State-listed or Special Status Species	North Carolina populations	Same as Rare, Unique, Threatened, or Endangered Species	Same as Rare, Unique, Threatened, or Endangered Species	Same as Rare, Unique, Threatened, or Endangered Species

Comment [bdm1]: The maintenance of berms does affect PIPL, sea turtle and amaranth habitat.

Cumulative Impacts

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Wildlife and Wildlife Habitat (birds, invertebrates)	Seashore Boundary, plus adjacent non-NPS lands on Bodie, Hatteras, and Ocracoke Islands	Same as Rare, Unique, Threatened, or Endangered Species	Same as Rare, Unique, Threatened, or Endangered Species	Same as Rare, Unique, Threatened, or Endangered Species
Soundscapes	Seashore Boundary	Oregon Inlet Dredging Storms and Other Weather Events Berm construction under the CCC and subsequent maintenance	Same as past actions, plus: Increased vehicle traffic and village events Designation of Outer Banks Scenic Byway	Same as present actions, plus: Bonner Bridge Replacement NC-12 Improvements on Bodie Island Potential for military training operations, overflights
Visitor Use and Experience	Seashore Boundary	Oregon Inlet Dredging Storms and Other Weather Events Hurricane Recovery Resource Management Plan Continued Maintenance of NC-12 and Berms General Management Plan Long-Range Interpretive Plan Commercial Fishing	Same as past actions, plus: Predator Management Plan (under development) Designation of Outer Banks Scenic Byway	Same as present actions, plus: NC-12 Improvements on Bodie Island Bonner Bridge Replacement Development of Cape Lookout National Seashore ORV management plan/EIS Revision of the Cape Hatteras General Management Plan Revision of Land Use Development Plan for Dare County
Socioeconomic Resources Including Local Commercial Fishing Activities	Regional—Counties	Storms and Other Weather Events Commercial Fishing Continued Maintenance of NC-12 and Berms	Same as past actions, plus: Designation of Outer Banks Scenic Byway	Same as present actions, plus: Development of Cape Lookout National Seashore ORV management plan/EIS Revision of Land Use Development Plan for Dare County

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Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Seashore Management and Operations	All NPS facilities and lands managed by the Outer Banks Group	Oregon Inlet Dredging Storms and Other Weather Events Hurricane Recovery Resource Management Plan General Management Plan Long-range Interpretive Plan Commercial Fishing Continued Maintenance of NC-12 and Berms	Same as past actions, plus Ongoing Law Enforcement (note related to species or ORV management) Ongoing Research Studies Ongoing Maintenance Ongoing Surveying Predator Management Plan (under development)	Same as present actions, plus NC-12 Improvements on Bodie Island Revision of the General Management Plan Opening of Dune Road Around Cape Point

1 **IMPAIRMENT ANALYSIS METHOD**

2 Chapter 1 describes the related federal acts and policies regarding the prohibition against impairing park
 3 resources and values in units of the national park system. According to NPS *Management Policies 2006*,
 4 an action constitutes an impairment when an impact “would harm the integrity of park resources or
 5 values, including the opportunities that otherwise would be present for the enjoyment of those resources
 6 or values” (NPS 2006c, sec. 1.4.5). To determine impairment, the NPS must evaluate “the particular
 7 resources and values that would be affected; the severity, duration, and timing of the impact; the direct
 8 and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts”
 9 (NPS 2006c, sec. 1.4.5).

10 National park system units vary based on their enabling legislation, natural and cultural resources present,
 11 and park missions; likewise, the activities appropriate for each unit and for areas in each unit also vary.
 12 For example, an action appropriate in one unit could impair resources in another unit. Thus, this
 13 document analyzes the context, duration, and intensity of impacts of the alternatives, as well as the
 14 potential for resource impairment, as required by Director’s Order 12 (NPS 2001a). As stated in the NPS
 15 *Management Policies 2006* (NPS 2006c, sec. 1.4.5), an impact on any park resource or value may
 16 constitute an impairment, but an impact would be more likely to constitute an impairment to the extent
 17 that it affects a resource or value whose conservation is

- 18 • necessary to fulfill specific purposes identified in the establishing legislation or proclamation of
 19 the park;
- 20 • key to the natural or cultural integrity of the park; or
- 21 • identified as a goal in the park’s General Management Plan or other relevant NPS planning
 22 documents.

1 The following process was used to determine whether the various ORV management alternatives had the
2 potential to impair park resources and values:

- 3 • Step 1—The enabling legislation and the park’s General Management Plan were reviewed to
4 ascertain its purpose and significance, resource values, and resource management goals or
5 desired conditions.
- 6 • Step 2—Resource management goals were identified.
- 7 • Step 3—Thresholds were established for each resource of concern to determine the context,
8 intensity, and duration of impacts, as defined earlier in this chapter under “Impact Thresholds.”
- 9 • Step 4—An analysis was conducted to determine if the magnitude of impact would constitute
10 an “impairment,” as defined by NPS *Management Policies 2006* (NPS 2006c).

11 The impact analysis includes a determination of whether there would be an impairment of park
12 management resources for each of the management alternatives. Visitor use, park operations and
13 management, and the socioeconomic environment are not considered resources per se, although they are
14 dependent on the conservation of park resources. Impairment findings are not included as part of the
15 impact analysis for these topics.

16 WETLANDS AND FLOODPLAINS

17 GUIDING REGULATIONS AND POLICIES

18 Impacts on wetlands and floodplains are addressed under two federal executive orders: Executive Order
19 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management. NPS Director’s
20 Order 77-1 establishes policies, requirements, and standards for implementing Executive Order 11990 for
21 wetlands, while NPS Director’s Order 77-2 applies to all NPS-proposed actions that could adversely
22 affect the natural resources and functions of floodplains, including coastal floodplains, or increase flood
23 risks.

24 According to Director’s Order 77-1 and accompanying Procedural Manual 77-1, direct or indirect adverse
25 impacts on wetlands should be avoided, or where impacts cannot be avoided, degradation or loss must be
26 minimized by every practicable effort. The order adopts a “no net loss of wetlands” policy and states that
27 the NPS will use the Cowardin classification system as the standard for defining wetlands for purposes of
28 compliance with Executive Order 11990, which means that non-vegetated shorelines and mudflats are
29 included in the wetlands classification. Any NPS activities that involve the discharge of dredged or fill
30 materials into wetlands or “other waters of the United States” must also comply with the Clean Water Act
31 and Section 404 regulations (33 CFR 1344) and Section 10 of the Rivers and Harbors Act (33 CFR 403),
32 which prohibits the unauthorized obstruction or alteration of navigable waters of the United States.

33 If adverse impacts to wetlands would occur from a proposed project, a Statement of Findings is prepared,
34 unless the actions are exempted for the various reasons provided in Procedural Manual 77-1, Section
35 4.2(A). Exceptions may include actions designed for restoring wetlands and water dependent actions that
36 have minor impacts. As described more fully in the impact analysis, the rebuilding or expansion of any
37 parking areas or access roads under any action alternative would be limited to developed or non-wetland
38 areas, thereby avoiding impacts to wetlands. Indirect impacts may include minor effects from runoff to
39 nearby wetlands. Impacts related to the management or improvement of access for ORVs would not
40 require a Statement of Findings as long as new areas are not opened up for ORV use in wetland areas

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1 (Green and Noon 2008). although impacts related to this use are addressed in this section of the EIS. For
2 these reasons, a Statement of Findings for wetlands was not required for this project.

3 Director's Order 77-2 states that when it is not practicable to locate or relocate development or
4 inappropriate human activities to a site outside of and not affecting the floodplain, the NPS will prepare
5 and approve a Statement of Findings, in accordance with procedures described in Procedural Manual
6 77-2, Floodplain Management, and take all reasonable actions to minimize the impact to the natural
7 resources of floodplains. Because the study area is located entirely within a floodplain, and the action
8 alternatives include construction of additional hard-surface parking (or expansion of existing parking
9 areas) and access in the floodplain, the NPS prepared a Statement of Findings in accordance with
10 procedures described in Procedural Manual 77-2 (see appendix F for the Statement of Findings).

11 NPS *Management Policies 2006* also specifically address wetlands and floodplains in Sections 4.6.5 and
12 4.6.4, respectively. Section 4.6.5 refers to compliance with Executive Order 11990 and states that, when
13 practicable, the NPS will not simply protect but will also seek to enhance wetland values. For any
14 proposed new development or other activities that could adversely impact wetlands, the NPS will first
15 avoid impacts, then minimize impacts, and then compensate for impacts on at least a one-to-one basis.
16 Section 4.6.4 states that the NPS will protect, preserve, and restore the natural resource function of
17 floodplains, avoid the long- and short-term environmental effects associated with the occupancy and
18 modification of floodplains, and avoid floodplain development that could cause adverse impacts or flood
19 risks. According to Director's Order 77-2, a Statement of Findings is needed if there is no practical
20 alternative to locate development outside the floodplain.

21 ASSUMPTIONS, METHODOLOGY, AND IMPACT THRESHOLDS

22 To assess the magnitude of impacts to Seashore wetlands and floodplains under the various alternatives,
23 wetland types and floodplain boundaries were defined, identified, and mapped as needed for impact
24 analysis, based on the sources described in "Chapter 3: Affected Environment." The location and extent
25 of wetlands are shown on figure 34 (to be developed), with the extent of floodplains including the entire
26 seashore. Actions under each alternative were considered and impacts were assessed by examining the
27 types of uses and impacts that could occur in or near various wetlands or in floodplains, examining the
28 area that could be directly or indirectly affected by the proposed development of parking and access, and
29 assessing impacts on wetland and floodplain functions and values using best professional judgment, input
30 from NPS staff and EIS team members, and a review of relevant literature.

31 Figure Placeholder

32 **FIGURE 34. WETLANDS FIGURE PLACEHOLDER**

33 WETLANDS

34 Impact Thresholds

35 The impact thresholds for wetlands are based on the size, integrity, and connectivity of the wetlands
36 affected. These indicators are defined as follows:

37 **Size.** The severity of impacts to wetlands depends on the size of the wetland impacted. A small
38 area of impact in a large wetland would be likely to have less of an effect than a large area of
39 impact in a small wetland. The change in the size of a wetland, as a result of an impact, would also
40 influence the integrity and connectivity of the wetland.

Wetlands and Floodplains

1 **Integrity.** Highly intact wetland areas with little prior disturbance would be more susceptible to
 2 impacts from direct development than a wetland previously degraded by development or other
 3 activities. The loss of function and productivity of the higher quality wetland would be a greater
 4 loss than that of a lower quality wetland. Additionally, indirect impacts due to human trampling or
 5 a change in vegetation or hydrology would also impact the integrity of the wetland.

6 **Connectivity.** The relationship of wetlands to other wetlands or other valuable natural resources is
 7 also important in determining the degree of impact. Plant communities that are isolated from each
 8 other are less productive and functional than those that are connected. For example, narrow,
 9 previous trail corridors that are infrequently or seasonally used would have less fragmenting effect
 10 than would a wide hard-surface roadway with high volumes of vehicular or pedestrian traffic.
 11 Establishment of structures in wetland areas could also create barriers to the natural dispersal of
 12 plants and animals and impact the connectivity of wetlands.

13 A summary of wetland impacts under all alternatives is provided in table 43 at the end of this section. The
 14 following thresholds for evaluating impacts to wetlands were defined.

Negligible: No measurable or perceptible effects on size, integrity, or connectivity of wetlands would occur.

Minor: The effect on wetlands would be measurable or perceptible, but small in terms of area and the nature of the impact. A small effect on size, integrity, or connectivity would occur; however, the overall viability would not be affected. If left alone, an adversely affected wetland would recover, and the impact would be reversed.

Moderate: The impact would cause a measurable effect on one of the three wetlands indicators (size, integrity, connectivity) or would result in a permanent loss or gain in wetland acreage, but not to large areas. Wetland functions would not be affected in the long term.

Major: The impact would cause a measurable effect on all three wetlands indicators (size, integrity, connectivity) or a permanent loss or gain of large wetland areas. The impact would be substantial and highly noticeable. The character of the wetland would be changed so that the functions typically provided by the wetland would be substantially altered.

Duration: Short-term effects for vegetative wetlands: recovers in less than three years from any action taken.

Long-term effects for vegetative wetlands: takes longer than three years to recover, or effect is almost permanent.

Short-term effects for non-vegetated wetlands (shorelines): recovers within days to months.

Long-term effects for non-vegetated wetlands (shorelines): effects last longer than a few months.

Chapter 4: Environmental Consequences

1 **Study Area**

2 The study area for assessment of the various alternatives is the Seashore. The study area for the
 3 cumulative impacts analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on
 4 Bodie, Hatteras, and Ocracoke islands.

5 **Impacts Common to All Alternatives**

6 **Non-vegetated marine wetlands.** Non-vegetated marine intertidal wetlands are located at the
 7 Seashore between extreme high tide and extreme low tide. Each alternative provides for some
 8 ORV access (whether for surveying and management or recreational use) in varying areas of the
 9 Seashore according to where an ORV corridor is provided. The ORV corridor generally occurs
 10 approximately 150 feet landward of the average, normal high tide line, or if less than 150 feet of
 11 space is available, at the vegetation or the toe of the remnant dune line. This width may vary
 12 among alternatives, dependent on sensitive species location, but generally stays the same.

13 Impacts to wetland areas where ORVs are used include rutting and compaction of soils from ORV
 14 use by visitors or by staff during species management activities; however, due to the dynamic
 15 nature of the intertidal area, impacts would be expected to be short term, adverse, and negligible.
 16 These impacts would be short term due to the continuous movement and deposition of sand in the
 17 intertidal areas and the ability of the shoreline to “restore” itself in the long term. Due to the nature
 18 of the impacts and the consistent regeneration of wetland soils impacted by ORV use due to wave
 19 action, impacts on marine intertidal wetlands are not discussed in detail under each alternative
 20 below; rather, it was assumed that impacts from ORV driving to non-vegetated marine intertidal
 21 wetlands would be short-term, adverse, and negligible across all alternatives. The impact analysis
 22 therefore focuses on impacts to vegetated estuarine (soundside and interior) wetlands and
 23 addresses impacts to marine intertidal wetlands in the conclusions only.

24 Impacts to marine wetland habitats also affect invertebrate species that reside there, and are
 25 discussed in detail in the “Wildlife and Wildlife Habitat” section.

26 **Impacts of Alternative A: No Action—Continuation of Management under the Interim Protected**
 27 **Species Management Strategy**

28 Under alternative A, there would be no new construction of ramps or roads and, therefore, no direct
 29 adverse impacts to wetlands in the Seashore as a result of construction activities. The only other actions
 30 associated with this alternative that could result in wetland impacts would be impacts from the continued
 31 use of ORVs throughout the Seashore.

32 Under alternative A, Seashore staff would continue to survey for various species as identified in table 4,
 33 chapter 2. Seashore staff would use ATVs/UTVs and occasionally ORVs to conduct species surveys and
 34 to establish resource closures as required based on species behavior. There would be no impacts to
 35 estuarine wetlands, however, because species surveying and management would not typically occur in
 36 any areas where estuarine wetlands are located.

37 Under this alternative, visitors would be allowed to operate ORVs in all areas of the Seashore 24 hours
 38 per day year-round, subject to temporary resource closures, seasonal ORV closures in front of the
 39 villages, and temporary ORV safety closures (see figure 2, chapter 2, alternative A and B maps).
 40 Anecdotal evidence from park staff has demonstrated that some areas of estuarine wetlands at the
 41 Seashore have been denuded of vegetation from ORV use along the soundside shoreline. Studies at Cape
 42 Cod National Seashore also have noted the impacts from ORV use on vegetation (Broadhead and Godfrey

Wetlands and Floodplains

1 1977). Wetlands at the Seashore are also damaged when drivers attempt to avoid standing water on
 2 interior ORV routes and, instead, drive over vegetation while driving around these areas, as noted by park
 3 staff. This use has the potential to result in wider roads and crushed or dead wetland vegetation. Long-
 4 term, minor, adverse impacts to estuarine vegetated wetlands at the Seashore would continue to occur
 5 under alternative A, as ORV drivers would continue driving over wetland vegetation along the soundside
 6 shoreline and adjacent to interior ORV routes.

7 Overall, under alternative A, there would be short term, negligible adverse impacts to marine intertidal
 8 wetlands due to continued off-road vehicle use crossing these areas and long term minor adverse impacts
 9 to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound
 10 side.

11 **Cumulative Impacts.** Other past, present, and future planned actions within and around Cape Hatteras
 12 National Seashore have the potential to impact wetlands. The dredging of Oregon Inlet has occurred in
 13 the past and would continue to be conducted on an annual basis by the Corps. Material from the dredging
 14 of Oregon Inlet is used primarily for replenishment of Pea Island National Wildlife Refuge beaches.
 15 Because the dredged material is not deposited in vegetated wetlands, there should be no measurable
 16 impact to wetlands from this activity. However, the replacement of the Herbert C. Bonner Bridge is likely
 17 to adversely affect wetlands outside the NPS property because the preferred alternative for the bridge
 18 project would result in the filling and permanent loss of 3.1 acres of wetlands and open water habitat and
 19 would also involve temporary impacts to 12.5 acres of wetlands. To mitigate the permanent loss of
 20 3.1 acres of wetlands, the Corps would restore, create, or enhance wetlands at agency-approved ratios at
 21 locations to be determined. Potential compensatory wetland mitigation would include on-site restoration
 22 and enhancement of in-kind wetlands as compensation for as much of the permanently affected area as
 23 possible; however, the limited availability of potential mitigation sites in the immediate vicinity of the
 24 project area would necessitate an exploration of additional options, which include off-site restoration,
 25 creation, and enhancement of wetlands (FHWA 2007).

26 The final bridge alignment could result in the closure of ramp 4 and the construction of a new ramp 3 and
 27 associated parking north of Oregon Inlet Campground. However, there would be sufficient upland area in
 28 which to construct ramp 3 and any associated parking. Therefore, there would be no impacts to wetlands
 29 related to the construction of this new ramp and parking facilities. Because the bridge project would fill
 30 wetlands, it would have long-term impacts to wetlands, but mitigation would lessen these impacts. Other
 31 planned actions, such as construction of the Ocracoke Island multi-use trail and improvements slated for
 32 NC-12 on Bodie Island would not impact wetlands because there are no wetlands in the proposed project
 33 areas. The overall impacts of these past, current, and future actions on wetlands would be long term,
 34 minor to moderate, and adverse because construction would occur in wetland areas and would result in
 35 permanent wetland loss that would have a measurable effect on wetland indicators, but it would only
 36 impact 3.1 acres out of more than 1,000 acres of wetlands in the Bonner Bridge project area.

37 Local planning efforts and their policies toward development could also affect wetlands in the
 38 surrounding area. For example, the Hyde County Land Use Plan contains policy statements that indicate
 39 that the county will not adopt any local land use ordinances to regulate development in non-tidal
 40 wetlands. However, both Dare and Hyde counties recognize the importance of coastal wetlands, and these
 41 resources are protected as Areas of Environmental Concern (AECs) under the land use plans of both
 42 jurisdictions. In its 2003 Land Use Plan, Dare County recognizes the Buxton Woods forest as an example
 43 of one of the most unique maritime forests in North Carolina and establishes a special environmental
 44 zoning district (SED). SED-I generally allows only single-family residential development, provides limits
 45 on vegetation clearing and impervious cover, and establishes a 50-foot buffer from wetlands. Almost all
 46 the wetlands in the study area are coastal, so they would also be afforded protection as an AEC under
 47 North Carolina's Coastal Area Management Act (CAMA), which limits development in these areas to

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1 water-dependent uses only. Impacts to wetlands from potential new projects in Dare and Hyde counties,
 2 which would follow local planning policies, would be long-term and adverse, but only negligible as these
 3 policies would ensure that development in coastal wetlands is minimized.

4 The effects of the actions described above—when combined with the short- and long-term, negligible to
 5 minor, adverse impacts to wetlands under alternative A—would result in long-term, minor to moderate,
 6 adverse cumulative impacts on wetlands in the area of analysis.

7 **Conclusion.** There would be short- and long-term, negligible to minor, adverse impacts to wetlands
 8 resulting from the implementation of alternative A due to continued off-road vehicle use crossing marine
 9 intertidal wetland areas of the Seashore and direct damage to soundside wetlands from ORV use.
 10 Cumulative impacts to wetlands would be long-term, minor to moderate, and adverse. There would be no
 11 impairment of wetlands as a result of the implementation of alternative A.

12 **Impacts of Alternative B: No Action—Continuation of Management under Terms of the Consent**
 13 **Decree**

14 Under alternative B, there would be no new construction of ramps or roads and therefore no direct
 15 adverse impacts to Seashore wetlands as a result of construction activities. The only other actions
 16 associated with this alternative that could result in wetland impacts would be impacts from the continued
 17 use of ORVs throughout the Seashore, as described under methodology for this section.

18 Like alternative A, the Seashore staff would continue to survey for various species as identified in table 4,
 19 chapter 2. The Seashore staff would use ATVs/UTVs and occasionally ORVs to conduct species surveys
 20 and establish resource closures as required based on species behavior. There would be no impacts to
 21 estuarine wetlands, however, because species surveying and management would not typically occur in
 22 any areas where estuarine wetlands are located. The level of impact from species surveying and
 23 management practices would be the same under the management that occurred before the modification of
 24 the consent decree on June 2, 2009.

25 Recreational use and other activities under alternative B would be similar to alternative A, except for
 26 seasonal restrictions on night driving and increased resource protection buffer distances. Although ORV
 27 traffic would be restricted in certain areas of the Seashore due to temporary resource closures and
 28 eliminated seasonally during the evening hours due to night restrictions, there would still be ORV use in
 29 the intertidal areas and along the soundside, where damage to estuarine wetlands would continue during
 30 the day year-round and at nighttime from September 15 to April 30. Therefore, new restrictions on
 31 recreational ORV use under alternative B would not result in a measurable change in wetland impacts
 32 when compared to alternative A. Wetland impacts from recreational use under alternative B would be
 33 long-term, negligible to minor, and adverse.

34 Overall, under alternative B, there would be short term, negligible adverse impacts to marine intertidal
 35 wetlands due to continued off-road vehicle use crossing these areas and long term negligible to minor
 36 adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated
 37 wetlands on the sound side.

38 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
 39 cumulative impacts under alternative B would be identical to those under alternative A. The effects of
 40 these actions—when combined with the short- and long-term, negligible to minor, adverse impacts to
 41 wetlands under alternative B—would result in long-term, minor to moderate, adverse impacts on wetlands
 42 in the area of analysis.

1 **Conclusion.** There would be short- and long-term, negligible to minor, adverse impacts to wetlands
 2 resulting from the implementation of alternative B due to continued vehicle use on marine intertidal
 3 wetland areas of the Seashore and by direct damage to soundside wetlands caused by ORV use. Species
 4 surveying and management practices in use prior to the modification of the consent decree on June 2,
 5 2009, would not result in any change in the level of wetland impacts analyzed under this alternative.
 6 Cumulative wetland impacts would be long-term, minor to moderate, and adverse. There would be no
 7 impairment of wetlands as a result of the implementation of alternative B.

8 **Impacts of Alternative C: Seasonal Management**

9 Unlike the no-action alternatives, alternative C would involve the construction and relocation of ORV
 10 access ramps (with some additional ramps being added), the construction or expansion of public parking
 11 areas, and the establishment of a new interdunal road. In addition to the construction activities proposed
 12 under alternative C, species surveys for species presence or absence, and associated management
 13 activities, and the recreational use of ORVs could potentially impact wetlands within the Seashore.

14 Access for recreational use and other activities under alternative C would be similar to alternative A and
 15 B, except for the establishment of specific seasonal closures at the approximately 18 miles of Species
 16 Management Areas under alternative C. Under alternative C, the number of soundside access points
 17 would not change, but signs and protective fencing would be installed at the terminus of the soundside
 18 access points to reduce potential damage from vehicles to estuarine wetlands. Although alternative C
 19 includes additional measures for wetland protection on the soundside, long-term, negligible, adverse
 20 impacts to estuarine vegetated wetlands would occur due to the potential for ORVs driving over wetland
 21 vegetation along and adjacent to interior routes and access roads that lead to sound-side destinations.

22 Implementation of alternative C would involve the construction or relocation of six ORV access ramps,
 23 construction or expansion of nine public parking areas, and the establishment of one new interdunal road.
 24 All new access ramps and parking lots would be located exclusively in upland areas, thereby avoiding
 25 direct wetland impacts. Ramps would be surfaced with a semi-permeable clay/shell base, reducing runoff
 26 to any adjacent wetlands. New or expanded parking lots would be designed and constructed using
 27 environmentally sensitive standards to minimize stormwater runoff, including the use of natural or
 28 pervious materials when possible. The new interdunal road proposed under alternative C would extend
 29 from the existing interdunal road at ramp 45 to ramp 49 (see figure 2, chapter 2 alternative C maps).
 30 Wetland maps indicate there is a sufficient upland area to extend the interdunal road, while avoiding
 31 wetland areas. The interdunal road would be primitive in nature (for example, not paved or otherwise
 32 hardened) and would not require surfacing. Wetland impacts resulting from the extension of the
 33 interdunal road would be avoided, although heavy use of the road could result in inadvertent wetland
 34 damage if vehicles were to leave the road surface for any reason, as wetlands are immediately adjacent to
 35 this area. Construction activities under alternative C would avoid wetland areas and use materials and
 36 management practices that would reduce surface runoff, resulting in indirect, long-term, negligible,
 37 adverse impacts to wetlands.

38 Overall, under alternative C, there would be short term, negligible adverse impacts to marine intertidal
 39 wetlands due to continued off-road vehicle use crossing these areas and long term negligible adverse
 40 impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on
 41 the sound side. Construction activities under alternative C would avoid wetland areas resulting in indirect,
 42 long-term, negligible, adverse impacts to wetlands.

43 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
 44 cumulative impacts under alternative C would be identical to those under alternative A. The effects of
 45 these actions—when combined with the short- and long-term, negligible, adverse impacts to wetlands

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1 under alternative C—would result in long-term, minor to moderate, adverse impacts on wetlands in the
2 area of analysis.

3 **Conclusion.** There would be short- and long-term, negligible, adverse impacts to wetlands resulting from
4 the implementation of alternative C due to continued vehicle use on marine intertidal wetland areas and
5 the potential for damage to sound-side and interdunal wetlands caused by ORV use. Construction
6 activities under alternative C would avoid wetland areas and use materials and management practices that
7 would reduce surface runoff, resulting in long-term, negligible, adverse impacts to wetlands. Cumulative
8 impacts under alternative C would be long-term, minor to moderate, adverse impacts to wetlands in the
9 area of analysis. There would be no impairment of wetlands as a result of the implementation of
10 alternative C.

11 **Impacts of Alternative D: Increased Predictability and Simplified Management**

12 Alternative D would involve the construction or relocation of four ORV access ramps and the expansion
13 of one public parking area. In addition to the construction activities proposed under alternative D, species
14 surveying and management activities and the recreational use of ORVs could potentially impact wetlands
15 within the Seashore.

16 Vehicular access for recreational use and other activities under alternative D would be limited with the
17 year-round “vehicle free” designation of all points, spits, and village beaches (see figure 2, chapter 2,
18 alternative D maps). Soundside access would be managed the same as in alternative A, resulting in long-
19 term, negligible to minor, adverse impacts to estuarine vegetated wetlands.

20 The four proposed access ramps and parking lots would be located exclusively in upland areas—thereby
21 avoiding wetland impacts—as described under alternative C. Ramps and parking areas would be
22 constructed using environmentally sensitive standards to minimize stormwater runoff, as detailed in
23 alternative C. While the parking lots would not be located in wetlands, measures would be taken to ensure
24 that other wetlands in the area are not measurably impacted.

25 Overall, under alternative D, there would be short term, negligible adverse impacts to marine intertidal
26 wetlands due to continued off-road vehicle use crossing these areas and long term negligible to minor
27 adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated
28 wetlands on the sound side. Construction activities under alternative D would avoid wetland areas
29 resulting in indirect, long-term, negligible, adverse impacts to wetlands.

30 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
31 cumulative impacts under alternative D would be identical to those under alternative A. The effects of
32 these actions—when combined with the short- and long-term, negligible to minor, adverse impacts to
33 wetlands under alternative D—would result in long-term, minor to moderate, adverse impacts on
34 wetlands in the area of analysis.

35 **Conclusion.** There would be short- and long-term, negligible to minor, adverse impacts to wetlands
36 resulting from the implementation of alternative D due to continued vehicle use on marine intertidal
37 wetland areas, but predominantly due to the potential for damage to soundside wetlands caused by
38 continued ORV use in these areas. Construction activities under alternative D would avoid wetland areas
39 and use materials and management practices that would reduce surface runoff, resulting in indirect, long-
40 term, negligible, adverse impacts to wetlands. Cumulative impacts under alternative D would be long-
41 term, minor to moderate, adverse impacts to wetlands in the area of analysis. There would be no
42 impairment of wetlands as a result of the implementation of alternative D.

1 **Impacts of Alternative E: Variable Access and Maximum Management**

2 Alternative E would involve the construction and relocation of ORV access ramps, the construction or
 3 expansion of public parking areas, and the establishment of new interdunal roads and trails. In addition to
 4 the construction activities proposed under alternative E, Alternative E provides recreational access with a
 5 greater flexibility in accessing various areas of the Seashore through strategies such as improving the
 6 interdunal road system and providing ORV access corridors to selected ~~points and spits~~ and Cape Point.
 7 To protect soundside wetland resources, several soundside access areas would be closed and protective
 8 signage would be installed at those areas that remain open to vehicular use. Closing some of the
 9 soundside access points would reduce the potential for damage to estuarine wetlands from vehicles and
 10 provide beneficial impacts to wetlands in these areas. Although wetlands on the soundside would be given
 11 more protection under this alternative, long-term, negligible, adverse impacts to wetlands would occur in
 12 areas where ORV access continues due to the potential for ORVs driving over wetland vegetation
 13 adjacent to the extended interdunal road network.

14 Implementation of alternative E would involve the installation or relocation of 7 ORV access ramps,
 15 construction or expansion of 15 public parking areas, and the establishment of 1 new interdunal road and
 16 1 pedestrian trail. All new access ramps and parking lots would be located exclusively in upland areas,
 17 thereby avoiding impacts to wetlands, as described under alternative C. Ramps and parking areas would
 18 be constructed using environmentally sensitive standards to minimize stormwater runoff, as detailed in
 19 alternative C. The interdunal road under alternative E would extend from the existing interdunal road at
 20 ramp 45 to ramp 49. Wetland maps indicate that there is a sufficient upland area in which to extend the
 21 interdunal road, although there are adjacent wetland areas. Therefore, wetland impacts from the interdunal
 22 road extension would be avoided, although heavy use of the road could result in inadvertent wetland
 23 damage if vehicles were to leave the road surface for any reason, as park staff indicate currently occurs.
 24 The proposed pedestrian trail and interdunal road extension would not involve any formal surfacing or
 25 removal of vegetation and would avoid all wetland features. Construction activities under alternative E
 26 would avoid wetland areas and use materials and management practices that would reduce surface runoff,
 27 resulting in long-term, indirect, negligible, adverse impacts to wetlands.

28 Overall, under alternative E, there would be short term, negligible adverse impacts to marine intertidal
 29 wetlands due to continued off-road vehicle use crossing these areas and long term negligible adverse
 30 impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on
 31 the sound side. Construction activities under alternative E would avoid wetland areas resulting in indirect,
 32 long-term, negligible, adverse impacts to wetlands.

33 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
 34 cumulative impacts under alternative E would be identical to those under alternative A. The effects of
 35 these actions—when combined with the short- and long-term, negligible, adverse impacts to wetlands
 36 under alternative E—would result in long-term, minor to moderate, adverse impacts on wetlands in the
 37 area of analysis.

38 **Conclusion.** There would be short- and long-term, negligible, adverse impacts to wetlands resulting from
 39 the implementation of alternative E due to continued vehicle use on marine intertidal wetland areas and
 40 the potential for damage to interdunal wetlands caused by ORV use. Beneficial impacts would occur in
 41 soundside areas where ORV use is limited, and wetland areas would not be disturbed. Construction
 42 activities under alternative E would avoid wetland areas and use materials and management practices that
 43 would reduce surface runoff, resulting in long-term, negligible, adverse impacts to wetlands. Cumulative
 44 impacts under alternative E would be long-term, minor to moderate, and adverse. There would be no
 45 impairment of wetlands as a result of the implementation of alternative E.

1 **Impacts of Alternative F: Management Based on Advisory Committee Input**

2 Alternative F would involve the construction and relocation of ORV access ramps, the construction or
 3 expansion of public parking areas, and the establishment of new interdunal roads and trails. To protect
 4 soundside wetlands and vegetation under alternative F, protective signage would be installed at all
 5 soundside access points to reduce the potential for resource damage from ORV use, thereby resulting in a
 6 beneficial impact. However, two new soundside access points would be established, which could result in
 7 adverse impacts to estuarine wetlands. Although wetlands on the soundside would be given more
 8 protection through the installation of signage, long-term, negligible to minor, adverse impacts to wetlands
 9 would continue to occur due to the potential for ORVs driving over wetland vegetation along the
 10 extended interdunal road network and increased number of soundside access points.

11 Implementation of alternative F would involve the installation or relocation of 8 ORV access ramps,
 12 construction or expansion of 10 public parking areas, and the establishment of 3 new interdunal roads and
 13 1 pedestrian trail. All new access ramps and parking lots would be located exclusively in upland areas,
 14 thereby avoiding impacts to wetlands, as described under alternative C. Ramps and parking areas would
 15 be constructed using environmentally sensitive standards to minimize stormwater runoff, as detailed
 16 under alternative C. Under alternative F, new interdunal roads are proposed from ramp 45 to ramp 49, off
 17 of the Pole Road near Hatteras Inlet, and extending off of ramp 59 near North Ocracoke Spit. Wetland
 18 maps indicate that there is a sufficient upland area in which to develop these interdunal roads. Therefore,
 19 wetland impacts from the interdunal road extensions would be avoided, although heavy use of the roads
 20 could result in inadvertent wetland damage if vehicles were to leave the road surface for any reason. The
 21 proposed pedestrian trail and interdunal road extensions would not require any formal surfacing or
 22 removal of vegetation and would avoid all wetland features.

23 Overall, under alternative F, there would be short term, negligible adverse impacts to marine intertidal
 24 wetlands due to continued off-road vehicle use crossing these areas and long term negligible to minor
 25 adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated
 26 wetlands on the sound side. Construction activities under alternative F would avoid wetland areas
 27 resulting in indirect, long-term, negligible, adverse impacts to wetlands.

28 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
 29 cumulative impacts under alternative F would be identical to those described under alternative A. The
 30 effects of these actions—when combined with the short- and long-term, negligible to minor, adverse
 31 impacts to wetlands under alternative F—would result in long-term, minor to moderate, adverse impacts
 32 on wetlands in the area of analysis.

33 **Conclusion.** There would be short- and long-term, negligible to minor, adverse impacts to wetlands
 34 resulting from the implementation of alternative F, due to continued vehicle use on marine intertidal
 35 wetland areas, establishment of additional soundside access points, and the slight potential for damage to
 36 interdunal wetlands caused by ORV use adjacent to existing and proposed interdunal roads. Cumulative
 37 impacts under alternative F would be long-term, minor to moderate, and adverse. There would be no
 38 impairment of wetlands as a result of the implementation of alternative F.

Wetlands and Floodplains

TABLE 43. SUMMARY OF IMPACTS TO WETLANDS UNDER THE ALTERNATIVES

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Wetlands					
Under alternative A, there would be short term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term minor adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Cumulative impacts to wetlands would be long-term, minor to moderate, and adverse. There would be no impairment of wetlands as a result of the implementation of alternative A.	Under alternative B, there would be short term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term negligible to minor adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Cumulative wetland impacts would be long-term, minor to moderate, and adverse. There would be no impairment of wetlands as a result of the implementation of alternative B.	Under alternative C, there would be short-term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term negligible adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Construction activities under alternative C would avoid wetland areas resulting in indirect, long-term, negligible, adverse impacts to wetlands. Cumulative impacts under alternative C would be long-term, minor to moderate, adverse impacts to wetlands in the area of analysis. There would be no impairment of wetlands as a result of the implementation of alternative C.	Under alternative D, there would be short-term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term negligible to minor adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Construction activities under alternative D would avoid wetland areas resulting in indirect, long-term, negligible, adverse impacts to wetlands. Cumulative impacts under alternative D would be long-term, minor to moderate, adverse impacts to wetlands in the area of analysis. There would be no impairment of wetlands as a result of the implementation of alternative D.	Under alternative E, there would be short-term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term negligible adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Construction activities under alternative E would avoid wetland areas resulting in indirect, long-term, negligible, adverse impacts to wetlands. Cumulative impacts under alternative E would be long-term, minor to moderate, and adverse. There would be no impairment of wetlands as a result of the implementation of alternative E.	Under alternative F, there would be short-term, negligible adverse impacts to marine intertidal wetlands due to continued ORV use crossing these areas and long-term negligible to minor adverse impacts to estuarine wetlands due to direct damage from ORV use in and around vegetated wetlands on the sound side. Construction activities under alternative F would avoid wetland areas resulting in indirect, long-term, negligible, adverse impacts to wetlands. Cumulative impacts under alternative F would be long-term, minor to moderate, and adverse. There would be no impairment of wetlands as a result of the implementation of alternative F.

2 FLOODPLAINS

3 Assumptions

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

- 5 • FEMA Flood Insurance Rate Maps indicate the entire Seashore is within the 100-year
- 6 floodplain.
- 7 • The floodplains in the project area do not serve the same function (i.e., as a natural moderator of
- 8 floods) as floodplains in non-coastal areas because water levels in the project area are not
- 9 dependent on floodplain storage capacity. Rather the project area is subject to coastal flooding
- 10 caused by both hurricanes and other storm systems that can raise water levels substantially via
- 11 storm surge.

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1 **Impact Thresholds**

- 2 A summary of floodplains impacts under all alternatives is provided in table 44 at the end of this section.
 3 The following thresholds for evaluating impacts to floodplains were defined.

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

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

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

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

Duration: Short-term effects: the floodplain recovers in less than one year from any action taken.

Long-term effects: the floodplain takes longer than one year to recover or the effect is almost permanent.

4 **Study Area**

- 5 The study area for assessment of the various alternatives is the Seashore. The study area for the
 6 cumulative impacts analysis is the Seashore plus the adjacent lands outside of the Seashore boundaries on
 7 Bodie, Hatteras, and Ocracoke islands.

8 **Impacts of Alternative A: No Action—Continuation of Management under the Interim Protected
 9 Species Management Strategy**

- 10 Under alternative A, no construction is proposed. The management actions associated with alternative A
 11 (including the use of ORVs and ATVs/UTVs for recreation and species management activities) would not
 12 have a measurable effect on floodplains because driving on beach sand would not impact the natural
 13 function of the floodplain.

- 14 **Cumulative Impacts.** Because there would be no impacts on floodplain functions or values under the no-
 15 action alternative, no cumulative impacts would occur.

- 16 **Conclusion.** Implementation of alternative A would result in no impacts to the functions or values of the
 17 currently existing floodplains found within the study area. Because there would be no impacts on

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1 floodplain functions or values under the no-action alternative, no cumulative impacts would occur.
 2 Therefore, there would be no impairment of floodplain functions or values associated with alternative A.

3 **Impacts of Alternative B: No Action—Continuation of Management under Terms of the Consent**
 4 **Decree**

5 **Analysis.** No construction is proposed under alternative B. No management actions associated with
 6 alternative B (including the use of ORVs and ATVs/UTVs for recreation or species management
 7 activities) would have a measurable effect on floodplains as driving on beach sand would not impact the
 8 natural function of the floodplain. Management practices in use prior to the modification of the consent
 9 decree on June 2, 2009, would not result in any impacts to floodplains.

10 **Cumulative Impacts.** Because there would be no impacts on floodplain functions or values under
 11 alternative B, no cumulative impacts would occur.

12 **Conclusion.** Implementation of alternative B would result in no adverse, beneficial, or cumulative
 13 impacts on the functions or values of the currently existing floodplains found within the study area.
 14 Because there would be no impacts on floodplain functions or values under the no-action alternative, no
 15 cumulative impacts would occur. Therefore, there would be no impairment of floodplain functions or
 16 values associated with alternative B.

17 **Impacts of Alternative C: Seasonal Management**

18 The use of vehicles for species management and recreational access would not result in any impacts to
 19 floodplain functions or values, as described under the no-action alternatives. However, construction
 20 activities proposed under alternative C have the potential to impact the floodplain, as discussed below.

21 Alternative C would involve the construction or relocation of six ORV access ramps, construction or
 22 expansion of nine public parking areas, and the establishment of one new interdunal road, as shown on
 23 figure 2 in chapter 2. Because the entire Seashore is in the 100-year floodplain, no options for
 24 constructing the proposed facilities outside of the regulatory floodplain exist. Ramps would be surfaced
 25 with a natural semi-permeable clay/shell base, reducing stormwater runoff and limiting the potential for
 26 impacts to the floodplain's function. New or expanded parking lots would be designed and constructed
 27 using environmentally sensitive standards to minimize stormwater runoff, including the use of natural
 28 materials when possible. All of the parking lots would be located within the 100-year floodplain, with
 29 three lots in coastal high hazard areas subject to flash flooding. Construction of parking lots in these high
 30 hazard areas would be considered a Class III action requiring a Statement of Findings (see appendix F).
 31 Although Director's Order 77 allows the construction of day-use parking facilities within the 100-year
 32 floodplain in high hazard areas, signs informing visitors of flood risk and suggested actions in the event
 33 of flooding must be posted, and are included as part of alternative C. The interdunal road proposed under
 34 alternative C would extend from the existing interdunal road at ramp 45 to ramp 49. The road, constructed
 35 at grade, would not alter topography or require a finished surface, limiting the potential for impacts to
 36 floodplain function. The construction or expansion of the eight parking lots would result in the placement
 37 of approximately (x acres, square feet) of hardened surface in the 100-year floodplain and would have a
 38 limited effect on the ability of the floodplain to convey floodwaters from storm surge. Although impacts
 39 would result in a detectable change in floodplain functions and values, the change would be of little
 40 consequence and in nature. Therefore, impacts to floodplains associated with parking lot construction in
 41 alternative C would be long-term minor and adverse. [Preparer's Note: square footage to be inserted after
 42 SOF is completed.]

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1 **Cumulative Impacts.** Other past, present, and future planned actions within and around the Seashore
 2 have the potential to impact floodplains. The dredging of Oregon Inlet has occurred in the past and would
 3 continue to occur on an annual basis. Material from the dredging of Oregon Inlet is used for berm
 4 maintenance to protect NC-12, for the replenishment of Pea Island National Wildlife Refuge beaches, and
 5 for berm maintenance adjacent to the villages in the Seashore. The deposition of this material has the
 6 potential to impact the function of the floodplain in those areas if substantial changes to topography
 7 resulted in the diversion of floodwaters into developed or inhabited areas. The replacement of the Herbert
 8 C. Bonner Bridge is likely to affect floodplain because all of the replacement bridge corridor
 9 alternatives—as well as the existing Bonner Bridge and NC 12—are within the floodplain. However, the
 10 replacement bridge corridor alternatives should not have measurable impacts on floodplain values
 11 because the piles of the bridge substructure would not create backwater or adverse hydraulic conditions,
 12 and floodplain functions would not be expected to be impacted. All alternatives for the replacement of the
 13 Herbert C. Bonner Bridge conform to applicable state and local floodplain protection standards because
 14 they would not affect the storm surge elevation. However, the location of structures and impervious
 15 surfaces in the floodplain could result in localized flooding during heavy rain events. Other planned
 16 actions, such as construction of the Ocracoke Island multi-use trail and improvements slated for NC-12 on
 17 Bodie Island would contribute limited adverse impacts to floodplains because they would result in
 18 additional development or hardened surfaces in the floodplain that could impact the overall floodplain
 19 functions. The overall impacts of these past, current, and future actions on floodplains would be long-
 20 term, minor to moderate and adverse due to the development that would occur in the floodplain and the
 21 resulting potential to impact floodplain functions.

22 Local planning efforts and their policies toward development could also affect floodplains in the
 23 surrounding area. Both Dare and Hyde counties recognize the risks associated with floodplain
 24 development and support the administration and enforcement of all applicable floodplain management
 25 regulations and the National Flood Insurance Program. Almost all of the shoreline in the study area is in a
 26 high hazard flood area and would also be protected as an AEC under the North Carolina CAMA, which
 27 limits development in these areas. Impacts to floodplains from local planning policies would be long-term
 28 and beneficial because the local policies, along with existing federal regulations, would limit development
 29 in these areas.

30 The effects of the actions described above—when combined with the long-term, minor, adverse impacts
 31 to floodplains under alternative C—would result in long-term, minor, adverse impacts on floodplains in
 32 the area of analysis.

33 **Conclusion.** There would be long-term, minor, adverse impacts to floodplains resulting from the
 34 implementation of alternative C due to the construction or expansion of eight hard-surface parking lots
 35 within the 100-year floodplain. Installation of ORV access ramps would not impact floodplains because
 36 they would be composed of pervious materials. Interdunal roads would not be surfaced and would
 37 therefore not result in floodplain impacts. Past, present, and reasonable foreseeable future actions—when
 38 combined with the impacts of implementing alternative C—would result in long-term, minor, cumulative,
 39 adverse impacts to floodplains in the area of analysis. There would be no impairment of floodplains as a
 40 result of the implementation of alternative C.

41 **Impacts of Alternative D: Increased Predictability and Simplified Management**

42 The use of vehicles for species and management and recreational access would not result in any impacts
 43 to floodplain functions or values, as described under the no-action alternatives. However, construction
 44 activities proposed under alternative D have the potential to impact the floodplain, as discussed below.

Wetlands and Floodplains

1 Alternative D would require the least amount of construction of the action alternatives. Alternative D
 2 would involve the construction or relocation of four ORV access ramps and the expansion of one public
 3 parking area. Because the entire Seashore is within the floodplain, there would be no options for
 4 constructing the proposed facilities outside of the regulatory floodplain. The four ramps proposed under
 5 alternative D would be surfaced with a natural semi-permeable clay/shell base, thereby reducing
 6 stormwater runoff and limiting the potential for impacts to floodplain function. Under alternative D, the
 7 existing parking lot at the Ocracoke Day-Use Area would be expanded and would involve the placement
 8 of x square feet of new hardened surface in the 100-year floodplain. Although this area is not classified as
 9 a high-hazard area, the additional hardened surface would result in a change to floodplain function,
 10 although it would be imperceptible. There would be no additions or alterations to interdunal roads under
 11 alternative D. A Statement of Finding for floodplains would be prepared unless this parking lot was
 12 afforded an exception from Director's Order 77-2 procedures, which allow for the location of small
 13 parking facilities in the floodplain if they require little physical development and are not inhabited at
 14 night. Because construction activities under this alternative would involve the expansion of only one
 15 parking lot in the floodplain, impacts to floodplains associated with the implementation of alternative D
 16 would be long-term, negligible, and adverse.

17 **Cumulative Impacts.** Past, present, and reasonably foreseeable future actions that have the potential for
 18 cumulative impacts under alternative D would be identical to those under alternative A. The effects of
 19 these actions—when combined with the long-term, negligible, adverse impacts to floodplains under
 20 alternative D—would result in long-term, negligible to minor, adverse impacts to floodplain functions and
 21 values in the area of analysis.

22 **Conclusion.** There would be long-term, negligible, adverse impacts to floodplains resulting from the
 23 implementation of alternative D due to the expansion of the parking lot at the Ocracoke Day-Use Area.
 24 Past, present, and reasonable foreseeable future actions—when combined with the impacts of
 25 implementing alternative D—would result in long-term, negligible to minor, adverse cumulative impacts
 26 to floodplains in the area of analysis. There would be no impairment of floodplains as a result of the
 27 implementation of alternative D.

28 **Impacts of Alternative E: Variable Access and Maximum Management**

29 The use of vehicles for species management and recreational access would not result in any impacts to
 30 floodplain functions or values, as described under the no-action alternatives. However, construction
 31 activities proposed under alternative E have the potential to impact the floodplain, as discussed below.

32 Implementation of alternative E would involve the construction or relocation of 7 ORV access ramps,
 33 construction or expansion of 14 public parking areas, and the establishment of 1 new interdunal road and
 34 1 pedestrian trail. As discussed under alternative C, the establishment of ramps and extension of
 35 interdunal roads would not result in floodplain impacts because no impervious surfaces or above-grade
 36 structures would be constructed and floodplain functions would not be altered. The development of a
 37 pedestrian trail near Oregon Inlet under alternative E also would not result in floodplain impacts because
 38 the trail would be primitive in nature and would not be paved or surfaced. Impacts to floodplains
 39 associated with alternative E would arise from the construction of the proposed 14 new or expanded
 40 parking lots, several of which would be located in high hazard areas subject to coastal flooding.
 41 Construction of parking lots in these high hazard areas would be considered a Class III action requiring a
 42 Statement of Findings (see appendix F). Although Director's Order 77 allows the construction of day-use
 43 parking facilities within the 100-year floodplain in high hazard areas, these parking facilities must contain
 44 signs informing visitors of flood risk and suggested actions in the event of flooding, which would be
 45 included as part of alternative E.

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1 The construction or expansion of the parking facilities would require the placement of approximately (x
2 acres, square feet) of hardened surface in the 100-year floodplain and would impact the ability of the
3 floodplain to convey floodwaters from storm surge in these areas. Although impacts would result in a
4 detectable change in floodplain function, the change would not result in an appreciable increase in risk to
5 life or property. Therefore, impacts to floodplains associated with parking lot construction in alternative E
6 would be long-term, minor, and adverse.

7 **Cumulative Impacts.** Under alternative E, the same past, present, and planned future activities within the
8 Seashore that have the potential to affect floodplains would occur, and impacts would be the same as
9 described under alternatives C and D. The effects of these actions—when combined with the long-term,
10 minor, adverse impacts to floodplains under alternative E—would result in long-term, minor, adverse
11 impacts to floodplain functions and values in the area of analysis.

12 **Conclusion.** There would be long-term, minor, adverse impacts to floodplains resulting from the
13 implementation of alternative E due to the construction or expansion of 14 parking lots throughout the
14 Seashore. Past, present, and reasonable foreseeable future actions—when combined with the impacts of
15 implementing alternative E—would result in long-term, minor, adverse, cumulative impacts to
16 floodplains in the area of analysis. There would be no impairment of floodplains as a result of the
17 implementation of alternative E.

18 **Impacts of Alternative F: Management Based on Advisory Committee Input**

19 The use of vehicles for species and management and recreational access would not result in any impacts
20 to floodplain functions or values, as described under the no-action alternatives. However, construction
21 activities proposed under alternative F have the potential to impact the floodplain, as discussed below.

22 Implementation of alternative F would involve the construction or relocation of 8 new ORV access ramps,
23 construction of 10 new or expanded parking lots, and establishment of 3 new interdunal roads and a
24 pedestrian trail near Oregon Inlet. As discussed under alternative C, the establishment of ramps and
25 interdunal roads would not result in floodplain impacts because no impervious surfaces or above-grade
26 structures would be constructed, and floodplain functions would not be altered. The development of a
27 pedestrian trail near Oregon Inlet under alternative F would also not result in floodplain impacts because
28 the trail would be primitive in nature and would not be paved or surfaced in any way.

29 Impacts to floodplains associated with alternative F would arise from the construction or expansion of
30 parking lots, several of which would be located in high hazard areas subject to coastal flooding.
31 Construction of parking lots in these high hazard areas would be considered a Class III action requiring a
32 Statement of Findings (see appendix F). Although Director's Order 77 allows the construction of day-use
33 parking facilities within the 100-year floodplain in high hazard areas, these parking facilities must contain
34 signs informing visitors of flood risk and suggested actions in the event of flooding, which would be
35 included as part of alternative F. The construction or expansion of the 10 parking lots would require the
36 placement of approximately (x acres, square feet) of hardened surface in the 100-year floodplain and
37 would affect the ability of the floodplain to convey floodwaters from storm surge. Although impacts
38 would result in a detectable change in floodplain function, the change would be would not result in an
39 appreciable increase in risk to life or property. Therefore, impacts to floodplains associated with parking
40 lot construction in alternative F would be long-term, minor, and adverse.

41 **Cumulative Impacts.** Under alternative F, the same past, present, and planned future activities within the
42 Seashore that have the potential to affect floodplains would occur, and impacts would be the same as
43 described under alternatives C, D, and E. The effects of these actions—when combined with the long-

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1 term, minor, adverse impacts to floodplains under alternative F—would result in long-term, minor,
 2 adverse impacts to floodplain functions and values in the area of analysis.

3 **Conclusion.** There would be long-term, minor adverse impacts to floodplains resulting from the
 4 implementation of alternative F due to the construction or expansion of 10 parking lots throughout the
 5 Seashore. Past, present, and reasonable foreseeable future actions—when combined with the impacts of
 6 implementing alternative F—would result in long-term, minor, adverse, cumulative impacts to
 7 floodplains in the area of analysis. There would be no impairment of floodplains as a result of the
 8 implementation of alternative F.

9 **TABLE 44. SUMMARY OF IMPACTS TO FLOODPLAINS UNDER THE ALTERNATIVES**

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Floodplains					
Implementation of alternative A would result in no impacts to the functions or values of the currently existing floodplains found within the study area. No cumulative impacts would occur. There would be no impairment of floodplain functions or values associated with alternative A.	Implementation of alternative B would result in no impacts to the functions or values of the currently existing floodplains found within the study area. No cumulative impacts would occur. There would be no impairment of floodplain functions or values associated with alternative B.	There would be long-term, minor, adverse impacts to floodplains resulting from the implementation of alternative C due to the construction or expansion of eight hard-surface parking lots within the 100-year floodplain. Cumulative impacts to floodplains would be long-term, minor, and adverse. There would be no impairment of floodplains as a result of the implementation of alternative C.	There would be long-term, negligible, adverse impacts to floodplains resulting from the implementation of alternative D due to the expansion of one parking lot. Cumulative impacts to floodplains would be long-term, negligible to minor, and adverse. There would be no impairment of floodplains as a result of the implementation of alternative D.	There would be long-term, minor, adverse impacts to floodplains due to the construction of 14 parking lots under alternative E. Cumulative impacts to floodplains would be long-term, minor, and adverse. There would be no impairment of floodplains as a result of the implementation of alternative E.	There would be long-term, minor, adverse impacts to floodplains due to the construction of 10 parking lots under alternative F. Cumulative impacts to floodplains would be long-term, minor, and adverse. There would be no impairment of floodplains as a result of the implementation of alternative F.

10 **FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES**

11 **GUIDING REGULATIONS AND POLICIES**

12 The Endangered Species Act (16 USC 1531 et seq.) mandates that all federal agencies consider the
 13 potential effects of their actions on species listed as threatened or endangered. If the NPS determines that
 14 an action may affect a federally listed species, consultation with the USFWS is required to ensure that the
 15 action would not jeopardize the species' continued existence or result in the destruction or adverse
 16 modification of critical habitat. NPS *Management Policies 2006* state that the NPS will survey for,
 17 protect, and strive to recover all species native to NPS units that are listed under the ESA, and proactively
 18 conserve listed species and prevent detrimental effects on these species (NPS 2006c, sec. 4.4.2.3). NPS
 19 *Management Policies 2006* also state that “[the NPS will] manage state and locally listed species in a
 20 manner similar to its treatment of federally listed species to the greatest extent possible” (NPS 2006c, sec.
 21 4.4.2.3).

Chapter 4: Environmental Consequences

1 ASSUMPTIONS, METHODOLOGY, AND IMPACT THRESHOLDS

2 The following information was used to assess impacts on all listed species from ORV management
3 actions:

4 | 1. ~~s~~ ~~which species are found in areas likely to be affected by actions described in the~~
5 | ~~alternatives:~~

6 | 2. habitat loss or alteration caused by the alternatives; and

7 | 3. displacement and disturbance potential of the actions and the species' potential to be affected by
8 | the activities.

9 According to the ESA, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap,
10 capture, or collect, or to attempt to engage in any such conduct.

11 Specific methodologies and assumptions pertaining to the piping plover, sea turtles, or seabeach amaranth
12 are described under the relevant descriptions in the following text.

13 When examining the impacts of artificial light on threatened and endangered species (primarily sea
14 turtles), the lighting zones developed for Cape Hatteras National Seashore by the NPS Night Skies Team
15 were considered. In these zones, special consideration is given to areas with sensitive wildlife and
16 alternate guidance is provided to enhance the protection of nocturnal habitat. These special lighting zones
17 represent the conditions that should be present at the Seashore, not necessarily actual current conditions,
18 and create a buffer when two varying zones abut each other.

19 The following assumption was made regarding the analysis for all alternatives:

20 An indirect impact from recreation use is the attraction of mammalian and bird predators to trash
21 associated with recreation use (USFWS 1996a). Predation continues to be a major factor affecting
22 the reproductive success of piping plovers (Elliot-Smith and Haig 2004). The Seashore would
23 enforce proper trash disposal and anti-wildlife feeding regulations to reduce the attraction of
24 predators to the area under all alternatives. Nevertheless, as demonstrated by the Seashore's
25 annual plover reports, predation continues to be a threat to piping plover success at the Seashore
26 (see "Chapter 3: Affected Environment"). Recreational use that brings humans into areas where
27 plovers reside would continue to have indirect impacts by attracting ~~mammalian~~ predators,
28 resulting in long-term, moderate impacts under all alternatives as impacts could be detectable and
29 outside the range of natural variability, but would not result in large declines in population as the
30 Seashore takes steps to protect listed species from predation.

Comment [bdm2]: I deleted
mammalian because avian predation is
also a problem.

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1 The ESA defines the terminology used to assess impacts to the piping plover, sea turtles, and seabeach
2 amaranth as follows.

No effect: When a proposed action would not affect a listed species or designated critical habitat.

May affect / not likely to adversely affect: When effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where "take" occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

May affect / likely to adversely affect: When any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, then it "is likely to adversely affect" the species. Incidental take is the take of a listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity.

Is likely to jeopardize species / adversely modify critical habitat: The appropriate conclusion when the NPS or the USFWS identifies an adverse effect that could jeopardize the continued existence of a species or destroy or adversely modify critical habitat of a species within or outside park boundaries.

3 The EIS will serve as the biological assessment in compliance with Section 7 consultation requirements
4 and analyzes impacts using the above terminology. Each alternative includes an ESA summary after the
5 conclusion section to facilitate this compliance. To provide the public with additional information on the
6 intensity of impacts, the NEPA thresholds for each species were defined and used throughout the analysis.

7 Study Area

8 The study area for assessment of the various species is described separately for each listed species.

9 PIPING PLOVER

10 Species-Specific Methodology and Assumptions

11 Potential impacts on the federally threatened piping plover populations and habitat were evaluated based
12 on available data on the species' past and present occurrence at Cape Hatteras National Seashore.
13 scientific literature on the species, life history, scientific studies on the impacts of human disturbance on
14 piping plovers, as well as documentation of the species' association with humans, pets, predators, and
15 ORVs. Information on habitat and other existing data were acquired from staff at Cape Hatteras National
16 Seashore, the USFWS, and available literature.

Chapter 4: Environmental Consequences

1 **Piping Plover Impact Thresholds**

2 A summary of piping plover impacts under all alternatives is provided in table 45 at the end of this
3 section.

4 The following thresholds for evaluating impacts to piping plovers were defined.

Negligible: There would be no observable or measurable impacts to piping plovers, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.

Minor Adverse: Impacts on piping plovers would be detectable, but would not be outside the natural range of variability. Occasional responses by some individuals to disturbance could be expected, and may result in minimal interference to feeding, reproduction, resting, or other factors affecting population levels, but would not be expected to result in changes to local population numbers, population structure, and other demographic factors. Some indirect impacts might occur during critical reproduction periods for piping plover, but would not result in injury or mortality. Sufficient habitat in the park would remain functional to maintain a sustainable population in the Seashore.

Minor Beneficial: Impacts on piping plover, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Improvements to key characteristics of habitat and/or protection to key life history stages in the park would sustain or slightly improve existing population levels, population structure, or other factors and maintain a sustainable population in the Seashore.

Moderate Adverse: Impacts on piping plover, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses by some individuals to disturbance could be expected, with some negative impacts to feeding, reproduction, resting, or other factors affecting local population levels. Small changes to local population numbers, population structure, and other demographic factors may occur. Some impacts might occur during critical periods of reproduction or in key habitats in the park and result in harassment, injury, or mortality to one or more individuals. However, sufficient population numbers and habitat in the park would remain functional to maintain a sustainable population in the Seashore.

Moderate Beneficial: Impacts on piping plover, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Changes to key characteristics of habitat in the park and/or protection to key life history stages would minimize or prevent harassment or injury to individuals and improve the sustainability of the species in the Seashore.

Comment [bdm3]: If there was a direct impact that occurred during the critical reproduction period then it would not be considered minor adverse.

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Major Adverse: Impacts on piping plover, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability. Frequent responses by some individuals to disturbance would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in park population levels or a failure to restore levels that are needed to maintain a sustainable population in the Seashore. Impacts would occur during critical periods of reproduction or in key habitats in the park and result in direct mortality or loss of habitat. Local population numbers, population structure, and other demographic factors might experience large declines.

Major Beneficial: Impacts on piping plover, their habitats in the park, or the natural processes sustaining them during key life history stages would be detectable, would be expected to be outside the natural range of variability. Changes to key characteristics of habitat in the park and/or protection to key life history stages would substantially lessen mortality or loss of habitat and would result in notable increases in Seashore population levels.

Duration: Short-term effects could be a one time event or an event occurring for up to would be one to two breeding seasons for piping plover.

Long-term effects would be anything beyond two breeding seasons for piping plover.

Comment [bdm4]: Couldn't a short term effect be a one time event?

1 Study Area

2 The study area for assessment of the various alternatives is the Seashore. The study area for the
3 cumulative impacts analysis is the Seashore and regionally, including the Carolina area included in the
4 recovery plan for the piping plover (USFWS 1996a).

Comment [bdm5]: Recommend replacing regionally with "the Atlantic Coast population as a whole". Would the citation still stand?

change cum impacts if use whole pop?

5 Impacts of Alternative A: No Action—Continuation of Management under the Interim Protected
6 Species Management Strategy

7 Resource Management Activities. Under alternative A, piping plover surveying would occur at the
8 inlets, Cape Point and South Beach once a week from March 15 to March 31, and increase to three times a
9 week from April 1 to June 15. When nests are located, surveying would further increase to once daily.

Comment [bdm6]: Elsewhere referred to as spits? If this is how it is referred to in the Interim Plan then OK to leave as is.

10 Establishment of Pre-Nesting Closures. Pre-nesting closure areas would be established in areas used by
11 piping plover during the past three breeding seasons (defined as "recent breeding" habitat) with symbolic
12 fencing to minimize human disturbance. An annual habitat assessment would be conducted in February or
13 March. Based on this assessment, new habitat and suitable portions of recent breeding habitat, such as
14 some shoreline foraging areas and nesting habitat, would be closed to the public with symbolic fencing by
15 April 1 each year. This annual habitat assessment would include Bodie Island Spit, Cape Point, South
16 Beach, and Hatteras Spit, North Ocracoke, and South Ocracoke. Alternative A would provide protection
17 at recent breeding sites used within the past three years, closing portions of them to access by April 1, but
18 would not post habitat not used prior to last three years or new suitable habitat. This could cause adverse
19 impacts, because any piping plovers attempting to use these unprotected areas in the early spring (prior to
20 April 1) may abandon their attempts due to human disturbance (e.g., vehicles, pedestrians, kites) prior to
21 being detected by bi-weekly surveys. Under alternative A, piping plovers would likely benefit from
22 surveying and resultant closures in the pre-nesting phase, however since closures are not established until
23 April 1, individuals nesting prior to that would not benefit from these closures and would receive

Comment [bdm7]: Is this taken straight from the Interim Plan? If it is then OK otherwise need to be consistent with what we call this area-South Point vs South Ocracoke vs Ocracoke South Point

Comment [bdm8]: Line 7 says we will survey once a week from March 15-March 31.

Starts April 1

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1 protection only if found during surveying (see below). As early nesting piping plover would not be
 2 afforded protection from pre-nesting closures, there would be long-term minor to moderate adverse
 3 impacts, since there may be impacts during critical periods of reproduction. Once the pre-nesting
 4 closures are in place, long-term moderate beneficial impacts would occur for piping plover at the
 5 Seashore.

6 *Surveying and Monitoring.* Beginning March 15 staff would survey recent piping plover breeding areas
 7 once a week and beginning April 1, staff would survey recent piping plover breeding areas three times per
 8 week. A range of observations as required by the USFWS Amended Biological Opinion (USFWS 2007a)
 9 (outlined in table 1 of the FONSI), would occur for each bird species by qualified staff across all life
 10 stages. Staff would observe species activities and potentially close areas, outside of defined pre-nesting
 11 closures, being used by piping plovers or other protected bird species. Closures would be removed if no
 12 bird activity is seen by July 15 or when the area has been abandoned for a 2-week period, whichever
 13 comes later. When piping plover nests are found in existing or newly established closure areas, ~~Seashore~~
 14 ~~Park~~ staff would collect a variety of data including number of observations of plovers performing
 15 territorial defense or courtship outside symbolic fencing; number of observations of plovers making nest
 16 scrapes outside the symbolic fencing; and the number of vehicles, pedestrians, or pets within the symbolic
 17 fencing and/or in which tracks are observed crossing into posted habitat. Although surveying would bring
 18 people and/or essential vehicles into direct, short-term contact with piping plovers and their habitat, and
 19 these activities themselves are a known risk factor, implementing precautions to minimize impacts, for
 20 example, using scopes to watch the birds from a distance and remaining outside closures to the extent
 21 possible, and the protection that results from surveying may result in long-term, minor to moderate,
 22 beneficial impacts.

23 *Buffer/Closure Establishment.* Under alternative A, outside of pre-nesting closures, if courtships or
 24 copulations are observed for two consecutive survey days, a buffer would be established, or expanded, to
 25 ensure a 150-foot buffer for the observed birds. When nesting occurs, a 150-foot buffer/closure would be
 26 established around piping plover nests outside existing closures. These closures would be expanded, if
 27 necessary, to prevent disturbance, using flexible increments dependent on observed bird behavior. When
 28 resource closures are created around nests, the ORV corridor would be adjusted whenever possible to
 29 allow for vehicle passage, and the width of this corridor would be reduced if necessary. Closures could
 30 also be expanded if adults are observed foraging outside of a closure on two consecutive surveys and in
 31 this case, the buffer would be expanded to include the foraging site. For unfledged chicks, alternative A
 32 would establish a minimum 600-foot buffer ~~would be established on either side of the brood~~ based on
 33 observation of bird behavior and terrain conditions ~~at the site~~. Chicks would be observed continuously
 34 during daylight hours during the first week. Based on observed behavior, ~~the~~ buffer area may require
 35 expansion up to 3,000 feet if chicks are highly mobile. Based on observed behavior (i.e., mobility of the
 36 brood) and the capability to continually observe mobility and behavior, the buffer zone could be reduced
 37 after the first week to no less than 300 feet, but might require expansion up to 3,000 feet if chicks are
 38 subsequently observed to exhibit high mobility. After the first week, if the closure is reduced or remains
 39 the same, continuous observation would continue and if the closure is enlarged, observations would be
 40 reduced to once daily. Therefore, buffers would move with chicks and thereby provide them with more
 41 protection than non-moving buffers. Bypass routes would be closed at night if the buffer zone is less than
 42 600 feet.

43 When closures are created around broods, the ORV corridor would be adjusted whenever possible to
 44 allow vehicle passage. ~~In areas~~ Areas in which the buffer zone eliminates the ORV corridor, alternate
 45 ORV routes would be identified if available. If there are no alternate ORV routes, a bypass would be
 46 established if possible. Under alternative A, beaches would be closed to recreational access down to the
 47 waterline, if necessary, to allow chicks access to foraging areas, thereby providing chicks with maximum
 48 protection during this sensitive life stage. Under this type of management, staff would observe piping

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1 plover chicks from a distance to minimize disturbing the birds and allow the birds to forage or rest as they
2 would under undisturbed conditions.

3 Alternative A provides for protection of piping plover nests through the use of buffer distances
4 recommended in the piping plover recovery plan (USFWS 1996a). Further, additional information would
5 be collected during this life stage from daily observations via use of optical equipment outside the
6 symbolic fencing and from close approaches to nests once per week to observe and record data. Staff
7 observing bird location and behavior would have the flexibility to adjust closure buffers, as some
8 individual piping plovers might require larger buffers than others (USFWS 1996a). Adverse impacts
9 could result to piping plovers if adjustments to the buffer are not made in a timely manner or if nests are
10 missed by observers. Except for the once per week nest examination, the buffers under alternative A
11 would be expected to have long-term minor to moderate beneficial effects on the species as park
12 personnel and recreationists who respect resource closures would be kept a safe distance (at least 150
13 feet) from incubating adults and their nests.

14 Piping plovers would likely experience minor long-term benefits from the size of resource closures and
15 observation intensity would adjust in response to chick behavior, which would be especially responsive to
16 highly mobile broods. However, basing buffer size on chick behavior and adjusting these buffers as
17 necessary may also result in long-term moderate adverse impacts as frequent adjustment of the buffers
18 may result in additional disturbance to piping plover, and buffers that are not adjusted in a timely manner
19 could result in less than optimal protection for the species.

20 *Management of Wintering/Non-breeding Populations.* As provided in the USFWS Amended Biological
21 Opinion (USFWS 2007a), the NPS would monitor the presence, abundance, and behavior of migrating
22 and wintering piping plovers from August 1 to March 31 of each year. During surveys, specific
23 observations would be made regarding vehicle, pedestrian, and pet tracks in posted habitat; signs of
24 predators, including species; specific management measures in place at the time of the observation;
25 observed behaviors; and reactions to disturbance by pedestrians, pets, or vehicles. Data collected would
26 result in minor to moderate beneficial impacts to plovers by providing park managers with information
27 on the types and locations of habitats used, by non-breeding piping plovers, seasonality of plover use of
28 the Seashores, and times of day used tidal influences on habitat use, and the locations of those habitats, as
29 well as and potential threats the habitat may contain. Surveying would increase knowledge on how and
30 when piping plovers use the park and enable adaptive management initiatives.

31 Suitable interior habitats at spits and at Cape Point would be closed year-round to all recreational
32 users ORVs and would provide for resting and foraging for all species, resulting in long-term minor
33 beneficial impacts as this would represent an improvement to habitat prevent degradation/disturbance of
34 habitat during key life stages of the species. Suitable habitats would typically include ephemeral ponds
35 and moist flats at Cape Point, Hatteras Spit, Ocracoke, and Bodie Island Spit. Actual locations of suitable
36 foraging and resting habitat would change periodically due to natural processes such as tides and storms.

37 *Education/Public Outreach.* Under alternative A, the public would continue to receive information at the
38 visitor centers about piping plovers and their ecology and the measures the park is taking to protect the
39 species. The public would also continue to be notified about closures that would limit ORV or pedestrian
40 traffic, as well as when these closures reopen. Such public outreach is beneficial to the species as it
41 educates the public to the specific needs of the species and alerts the public ahead of time to areas where
42 they cannot go due to potential impacts to the species. Therefore, public outreach as part of species
43 management would have long-term, minor, beneficial impacts.

44 *Overall Impacts of Resource Management Activities.* Overall, impacts to piping plover from species
45 surveying and field activities would be long-term minor to moderate adverse. Although the management

Comment [bdm9]: I reworded this because currently Cape Point and North Ocracoke are open to pedestrians but closed to ORVs.

Comment [dw10]: DW - Currently, but not under alt A.

Comment [bdm11]: North Ocracoke and South Point?

Chapter 4: Environmental Consequences

1 of the species would provide a certain level of benefit, the manner in which buffers would be established,
2 along with the need to adjust buffers frequently would have an adverse impact on the species.

3 **ORV and Other Recreational Use**

4 *ORV and Pedestrian Access.* Alternative A would designate the entire ocean beach of the Seashore as an
5 ORV route or area and would have potential adverse impacts, since it would not guarantee that all adult
6 foraging and nesting habitat would be protected as one contiguous unit. Alternative A would designate an
7 approximately 100-foot wide ORV corridor above the mean high tide line in breeding areas used within
8 past three years and would delineate the corridor with posts placed up to 100 feet above the high tide line.
9 In areas of reduced corridor width (i.e., less than 100 feet), traffic signs would be posted indicating a 10
10 mph speed limit. The ORV corridor would be adjusted whenever possible to allow vehicle passage. If the
11 ORV corridor is not feasible for safety reasons or insufficient area, an alternate ORV route would be
12 identified, if possible. If no alternate route is available, Seashore staff would consider establishing a
13 bypass route. Under alternative A, Seashore staff would allow observations to be responsive to
14 individuality in bird behavior when determining adequate size of closure zones.

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Comment [bdm12]: In Chapt 3 used
Park staff or sometimes resource
management staff. Need to be consistent
between chapters.

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15 A temporary ORV bypass could be used under alternative A, but based on past management this would be
16 expected to be an uncommon occurrence. Such bypasses, if established, would be far removed from
17 piping plover territory as impacts to plovers from human disturbance are well documented in scientific
18 literature and could result in direct mortality (Melvin et al. 1994; Patterson et al. 1991; Flemming et al.
19 1988) and behavioral changes resulting in lower reproductive success (Zonick 2000; Burger 1991). These
20 bypasses would not have an impact on piping plovers as they would be established in a manner that
21 protects habitat and does not impede the brood from foraging.

22 Although buffers established under alternative A were designed to protect piping plover, as demonstrated
23 in "Chapter 3: Affected Environment," compliance with buffers, corridors, and closures is not absolute,
24 which can result in people, vehicles, and pets in proximity to plovers and within plover habitat. Under
25 alternative A, chances for non-compliance (either intentional or not intentional) would be increased as the
26 buffers are variable based on chick behavior and could change frequently. Regular patrols of areas by law
27 enforcement rangers, trained observers, and field biologists would help to deter closure violations. In
28 addition, partnerships with local organizations would help to provide peer-based compliance with
29 closures. However, under alternative A, there is an ORV corridor that provides a conduit or access to the
30 Seashore and no closed ORV areas, so non-compliance would be more possible. A lack of compliance
31 with buffers and closures, including non-compliance (intentional or non-intentional) due to variable
32 buffer sizes, could result in short-term, moderate to major adverse impacts at a particular location, and
33 would result in long-term, moderate adverse impacts if there is a chronic lack of compliance.

34 *Night Driving Restrictions.* Under alternative A, there would be no limitations on night driving. Plovers
35 are known to be active at night (Stainc and Burger 1994; Majka and Shaffer 2008), and plover chick
36 response to vehicles can increase their vulnerability to ORVs (USFWS 1996a). Allowing night driving
37 under alternative A would result in long-term, moderate, adverse impacts as some impacts might occur
38 during critical periods of reproduction and result in harassment, injury, or mortality to one or more
39 individuals.

40 *Commercial Fishing.* Under alternative A, commercial fishing would be managed under special use
41 permit. As part of this permit, terms and conditions would be placed on the permit holder, including a
42 prohibition on entering resource closures. All other closures (safety and seasonal) would be accessible by
43 commercial fishing permit holders. As resource closures would be off limits to commercial fishermen,
44 there would be long-term negligible adverse impacts to piping plover from this use.

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1 *Permitting/Carrying Capacity Requirements.* Under alternative A, there would be no permit or carrying
 2 capacity requirements placed on ORV users at the Seashore. A permit system would provide the Seashore
 3 with a method for dealing with non-compliance, as well as providing education to ORV users regarding
 4 piping plover habitat at the Seashore and its importance. Lack of a permit system would have long-term
 5 moderate adverse impacts. Lack of a carrying capacity is not expected to impact piping plover as ORVs
 6 would not be allowed in resource protection areas, and outside these areas ORV use would be allowed.

7 *Pet/Other Recreational Activity Restrictions.* Alternative A would prohibit camping, restrict beach fires to
 8 the hours of 6 a.m. to 12 a.m., and permit pets at the Seashore year-round, in accordance with 36 CFR
 9 2.13. The prohibition of camping and restriction of beach fires would have long-term, minor benefits to
 10 piping plover, as disturbance from these activities would not be present. The presence of pets at the
 11 Seashore, including during breeding season, has the potential to adversely impact piping plover as some
 12 visitors to the Seashore do not observe the requirement for pets to be restrained in some manner. If there
 13 is little or limited compliance with pet restrictions in the areas of closures, a negative effect on the plovers
 14 could result (USFWS 1996a). This would be mitigated by the prohibition of pets from the landward side
 15 of the posts delineating the ORV corridor at the spits and Cape Point, the prohibition of pets within
 16 symbolic fencing around any bird closure area, and through education and outreach efforts via the park
 17 field personnel and partnerships with local volunteers and organizations, but could still result in long-term
 18 minor to moderate adverse impacts, due to non-compliance.

Comment [bdm13]: Would midnight make it more clear?

19 *Overall Impacts from ORV and Other Recreational Use.* Overall, impacts to piping plover from recreation
 20 and other activities would be long-term moderate adverse as much of the Seashore would be open to
 21 recreational use, with an increased potential that piping plover could be disturbed from recreational
 22 activity. Lack of a permit system, no seasonal-night driving restrictions, and lack of compliance with
 23 leash requirements for additional-pets/camping-restrictions would contribute to these adverse impacts.

Comment [bdm14]: Need to clarify the second half of this sentence. Lack of seasonal night driving restrictions? Get rid of "restrictions"?

24 **Cumulative Impacts.** Past, present, and future actions discussed under the cumulative impact scenario
 25 could be expected to have a range of impacts on piping plover. Various dredging is occurring in the
 26 vicinity of the Seashore, such as the dredging of the federally authorized navigation channel at Oregon
 27 Inlet. These dredging activities fall under two categories, major dredging projects and maintenance
 28 activities. For the dredging of Oregon Inlet, major projects occur every four to five years, with sand being
 29 deposited in areas outside the Seashore, such as on Pea Island. Major dredging of Oregon Inlet is typically
 30 avoided during the breeding season; however, maintenance dredging does occur and could result in short-
 31 term, minor, adverse impacts due to disturbance. When major dredging projects do occur, it is common
 32 for piping plover foraging and nesting habitat at the southern end of Bodie Island spit to slough off into
 33 the channel for a number of months after the dredging operation, which could cause, minor to moderate,
 34 adverse effects to piping plover.

35 Storms and other weather events during the piping plover breeding season (March–August) can result
 36 (depending upon storm intensity) in temporary displacement of and disturbance to nesting birds or even in
 37 the washing away or flooding of nests and eggs (Haig and Oring 1988; Houghton 2005; Cohen 2005a). In
 38 addition to the timing of summer storms, storm severity is also an important variable. Powerful storms
 39 can surge and overwash large areas of piping plover habitat including even up to the toe of the dune and
 40 beyond and result in loss of scrapes, nests, eggs, chicks and even breeding adults. Conversely, winter, late
 41 fall, and early spring storms are capable of having benefits to piping plovers by depositing new materials
 42 and creating overwash areas and hence new nesting and foraging habitat for piping plovers or negative
 43 impacts by eroding and removing otherwise suitable habitat. Hence, the impacts of storms and piping
 44 plovers depend on the timing and severity of storm events and whether they result in piping plover habitat
 45 creation or destruction.

Comment [bdm15]: Not sure if by adding this the citations still stand or add me as a pers comm.?

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1 Hurricanes can also affect the piping plover because of their impact on staff resources. Storm recovery
 2 that pulls staff from resource management (including species monitoring or law enforcement) duties
 3 during piping plover breeding season would have adverse impacts. Conversely, hurricane recovery that
 4 takes place outside of the breeding season would have no direct effect on piping plover and could enhance
 5 piping plover habitat.

6 Commercial fishing harvesting would have negligible impact on piping plovers because plovers do not
 7 feed on any commercially important fish. However, plovers do feed on some of the same prey items of
 8 fish species that may be harvested and as such harvest of fish may mean greater prey encounters for
 9 plovers. In this case the impact of commercial fishing could result in long-term, minor to moderate
 10 increases in prey availability that would have a beneficial impact on piping plover foraging.

11 Several of the local and NPS past, current, and future planning efforts can also affect locally sensitive bird
 12 species. For example new development could result from the implementation of the County Land Use
 13 Development Plans for Dare and Hyde counties, including expected revisions to the Dare County Plan.
 14 The details of any plan revisions are not certain and the potential for impacts on piping plovers is
 15 indeterminate at this time. If increased development within the Seashore's boundaries would result from
 16 the implementation of these plans and increase recreational use of the beaches, adverse impacts to plovers
 17 could occur.

18 The education component of the Seashore's Long-Range Interpretive Plan would provide long-term,
 19 minor to moderate benefits as it would help to educate visitors about the conservation needs of the birds
 20 that inhabit the Seashore and the conservation measures enacted to help protect them.

21 Current predator control and the predator management plan would provide long-term major benefits by
 22 helping to control mammalian predators, such as fox and others, which prey upon plover adults, eggs, and
 23 young. Continuing to remove fox (both red and gray fox), raccoons, cats, and other predators from the
 24 Seashore and continuing to use predator exclosures would be beneficial to the piping plover. However,
 25 predator management actions such as the placement and checking of predator exclosures and traps would
 26 bring people, essential vehicles, and equipment into direct contact with piping plovers and their habitat
 27 because actions and some essential vehicle traffic would occur inside the established buffer. This could
 28 cause short-term, minor, adverse impacts. Predator trapping might result in short-term minor disturbance
 29 to nests and young, or result in loss of nests or hatchlings if trappers are not cognizant of nest locations.
 30 However, overall predator management actions would be highly beneficial.

31 The Cape Lookout Interim Protected Species Management Plan provides long-term, moderate to major,
 32 beneficial impacts to piping plover at the neighboring Seashore through the management policies that it
 33 employs. The outcome of the Cape Lookout National Seashore ORV management plan/EIS would also
 34 have direct, long-term impacts on bird populations within the Seashore as well as within the state of
 35 North Carolina. Specifically, it would have an impact on the region's goal of achieving compliance with
 36 the piping plover recovery plan (USFWS 1996a). However, whether the impact of the ORV plan would
 37 be moderate to major beneficial or adverse to piping plovers would depend upon the management
 38 decisions that are made and ultimately implemented.

39 The replacement of the Herbert C. Bonner Bridge would occur in the vicinity of the Seashore. An EIS and
 40 Biological Opinion for this project found that, "the proposed replacement of the Bonner Bridge... as
 41 proposed, is not likely to jeopardize the continued existence of these species [including piping plover],
 42 and is not likely to destroy or adversely modify proposed critical wintering habitat for the piping plover."
 43 Given these findings, this project would be expected to result in short-term, negligible, adverse impacts to
 44 piping plovers if minimal disturbance ~~from~~ ~~from~~ construction noise and lighting to courting, nesting, and
 45 foraging plovers ~~is~~ ~~would~~ potentially be experienced.

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1 The overall cumulative impacts of these past, current and future actions, would be long-term negligible to
 2 minor, depending on the intensity and duration of unpredictable factors such as storm events, with long-
 3 term moderate beneficial impacts from actions such as increased interpretive programs as part of the long-
 4 range interpretive plan and predator management within the Seashore. Many of these actions do not
 5 directly impact piping plover habitat in the area, as most of this habitat is located within the Seashore and
 6 is impacted by NPS management actions more than any of the aforementioned past, present, and future
 7 actions. These impacts, combined with the long-term minor to moderate, and potentially major adverse, as
 8 well as minor to moderate beneficial impacts of alternative A, would be long-term, moderate adverse
 9 impacts, as actions within the Seashore would act as a driver for overall cumulative impacts.

10 **Conclusion.** Overall, impacts to piping plover from resource management activities would be long-term
 11 minor to moderate adverse. Although the management of the species would provide a certain level of
 12 benefit, the manner in which buffers would be established, along with the need to adjust buffers
 13 frequently would have an adverse impact on the species. Overall, impacts to piping plover from ORV and
 14 other recreational use would be long-term moderate adverse as much of the Seashore would be open to
 15 recreational use, with an increased potential that piping plover could be disturbed from recreational
 16 activity. Lack of a permit system, no seasonal night driving restrictions, and additional-lack of compliance
 17 with pet/camping restrictions leash requirements would contribute to these adverse impacts. The impacts
 18 under alternative A to piping plover, compared to other alternatives are shown in table 45.

Comment [bdm16]: Modify this sentence to be similar to Pg 31, line 18-19.

19 Cumulative impacts under alternative A would be long-term moderate adverse.

20 Impairment to the piping plover would not occur under alternative A because ... EQD to provide

21 **Determination of Effect.** Under the ESA the actions taken under alternative A may affect / are likely to
 22 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and from
 23 recreation uses including the increase in the presence of pets and predators that accompany
 24 recreation/ORV use. Recreation/ORV use could result in major, adverse impacts, especially with the high
 25 level of non-compliance that could result from buffers that adjust often and unpredictably. Further, the
 26 lack of night driving restrictions could contribute to long-term moderate adverse impacts to plovers under
 27 alternative A as plover adults and young are known to forage on beaches at night. These impacts would
 28 result in a finding of may affect/ ~~are~~ likely to adversely affect piping plovers under the ESA because the
 29 action would result in direct or indirect impacts to the species that are not discountable, insignificant, or
 30 beneficial. And while there may be beneficial impacts from monitoring, surveying and management of
 31 recreation, the actions under alternative A would also likely cause some adverse effects.

32 **Impacts of Alternative B: No Action—Continuation of Management under Terms of the Consent**
 33 **Decree**

34 Resource Management Activities

35 *Establishment of Pre-nesting Closures.* Under alternative B, piping plovers would likely benefit from the
 36 increased surveying and resultant closures in the pre-nesting phase. Specifically, in February or early
 37 March of each year, NPS natural resource Park staff would conduct an annual assessment of piping plover
 38 breeding habitat and implement pre-nesting closures in recent breeding areas by posting symbolic fencing
 39 by March 15. The pre-nesting areas would not be reduced to accommodate an ORV corridor, including in
 40 the event of naturally occurring erosion or accretion of the area, except in emergency situations. The
 41 closures would remain in place until the later of July 15 or two weeks after the last piping plover, tern,
 42 black skimmer, American oystercatcher, or Wilson's plover chick within the area has fledged, as
 43 determined by two consecutive monitoring events. The establishment of seasonal closures earlier in the

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1 season would ensure those piping plovers arriving early are afforded protective buffers, and would result
2 in long-term moderate benefits for the species.

3 *Surveying and Monitoring.* Under alternative B, surveying would follow guidelines in the 1996 USFWS
4 Piping Plover Recovery Plan, as well as survey procedures identified in the Interim Protected Species
5 Management Strategy, as modified by the consent decree. NPS would survey piping plover habitat at
6 Cape Point and South Beach, Hatteras Spit, and the northern and southern ends of Ocracoke at least once
7 every two days from March 15 to April 15, and daily from April 16 to July 15, to determine if any birds
8 are exhibiting prenesting and/or breeding behavior. The Seashore would monitor Bodie Island spit at least
9 daily from March 15 to July 15. Potential new habitat, if any, at other locations would be surveyed two
10 times per week.

Comment [bdm17]: Check for consistency throughout document.

11 By surveying the historic areas and new potential habitat beginning March 15, the likelihood that any
12 piping plovers establishing territories in these areas would be detected increases. Observations of piping
13 plover in these areas would continue until at least July 15, which would positively affect plovers that
14 might not establish nests until later in the season. Pre-nesting areas would be left in place until July 15 or
15 two weeks after all chicks of any species in the area have fledged, whichever occurs later. Other buffers
16 for piping plovers (e.g., buffers installed based on observed breeding or foraging behavior) would be
17 removed two weeks after the last observed activity, or after chicks have fledged.

18 Surveying would bring people and/or essential vehicles into direct, short-term contact with piping plovers
19 and their habitat, and these activities themselves are a known risk factor, especially during the more
20 sensitive life stages of early pre-nesting and territory establishment. However, many precautions would be
21 taken by staff to minimize impacts, for example, using scopes to watch the birds from a distance and
22 remaining outside closures to the extent possible, and the protection that results from surveying would
23 result in long-term, moderate beneficial impacts, as any changes in species behavior would be detected
24 and appropriate management measures implemented.

25 *Buffer/Closure Establishment.* Under alternative B, if breeding behavior, including but not limited to
26 territorial behavior, courtship, mating, confirmed scrapes, or other nest building activity, or breeding adult
27 piping plover foraging occurs outside of an established closure, NPS Park staff would establish a 50-
28 meter (164-foot) buffer around the observed activity. If disturbance from ORVs and/or pedestrians occurs
29 within the given buffer distance, the buffer zone would be expanded in 50-meter (164-foot) increments
30 until no disturbance occurs. Behaviors indicating disturbance would include defensive displays, alarm
31 calls, flushing or leaving a nest or feeding area, or exhibiting a broken wing display, and diving or
32 mobbing pedestrians, dogs, or vehicles. Deliberate acts of vandalism or acts that result in disturbance to
33 bird behavior would result in an automatic expansion of pre-nesting areas or buffers in increments of 50
34 meters, 100 meters, and 500 meters.

Comment [bdm18]: Mobbing only exhibited by terns.

35 If buffers are expanded for any of the reasons stated above, the ORV corridor would not be adjusted to
36 accommodate ORV use. For observed piping plover prenesting and/or breeding behavior, NPS would
37 establish the prescribed buffer as quickly as possible, but always within eight daylight hours. Upon
38 discovery of an active nest or chicks that are outside an existing closure, protective measures would be
39 taken immediately to close and establish the buffers described above. Symbolic fencing with the
40 applicable buffer distances stated above would be installed as soon as NPS Park staff can reasonably be
41 mobilized to erect/install the fencing, but always within six daylight hours.

42 Under alternative B, ~~and as described under alternative A~~ broods would be observed in the mornings and
43 late afternoons, ~~all broods would be observed continually during daylight hours during the first week;~~
44 however, buffer distances for piping plover chicks would be substantially larger for the first two weeks
45 after hatching and may sometimes stay in effect until fledging, as described in the next section, ~~and~~ The

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1 larger buffers would be longer lasting under Alternative B, which would have moderate to major benefits
 2 to piping plover chicks. The size of buffers for piping plover chicks could be reduced after two weeks, but
 3 special monitoring provisions would apply, as described in the next section.

4 Alternative B provides for protection of piping plover nests through the use of buffer distances
 5 recommended under the piping plover recovery plan (USFWS 1996a). Further, additional information
 6 would be collected during this life stage from daily observations via use of optical equipment from
 7 ~~outside the symbolic fencing an adequate distance to prevent disturbance and from close approaches to~~
 8 ~~nests once per week to observe visually inspect the nest and record data check on the exclosure.~~ Staff
 9 observing bird location and behavior would implement the prescribed buffers as a minimum, but would
 10 have the flexibility to increase the size of closures, as some individual piping plovers may require larger
 11 buffers than others (USFWS 1996a). Except for the potential disturbance caused by the once per week
 12 nest ~~examination inspection~~, the larger and more responsive buffers under alternative B would be expected
 13 to have long-term, minor to moderate, beneficial effects on the species as ~~park personnel staff~~ and
 14 recreationists who respect resource closures would be kept a safe distance (a minimum of 50 meters (164
 15 feet)) from incubating adults and their nests.

16 *Management of Wintering/Non-breeding Populations.* As provided in the USFWS Amended Biological
 17 Opinion (USFWS 2007a) and described in alternative A, ~~the NPS park staff~~ would monitor the presence,
 18 abundance, and behavior of migrating and wintering piping plovers from August 1 to March 31 of each
 19 year following the Southeast Coastal Network (SECN) survey protocol, and close suitable habitat as
 20 described under alternative A. These closures would provide beneficial impacts to species during this life
 21 stage, as described under alternative A, and the addition of a surveying plan would provide park managers
 22 with information on the ~~types and locations~~ of habitats used by non-breeding piping plovers, seasonality,
 23 and times of day used, and ~~the locations of those habitats as well as potential threats they may contain.~~
 24 Surveying would increase knowledge on how and when piping plovers use the park and enable adaptive
 25 management initiatives. These actions would result in long-term moderate beneficial impacts.

Comment [bdm19]: Make same changes as on Pg 29, line 25-27.

26 *Education and Outreach.* Under alternative B and as described under alternative A, the public would
 27 continue to receive information at the visitor centers about piping plovers and their ecology and the
 28 measures the park is taking to protect the species. In addition, the public would be provided education
 29 through the required night driving permit and protected species information would be provided at all
 30 access points. As with alternative A, public outreach as part of species management would have long-
 31 term, minor, beneficial impacts, with the expanded outreach having greater impacts than alternative A.

32 *Overall Impacts of Resource Management Activities.* Overall impacts under alternative B from species
 33 surveying and field activities would be long-term minor to moderate beneficial. Although the buffer
 34 establishment would have adverse impacts due to the size of the buffer, they would be more constant,
 35 larger, and provide more protection compared to alternative A and would have less of an adverse impacts.
 36 The benefits from the pre-nesting closures, along with the benefits from increased surveying and
 37 monitoring, would result in long-term minor to moderate beneficial impacts.

38 ORV and Other Recreational Use

39 *ORV and Pedestrian Access.* Under alternative B, management of ~~off road vehicle~~ ORV use and access at
 40 the Seashore would be a continuation of management under alternative A, except where modified by
 41 specific species protection measures from the April 30, 2008 consent decree. These management
 42 modifications include increasing the size of the buffers provided to various species at the Seashore, as
 43 well as restrictions imposed related to night driving. Specifically, ORV Corridors under alternative B are
 44 the same as alternative A, except that from March 15 – November 30 ~~at all locations not in front of the~~
 45 villages that are open to ORV use, NPS would provide an ORV-free zone in the ocean backshore at least

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1 10 meters wide, wherever there is sufficient beach width to allow an ORV corridor of at least 20 meters
2 above the mean high tide line.

3 Alternative B would designate the entire ocean beach of the Seashore as an ORV route or area and would
4 provide for closures of piping plover pre-nesting areas, as well as closures based on observations of
5 breeding behavior, foraging, and chick movements. Alternative B would designate an approximately
6 100-foot (30-meter) wide ORV corridor above the mean high tide line ~~in breeding areas used within past~~
7 ~~three years and would delineate the corridor with posts primarily in areas away from the spits and Cape~~
8 ~~Point.~~ The speed limit on park beaches would be 15 mph from May 15 to September 15, unless otherwise
9 posted; and 25 mph from September 16 to May 15, unless otherwise posted. Under alternative B and as
10 described in the previous section, staff would monitor piping plover habitat for signs of breeding behavior
11 and human disturbance, ~~and to ensure the timely installation of resource closures and the ensure~~ adequacy
12 of prescribed buffers. Resource protection areas would not be adjusted to accommodate ORV use.

13 Impacts to plovers from human disturbance are well documented in scientific literature and could result in
14 direct mortality (Melvin et al. 1994; Patterson et al. 1991; Flemming et al. 1988) and behavioral changes
15 resulting in lower reproductive success (Zonick 2000; Burger 1990). Alternative B is designed to redirect
16 ORV routes and corridors to areas that would not impact the brood, and any bypass route would be closed
17 if it was within 1,000 meters (3,281 feet) of a brood. ~~With the presenee of trained Trained Park NPS staff~~
18 ~~in the area, the park would be able to monitor bird behavior as well as observed acts of disturbance.~~
19 ~~Through contact on the beach, websites, posted information at access points, and information available at~~
20 ~~the visitors centers, the public would be informed of alternate routes and ways to reduce their effect on~~
21 ~~the plovers (e.g., removing trash, reduced speed limit, etc.), and locations, and inform the public of~~
22 ~~alternate routes and ways to reduce their effects on the plovers (e.g., removing trash, reduced speed limit,~~
23 ~~etc.).~~

Comment [bdm20]: Check CD wording for first two weeks after hatching. Then....

Comment [bdm21]: Park staff?

24
25 If ~~NPS Park staff~~ observes that ORVs or pedestrians ~~use are~~ impacting piping plovers, ~~increased the~~
26 ~~buffers and monitoring described above~~ would be implemented. When piping plover chicks are present,
27 an ORV closure area would extend for 1,000 meters (3,281 feet) on each side of a line drawn through the
28 nest site and perpendicular to the long axis of the beach ~~for the first two weeks after hatching.~~ The
29 resulting closure ~~would extend from the ocean side low water line to the bayshore low water line or the~~
30 ~~dune line if no bayshore habitat exists, and ORV use would be prohibited in these areas.~~

31 ORVs may be allowed to pass through portions of the protected area, where the protected area is
32 considered by ~~NPS Park staff~~ to be inaccessible to piping plover chicks because of steep topography,
33 dense vegetation, or other naturally occurring obstacles. All of the ocean beach at Cape Point, South
34 Beach, and North Ocracoke and all of the ~~bayshore sound side~~ and ocean beach at Bodie Island Spit and
35 Ocracoke South Point would be considered accessible to piping plover chicks ~~in these areas.~~ Within the
36 1,000-meter piping plover unfledged chick buffer at Hatteras Spit, all of the ocean beach and that part of
37 the ~~bayshore sound side~~ beach at the overwash fans and from the inlet east to a point 200 meters east of
38 the point where the Spur Road from the Pole Road meets the ~~bayshore sound~~ would be considered
39 accessible to piping plover chicks in these areas.

40 Under alternative B, during daylight hours only, ~~NPS Park staff~~ may allow ORV access within the 1,000-
41 meter unfledged piping plover chick buffer two weeks after the chicks have hatched. When ORV access
42 is allowed, a buffer distance of 300 meters between piping plover chicks and ORVs would be maintained
43 at all times. The chicks would be monitored from dawn to dusk by ~~NPS Park staff~~ with at least one full
44 season experience monitoring piping plovers or snowy plovers. The modified access area would not be
45 open to ORVs, each morning, until the location of the brood has been determined by an ~~NPS monitor~~

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1 qualified monitor and an adequate buffer has been assured. If a piping plover adult or chick moves within
 2 200 meters of ORVs or an ORV access corridor, the ~~NPS-Park~~ staff on site would immediately take
 3 protective measures to close and re-establish the 1,000-meter buffer, including contacting law
 4 enforcement to begin evacuation of the area; no additional nonessential ORVs would be allowed within
 5 the 1,000-meter unfledged piping plover chick buffer. NPS would retain the discretion to re-establish the
 6 1,000-meter buffer at any time, if it deems the full closure to be necessary. Locations of the described
 7 buffers would be adjusted to accommodate chick movement.

8 Given the increased level of monitoring at the key piping plover breeding areas and the significantly
 9 larger buffers when piping plover chicks are present, alternative B would offer more protection than
 10 alternative A for the species from recreational use, but the potential for impacts from recreational use
 11 would still exist, resulting in long-term minor to moderate adverse impacts.

12 *Night-driving Restrictions.* Under alternative B, night driving of all recreational ORV traffic would be
 13 prohibited in these areas: ocean intertidal zone, ocean backshore, and dunes, from 10 p.m. until 6 a.m.
 14 from May 1 to September 15. However, from September 16 to November 15, night driving permits would
 15 be available for authorized nonessential driving between the hours of 10 p.m. and 6 a.m. The permit has
 16 an educational component, and the permit would contain restrictions on light use during the September 16
 17 to November 15 permitted night driving period. Furthermore, NPS retains the discretion to limit night
 18 driving to certain areas or routes, based on resource protection considerations. Because plovers are known
 19 to be active at night (Staine and Burger 1994; Majka and Shaffer 2008), and plover chick and fledgling
 20 response to vehicles can increase their vulnerability to ORVs (USFWS 1996a), restrictions on night-
 21 driving under alternative B would ~~be~~ provide long-term minor to moderate benefits to piping plovers;
 22 however, alternative B could still result in long-term, minor, adverse impacts during the time when night-
 23 driving is allowed (until 10 p.m. May 1 – September 15, during the piping plover breeding season, when
 24 plover migrants may be passing through the area and part of migrating season, and 24 hours a day all
 25 other times a year).

26 *Commercial Fishing.* Commercial fishing restrictions under alternative B would be the same as those
 27 under alternative A, with those holding commercial fishing permits restricted from night driving from
 28 10 p.m. until 5 a.m. (as opposed to 6 a.m. for recreational users); from May 1 to September 15. As with
 29 recreational users, commercial fishing permit holders can get a permit for night-driving from September
 30 16 to November 15. Presence of commercial fishing operations would have a long-term negligible
 31 adverse impact, with long-term minor to moderate beneficial impacts from night-driving restrictions.

32 *Permit Carrying Capacity Requirements.* As described under night-driving restrictions and education,
 33 alternative B would require a night-driving permit. As stated in these sections, the result of the education
 34 provided by the permit and the restriction on night driving, there would be long-term minor to moderate
 35 benefits from the species protection offered from these elements. There would be no impacts related to
 36 carrying capacity, as described under alternative A.

37 *Pet/Other Recreational Activity Restrictions.* Alternative B would have the same restrictions on camping,
 38 beach fires, and pets as under alternative A, with the addition of no ORV use from 10 p.m. to 6 a.m.
 39 during May 1 to September 15. As with alternative A, there is the potential for non-compliance with pet
 40 regulations that would be mitigated by... All pets are prohibited the prohibition of pets from the
 41 landward side of the posts delineating the ORV corridor at the spits and Cape Point, the prohibition of
 42 pets from entering the within-symbolic fencing used to delineate around any bird closure areas, and
 43 through education and outreach efforts via the of P-park field personnel staff would help minimize
 44 adverse impacts and and partnerships with local volunteers and organizations, and would result in long-
 45 term minor to moderate adverse impacts, due to non-compliance.

Comment [bdm22]: I'm not sure if mitigation is the right word here. Presence of LE and other Park staff would help ensure compliance of the pet leash requirement.

Chapter 4: Environmental Consequences

1 *Overall Impacts from ORV and Other Recreational Use.* Overall, impacts from alternative B to piping
 2 plover from recreation and other activities would be long-term minor to moderate adverse. While buffers
 3 would be increased and more constant to keep recreational uses separated from the species, access up to
 4 these buffers would be provided throughout the Seashore and could result in intentional or un-intentional
 5 non-compliance (*i.e. when signs are washed out*), which would impact the species.

6 **Cumulative Impacts.** The past, present, and future actions discussed under the cumulative impact
 7 scenario for alternative A could be expected to be the same under alternative B. The overall cumulative
 8 impacts of these past, current and future actions, would be long-term negligible to minor, depending on
 9 the intensity and duration of unpredictable factors such as storm events, with long-term moderate
 10 beneficial impacts from actions such as increased interpretive programs as part of the long-range
 11 interpretive plan and predator management within the Seashore. Many of these actions do not directly
 12 impact piping plover habitat in the area, as most of this habitat is located within the Seashore and is
 13 impacted by NPS management actions more than any of the aforementioned past, present, and future
 14 actions. These impacts, combined with the long-term minor to moderate, and potentially major adverse, as
 15 well as minor to moderate beneficial impacts of alternative B, would be long-term, minor to moderate
 16 adverse impacts, as actions within the Seashore would act as a driver for overall cumulative impacts.

17 **Conclusion.** Overall impacts under alternative B from resource management activities would be long-
 18 term minor to moderate beneficial. Although the buffer establishment would have adverse impacts due to
 19 the size of the buffer, they would be more constant, larger, and provide more protection compared to
 20 alternative A and would have less of an adverse impacts. The benefits from the pre-nesting closures,
 21 along with the benefits from increased surveying and monitoring, would result in long-term minor to
 22 moderate beneficial impacts. Overall, impacts from alternative B to piping plover from ORV and other
 23 recreational use would be long-term minor to moderate adverse. While buffers would be increased and
 24 more constant to keep recreational uses separated from the species, access up to these buffers would be
 25 provided throughout the Seashore and could result in intentional or un-intentional non-compliance, which
 26 would impact the species.

27 Cumulative impacts under alternative B would be long-term, minor to moderate adverse.

28 **Impairment to the piping plover would not occur under alternative B because ... EQD to provide**

29 **Determination of Effect.** Under the ESA the actions taken under alternative B may affect / are likely to
 30 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and the
 31 moderately beneficial impacts from the establishment of large and longer lasting seasonal closures earlier
 32 in the season that would help ensure that early-arriving and nesting plovers are afforded protective
 33 buffers. The pre-nesting breeding closures ~~along with those established and modifications made to them~~
 34 ~~throughout the during-breeding season and post-breeding~~ could result in long-term moderate adverse
 35 impacts for the species. Further, the partial night driving restrictions could contribute to long-term
 36 moderate adverse impacts to plovers under alternative B as plovers ~~adults and young~~ are known to forage
 37 ~~on beaches the shoreline in the evenings before night driving restriction kick in~~ during all hours. These
 38 impacts would result in a finding of may affect/~~are~~ likely to adversely affect piping plovers under the
 39 ESA because the action would result in direct or indirect impacts to the species that are not discountable,
 40 insignificant, or beneficial. And while there may be beneficial impacts from monitoring, surveying and
 41 management of recreation, the actions under alternative B would also likely cause some adverse effects.

Comment [bdm23]: Night driving restrictions kick in on May 1 so there couldn't be any PPL chicks on the ground.

42 **Impacts of Alternative C: Seasonal Management**

43 **Resource Management Activities**

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1 *Establishment of Pre-nesting/Seasonal Closures.* Pre-nesting surveying activities for piping plovers under
 2 alternative C would include the survey and evaluation of all potential breeding habitats by NPS Park staff
 3 by March 1 of each year with piping plover pre-nesting closures recommendations based on that
 4 evaluation. Alternative C would establish Species Management Areas (SMAs), which are defined as areas
 5 of suitable habitat that have had concentrated and recurring use by multiple individuals and/or multiple
 6 species of protected shorebirds during the breeding or nonbreeding season (details are provided in "table
 7 4. Species Management Strategies for Action Alternatives" in chapter 2). Under alternative C, all
 8 designated breeding SMAs would be posted as pre-nesting closures using symbolic fencing by March 15
 9 each year. Within the SMA, areas would be designated for two different management levels (ML). ~~under~~
 10 ~~ML1 or ML2 procedures.~~ Under ML1 management, ORV or pedestrian access would not be allowed
 11 while pre-nesting closures are in effect. Under ML2 management, once pre-nesting closures are
 12 implemented, a narrow ORV access corridor or pedestrian corridor ~~would potentially be established.~~
 13 Under alternative C, Bodie Island Spit, Cape Point, and South Point would be established as SMAs and
 14 managed under ML2. The remaining SMAs would be managed under ML1. These pre-nesting closures as
 15 well as the ~~and~~ establishment of SMAs would have long-term moderate beneficial impacts as closures
 16 would be in place to protect migrant PIPs and early-arriving PIP birds establishing territories early in
 17 the breeding season.

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18 *Surveying and Monitoring.* From March 15–July 15 areas within any pre-nesting closures would be
 19 monitored three times per week and ~~in~~ areas outside of any pre-nesting closures would be monitored two
 20 times per week which would be increased to three times per week if birds are detected during monitoring.
 21 Piping plover nests would be looked for by conducting "walk throughs" every three days. Once piping
 22 plover nests are found they would be observed daily from a distance that does not disturb the birds, based
 23 on professional judgment. Nests would be approached once per week to visually inspect the nest ~~observe~~
 24 ~~and record data~~ check on the enclosure. Alternative C would include surveying all suitable breeding
 25 habitat three times a week to detect adults with an associated scrape area or nest territory foraging outside
 26 of an existing closure, which would allow for potential closures for foraging in the areas near known
 27 breeding sites. If breeding adult piping plover are observed foraging outside of an existing closure, the
 28 site would be surveyed daily to look for signs of courtship and/or nesting building. If piping plover are
 29 observed foraging outside of a closure on two consecutive surveys, a buffer would be either established or
 30 expanded using flexible increments based on observed bird behavior to include entire length of the
 31 foraging site. These foraging area closures would be removed if no piping plover foraging is observed for
 32 a two-week period during the breeding season, or when any associated breeding activity has concluded.
 33 Under alternative C, piping plover nests and/or chicks would be surveyed and those with broods under
 34 ML1 management would be observed at least once a day and broods under ML2 management would be
 35 observed daily for at least one hour each in the morning and one hour in the afternoon, a.m. and p.m. on
 36 ~~a daily basis.~~ Monitor(s) would be present during all periods of ORV or pedestrian access. Observations
 37 under ML1 and ML2 management would end once chicks have fledged (chicks are considered fledged at
 38 35 days of age or are observed in sustained flight of at least 49 feet [15 meters]). Surveying and
 39 monitoring during all life stages, as described above, would bring people and/or essential vehicles into
 40 direct, short-term contact with piping plovers and their habitat, and these activities themselves are known
 41 risk factors, especially during the more sensitive life stages of early pre-nesting and territory
 42 establishment. However, because many precautions would be taken by staff to minimize impacts, (for
 43 example, using scopes to watch the birds from a distance and remaining outside closures to the extent
 44 possible), the protection that results from surveying would be expected to have long-term moderate
 45 beneficial impacts, as these actions would improve the sustainability of the species at the Seashore.

46 *Buffer/Closure Establishment.* Under alternative C, during the breeding season, ML1 measures would be
 47 implemented at South Beach, Hatteras Inlet spit and North Ocracoke and ML2 measures would be
 48 implemented at Bodie Island Spit, Cape Point, and South Point Ocracoke where ML2 measures would be
 49 implemented. Both ML1 and ML2 would provide 75-meter buffers around any piping plover nests, nest

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(B)

1 scrapes and around any piping plover exhibiting breeding behavior. ML2 differs from ML1 in that it has
 2 the potential to establish a narrow access corridor open to ORVs where ORV use is permitted or the
 3 corridor could be open only to pedestrians, where ORV use is not permitted. Upon the first observation of
 4 breeding activity, the standard buffers would apply, which depending upon the circumstance could close
 5 the access corridor. NPS would retain the discretion to expand nest buffers under ML1 and ML2
 6 depending on staffing and bird behavior. In unprotected areas, a buffer would be established immediately
 7 when a nest with egg(s) is found. Prior to hatching, vehicles may pass by such areas within designated
 8 ORV access corridors that have been established along the outside edge of nesting habitat, provided that
 9 buffers adequate to prevent human disturbance are maintained. When nests or chicks occur in the
 10 immediate vicinity of paved roads, parking lots, campgrounds, buildings, and other facilities, NPS would
 11 retain the discretion to provide resource protection to the maximum extent possible while still allowing
 12 those facilities to remain operational. NPS would not reduce buffers to accommodate ORV ramp access
 13 under alternative C. Under alternative C, buffers would remain in place for two weeks after a nest is lost
 14 to determine if birds would re-nest. Outside of pre-nesting areas, piping plover buffers would be removed
 15 if no breeding activity is seen in the area for two weeks, or two weeks after all chicks have fledged,
 16 whichever comes later. For unfledged piping plover chicks, ML1 would provide a 1,000-meter buffer for
 17 ORVs and pedestrians and ML2 a 1,000-meter buffer for ORVs and a 300-meter pedestrian buffer and
 18 buffers moves with chicks. This buffer would extend from the oceanside low water line to the soundside
 19 low water line or to the farthest extent of dune habitat if no soundside intertidal habitat exists.

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20 Piping plovers would likely experience long-term moderate benefits from the size of the resource closures
 21 under ML1 and ML2 and the fact that buffers would adjust in response to chick mobility, as these actions
 22 would be expected to improve the sustainability of the species at the Seashore.

23 Under alternative C, broods under ML1 would be observed once per day and broods under SM2 would be
 24 observed for a minimum of one hour in the morning and one hour in the afternoon, whereas under
 25 alternatives A ~~and B~~, broods would be observed continually during daylight hours during the first week
 26 and thereafter if the buffer size is 600 meters or less, or daily if the buffer is increased. Under alternative
 27 B, a 1000 meter buffer would be established for the first two weeks after hatching and the brood would be
 28 observed for a minimum of one hour in the morning and one hour in the afternoon. If the buffer is
 29 reduced to 300 meters after the first two weeks then the brood will be monitored from dawn to dusk until
 30 fledging.

31 In addition to the establishment of pre-nesting areas, alternative C provides for protection of piping plover
 32 nests outside of the SMAs through the use of buffer distances recommended, in part, under the Piping
 33 Plover Recovery Plan (USFWS 1996a). Deviation from these recommendations and establishment of a
 34 75-meter buffer around known nests in these cases is based on studies that show a greater susceptibility to
 35 disturbance in similar environments and Seashore Park staff observations (see "Elements Common to All
 36 Action Alternatives," in chapter 2). Although the species would be offered protection by these buffers
 37 short-term adverse impacts could result to piping plover if adjustments to a buffer are not made in a
 38 timely manner or if nests or acts of deliberate disturbance are missed by NPS Park staff outside of the
 39 SMAs areas. Therefore, the buffers under alternative C would be expected to have long-term, moderate,
 40 beneficial effects on the species because the benefits outweigh the adverse effects.

41 Management conducted during pre-nesting and nesting life stages would bring people and/or essential
 42 vehicles into direct, long-term contact with piping plover and their habitat, and these activities themselves
 43 are known risk factors, especially during the sensitive, early life stages of pre-nesting and territory
 44 establishment. However, management also results in providing appropriate protection to piping plover
 45 during these early stages of the annual nesting cycle that would otherwise expose piping plover to
 46 disturbances from a variety of activities that might do them far more harm and/or result in nest
 47 abandonment or abandonment of the area by the individual or pair. Hence, ~~and on balance,~~ management

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1 provides long-term, minor to moderate, beneficial impacts to piping plover that may affect / is not likely
2 to adversely affect piping plovers under alternative C.

3 A systematic review of data, annual reports, and other information would be conducted by NPS Park staff
4 every 5 years, after a major hurricane, or if necessitated by a significant change in protected species status
5 (e.g., listing or de-listing), in order to evaluate the effectiveness of management actions in making
6 progress toward the accomplishment of stated objectives. Periodic review could result in changes to the
7 management actions in order to improve effectiveness. When desired future conditions for resources are
8 met or exceeded, periodic review and adaptive management may allow for more flexible management of
9 recreational use, provided adverse impacts of such use are effectively managed and wildlife populations
10 remained stable. Where progress is not being made toward the attainment of desired future conditions,
11 periodic review and adaptive management may provide for additional management including appropriate
12 restrictions on recreational use. Periodic review could result in changes to the management actions in
13 order to improve effectiveness, which would have long-term moderate beneficial impacts.

14 *Management of Wintering/Nonbreeding Populations.* During the non-breeding season, NPS Park staff
15 would monitor presence, abundance, and behavior of migrating and wintering shorebirds in all SMAs
16 from July through May using the SECN protocol. These surveying plans would result in moderate,
17 beneficial impacts to plovers by providing park managers with information on the types and location of
18 habitats used by non-breeding piping plovers, seasonality of plover use of the Seashore, tidal influences
19 on habitat use, and potential threats the habitat may contain ~~seasons, and times of day used, and the~~
20 ~~locations of those habitats as well as potential threats they may contain.~~ Surveying would increase
21 knowledge on how and when piping plovers use the park and enable adaptive management initiatives.

Comment [bdm24]: Use same wording as Pg 29, lines 25-27.

22 During the non-breeding season under alternative C, SMAs would be established at the points and spits
23 based on an annual habitat assessment. In addition, year-round non-ORV areas along the ocean shoreline
24 outside of the villages would be managed as Non-breeding Shorebird SMAs with recreational activity
25 restrictions such that if staff determines that any single recreational activity or collection of activities is
26 negatively impacting non-breeding piping plover use of a specific location. NPS may implement
27 additional restrictions on activities. Regarding timing, under alternative C, all SMAs are closed to ORVs
28 7 months per year and a pedestrian access corridor is established at Bodie Island Spit, Cape Point, and
29 South Point Ocracoke on March 15 (subject to ML2 actions when breeding activity observed).

why is this under non-breeding?

Comment [bdm25]: This is not what was stated earlier. See Page 39, line 30.

30 As with management that takes place during pre-nesting ~~and nesting~~ incubation and brood rearing life
31 stages, post-breeding management conducted during the non-breeding life stages would bring people
32 and/or essential vehicles into direct, long-term contact with piping plover and their habitat, and these
33 activities themselves are known to result in disturbance to foraging and resting plovers. However,
34 management also results in providing some appropriate protection to piping plover during non-breeding
35 life history stages that might otherwise expose piping plover to far more disturbances. Although migrant
36 plover can and do utilize the entire shoreline, a large portion of the preferred stopover sites (i.e. Bodie spit
37 and South Point Ocracoke) remain closed to ORVs throughout the period when migrants are observed in
38 the spring and fall and throughout the winter for the small population that overwinters at the Seashore.
39 Hence, and on balance, non-breeding management protocols under alternative C provides long-term,
40 moderate, beneficial impacts to non-breeding piping plover.

[Handwritten signature]

41 *Education and Outreach.* Under alternative C, education and outreach activities would be the same as
42 those described under alternative A, with the addition of educational requirements as part of a permit
43 program. This additional education would result in long-term minor to moderate benefits to species as the
44 public is provided with more information regarding this issue.

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1 *Overall Impacts of Resource Management Activities.* Overall impacts under alternative C from surveying
 2 and field activities would be long-term moderate beneficial. As with alternative B, some level of adverse
 3 impact would occur from human presence during monitoring activities, but on the whole the
 4 establishment of SMAs early in the breeding season, monitoring activities, and establishment of large
 5 buffers would provide long-term moderate beneficial impacts to the species.

6 **ORV and Other Recreational Use**

7 *ORV and Pedestrian Access.* Under alternative C, areas of high resource sensitivity (SMAs) and high
 8 visitor use would generally be ~~designated non-ORV routes~~ closed to pedestrians and ORVs during the
 9 breeding season (corresponding to the and park visitation period of ~~March 15 to October 14~~). ORV
 10 routes would be designated outside of these locations during the same period. Some of the seasonal non-
 11 ORV areas would be open to ORV use during the off-season (October 15 to March 14), while some areas
 12 would remain vehicle-free year-round to provide opportunities for non-ORV users to experience the
 13 Seashore without the presence of vehicles. The establishment of SMAs and other non-ORV use areas
 14 would serve to reduce pressure on the species from recreational uses, as compared to alternatives A and
 15 B.

Comment [bdm26]: SMAs correspond to ML1 and ML2 and ML2 only occur at the spits and Cape Point. Under ML1, ORV or pedestrian access would not be allowed while pre-nesting closures are in effect.

16 Approximately 27.4 miles of shoreline would be open year-round to ORV use, approximately 28.7 miles
 17 would be open to seasonal ORV use from October 15 through March 14; and approximately 11.9 miles
 18 would be closed to ORV use. The speed limit would be 15 mph unless otherwise posted and permits
 19 would be required for all ORVs. Three areas of seasonal ORV use would be managed under ML2
 20 procedures and would maintain an open pedestrian access corridor along the shoreline to the inlet or
 21 point, subject to resource closures.

Comment [bdm27]:

22 The seasonal restriction on ORVs and pedestrians in SMAs, the level of monitoring provided, and the size
 23 of the buffers under alternative C would reduce the potential of disturbance and nest abandonment from
 24 direct, short-term contact with people and/or essential vehicles compared to alternatives A and B. In
 25 addition, the preclusion of ORV access in the SMAs for the entire breeding season would reduce the level
 26 of recreational use in sensitive resource areas. Although these measures should limit adverse impacts to
 27 piping plover, compliance with closures may not be absolute, since alternative C still includes pedestrian
 28 access to ~~Bodie Island and the three major points and spits, Cape Point, and South Point Ocracoke~~ during the
 29 breeding season, ~~if and~~ the areas closed within the ORV/pedestrian corridors are not expansive or
 30 contiguous. Therefore, recreational uses could result in short-term moderate adverse impacts if non-
 31 compliance occurs.

Comment [bdm28]: And ORVs?

Comment [dw29]: DW – no ORVs allowed Mar - Oct

32 Establishment of SMAs and large buffer areas and exclusion of ORVs from these areas would reduce
 33 pressure on the species by recreational uses at the Seashore. Under this alternative, recreational activities
 34 would still occur in the vicinity of the species and would still have the potential to impact them, with
 35 minor to moderate adverse impacts to piping plover from recreational use, and minor to moderate benefits
 36 from the protection offered.

37 *Night-driving Restrictions.* Under alternative C, night driving of all nonessential ORV traffic would be
 38 prohibited from all areas (other than the sound side), from 7:00 pm to 7:00 am from May 1 to November
 39 15. From November 16 to April 30, night driving would be allowed 24 hours per day in designated ORV
 40 routes for vehicle holding a valid ORV permit. Furthermore, NPS retains the discretion to limit night
 41 driving to certain areas or routes, based on resource protection considerations. Because plovers are known
 42 to be active at night (Staine and Burger 1994; Majka and Shaffer 2008), and plover chick and fledgling
 43 response to vehicles can increase their vulnerability to ORVs (USFWS 1996a), the high level of
 44 protection at night from May 1 to November 15 under alternative C would result in long-term, moderate,

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1 beneficial impacts because it would reduce the potential for disturbance to chicks that could result in
2 mortality.

3 *Commercial Fishing.* Management of commercial fishing vehicles would be the same as under alternative
4 A, and would be managed by the terms and conditions in the commercial fishing special use permit,
5 which include restriction from entering resource closures. Commercial fisherman would not be required
6 to obtain an ORV permit, but would be regulated under their existing use permit. Under alternative C,
7 commercial fishing vehicles would be authorized to enter non-ORV areas. ~~They are not allowed to enter~~
8 ~~resource closures except for full resource closures and/or lifeguarded beaches, and a~~ Night driving
9 restrictions, which are applicable to all ORV use, could be modified by up to +/- 2 hours ~~outside of~~
10 ~~existing resource closures for commercial fishing purposes.~~ Presence of commercial fishing
11 operations would have a long-term negligible adverse impact, with long-term minor to moderate benefits
12 from night-driving restrictions.

13 *Permit/Carrying Capacity.* As described under night-driving restrictions and education, alternative C
14 would require a permit for ORV use, which would include night-driving. As stated in these sections, the
15 result of the education provided by the permit and the restriction on night driving, there would be long-
16 term minor to moderate benefits from the species protection offered from these elements. ORV carrying
17 capacity established under alternative C would not directly impact piping plover, as ORV use would not
18 be allowed in resource protection areas.

19 *Pets/Other Recreational Activities.* Pets would be prohibited within all SMAs and are prohibited from
20 ORV access corridors during pre-nesting; however, compliance would be needed to ensure that this
21 reduces the risks of impacts. In addition, an educational permit would be required for any beach fire year
22 round, which would inform visitors about species protection issues related to this recreational use.
23 Camping restriction would be the same as alternative A, with additional requirements for removing beach
24 equipment. These restrictions would result in long-term minor to moderate benefits to species at the
25 Seashore, further reducing pressure to piping plover from recreational activity.

26 *Overall Impacts from ORV and Other Recreational Use.* Overall impacts under alternative C from
27 recreation and other activities would be long-term minor adverse. The establishment of the SMAs which
28 proactively preclude recreational use early in the breeding season, permit requirements, seasonal night
29 driving restriction, and pet and other recreational activities restrictions would all provide benefits in terms
30 of species protection. As there would still be some opportunity for recreational use to come in contact
31 with and impact the species, impacts would be long-term, minor adverse.

32 **Cumulative Impacts.** The same past, present, and future actions discussed under the cumulative impact
33 scenario for alternative A would occur under alternative C. The overall cumulative impact of these past,
34 current and future actions, would be long-term negligible to minor, depending on the intensity and
35 duration of unpredictable factors such as storm events, with long-term moderate beneficial impacts from
36 actions such as increased interpretive programs as part of the long-range interpretive plan and predator
37 management within the Seashore. Many of these actions do not directly impact piping plover habitat in
38 the area, as most of this habitat is located within the Seashore and is impacted by NPS management
39 actions more than any of the aforementioned past, present, and future actions. These impacts, combined
40 with the long-term minor adverse, as well as minor to moderate beneficial impacts of alternative C, would
41 be long-term, minor adverse impacts, as actions within the Seashore would act as a driver for overall
42 cumulative impact.

43 **Conclusion.** Overall impacts under alternative C from resource management activities would be long-
44 term moderate beneficial. As with alternative B, some level of adverse impact would occur from human
45 presence during monitoring activities, but on the whole the establishment of SMAs early in the breeding

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1 season, monitoring activities, and establishment of large buffers would provide long-term moderate
 2 beneficial impacts to the species. Overall impacts under alternative C from ORV and other recreational
 3 use would be long-term minor adverse. The establishment of the SMAs which proactively preclude
 4 recreational use early in the breeding season, permit requirements, seasonal night driving restriction, and
 5 pet and other recreational activities restrictions would all provide benefits in terms of species protection.
 6 As there would still be some opportunity for recreational use to come in contact with and impact the
 7 species, impacts would be long-term, minor adverse.

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8 Cumulative impacts under alternative C would be long-term minor adverse.

Comment [bdm30]: Delete second???

9 Impairment to the piping plover would not occur under alternative C because ... EQD to provide

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10 **Determination of Effect.** Under the ESA the actions taken under alternative C may affect / are likely to
 11 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and the
 12 moderately beneficial impacts from the early establishment of pre-nesting closures, including the
 13 establishment of SMAs that would proactively close certain areas to recreational use prior to the
 14 beginning of the breeding season. ORV use and pedestrian access would result in long-term minor to
 15 moderate adverse impacts as the SMAs and larger buffers would reduce pressure from recreational uses
 16 on plovers. However, recreational uses would still occur in the vicinity of plovers during breeding season.
 17 Restricting ORV use at night from May 1 to November 15 would offer a higher level of protection than
 18 alternatives A and B and would have long-term moderate benefits to foraging plovers. These impacts
 19 would result in a finding of may affect/ are likely to adversely affect piping plovers under the ESA
 20 because the action would result in direct or indirect impacts to the species that are not discountable,
 21 insignificant, or beneficial. And while there may be beneficial impacts from monitoring, surveying and
 22 management of recreation, the actions under alternative C would also likely cause some adverse effects.

23 Impacts of Alternative D: Increased Predictability and Simplified Management

24 Resource Management Activities

25 *Establishment of Seasonal Closures.* Alternative D establishes SMAs for resource protection that would
 26 prohibit ORV use year-round within these areas. Under alternative D, all SMAs would be managed under
 27 ML1 procedures and would provide long-term major benefits to the species.

28 *Surveying and Monitoring.* Surveying and monitoring protocols during pre-nesting, courtship/mating,
 29 and nesting, and chick rearing life stages as well as surveys and monitoring for unfledged chick
 30 movement, adult foraging, and non-breeding stages is largely similar to the alternative C. However, under
 31 alternative D, ML1 procedures would be implemented year-round resulting in a reduction in the
 32 frequency of monitoring required compared to alternatives that either do not designate any SMAs or those
 33 that employ ML2 procedures and therefore require more frequent monitoring. Under alternative D's ML1
 34 procedures, all SMAs containing piping plover habitat would be closed to public access throughout the
 35 breeding season.

36 Because the frequency of monitoring would be reduced under alternative D, the impacts from surveying
 37 and monitoring, such as disturbance to piping plover at various life stages would also be reduced.
 38 Monitoring and surveying would result in minor to moderate, beneficial impacts to piping plover by
 39 providing park managers with information on habitats used by breeding and non-breeding piping plovers
 40 and the locations of those habitats, as well as potential threats they may contain. Surveying and
 41 monitoring would increase knowledge on how and when piping plover use the park and thereby enable
 42 adaptive management initiatives, providing a beneficial impact. However, as with the all the alternatives,
 43 surveying and monitoring would bring people and/or essential vehicles into direct, short-term contact with

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1 piping plovers and their habitat, and these activities themselves are known risk factors, especially during
 2 the more sensitive life stages of early pre-nesting and territory establishment. Under alternative D, many
 3 precautions would be taken by staff to minimize impacts from monitoring such as using high powered
 4 scopes and thereby reducing impacts from intrusion by monitors. The impact of the monitoring when
 5 these precautions are taken into consideration would be minor. Although there would be adverse impacts
 6 such as disturbance to piping plover at various life stages, the protection that would result from surveying
 7 would result in long-term, moderate, beneficial impacts.

8 *Buffer/Closure Establishment.* Under alternative D, ML1 procedures would be implemented at all SMAs
 9 year-round including Bodie Island Spit, Cape Point, and South Point Ocracoke, which would preclude all
 10 public access throughout the breeding season. ML1 procedures measures designate 75-meter buffers
 11 around any piping plover nests, ~~nest and~~ scrapes, and around any piping plover exhibiting breeding
 12 behavior. ML1 procedures provides 1,000-meter buffers for both ORVs and pedestrians around unfledged
 13 chicks, as opposed to ML2 procedures that reduce this to 300-meters for pedestrians. Because buffers
 14 under ML1 procedures are larger and in the case of alternative D in place year-round in the SMAs, there
 15 would be less monitoring required resulting in fewer changes in closure fencing by Seashore Park staff.
 16 Piping plovers would likely experience moderate to major long term benefits from the size and duration
 17 of the closures and from the fact that buffers would adjust in response to chick mobility under ML1
 18 procedures.

Comment [bdm31]: Delete. I don't think we want to include this. We can't put a closure around a PIPL doing aerial displays. Delete?

19 In addition, the closure of all SMAs to public access during the breeding season, alternative D provides
 20 for protection of piping plover nests through the use of buffer distances recommended, in part, under the
 21 Piping Plover Recovery Plan (USFWS 1996a) as described under alternative C. ~~In the event that~~ if piping
 22 plover breeding activity occurs outside of the SMAs, ~~could result in~~ adverse impacts ~~could result~~ to
 23 piping plover if implementation or adjustments to a buffer are not made in a timely manner, an outcome
 24 that may be more likely under the reduced monitoring inherent under alternative D and ML1 procedures,
 25 or if nests or acts of deliberate disturbance are missed by NPS Park staff.

26 Management conducted during pre-~~and post~~-nesting, ~~and~~ nesting, and chick rearing life stages would
 27 bring people and/or essential vehicles into direct, long-term contact with piping plover and their habitat,
 28 and these activities themselves are known risk factors, especially during the sensitive, early life stages of
 29 pre-nesting and territory establishment. However, management would also result in providing appropriate
 30 protection to piping plover during these early stages of the annual nesting cycle that would otherwise
 31 expose piping plover to disturbances from a variety of activities that might do them far more harm and/or
 32 result in abandonment.

33 Under alternative D designated SMAs would be subject to periodic review, as described under alternative
 34 C, resulting in long-term moderate beneficial impacts.

35 Overall, the benefit of the preclusion of all public access in SMA areas would outweigh the disturbance
 36 inherent with species management, and result in long-term moderate to major beneficial impacts from
 37 species closures and buffers.

38 *Management of Wintering/Non-breeding Populations.* Management of wintering/non-breeding
 39 populations under alternative D would be the same as those under alternative C, resulting in long-term
 40 moderate beneficial impacts.

41 *Education and Outreach.* Under alternative D, impacts as a result of education and outreach, including
 42 education from a permit system, would be the same as those under alternative C and would result in long-
 43 term minor to moderate beneficial impacts.

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1 *Overall Impacts of Resource Management Activities.* Overall impacts from field activities under
 2 alternative D to piping plover would be long-term moderate to major beneficial. As with all species
 3 management activities, some level of adverse impact would occur from human presence during
 4 monitoring activities, but on the whole the establishment of large year-round SMAs early in the breeding
 5 season, monitoring activities, and establishment of large buffers would provide long-term moderate to
 6 major beneficial impacts to the species.

7 **ORV and Other Recreational Use**

8 *ORV and Pedestrian Access.* Alternative D is designed to provide visitors to the Seashore with the
 9 maximum amount of predictability regarding routes available for ORV use and vehicle-free areas for
 10 pedestrian use, which means establishing year-round ORV route and non-ORV area designations. Under
 11 this alternative, year-round vehicle-free areas would include the area in front of villages and lifeguarded
 12 beaches as well as all SMA areas, which include the points and spits. Approximately 27.2 miles of
 13 shoreline would be open year-round to ORV use and pedestrian access and approximately 40.8 miles
 14 would be open to pedestrian access use, except for the SMAs during breeding season and potentially other
 15 locations outside the SMAs if breeding activity occurs. There would be seasonally designated ORV
 16 routes. In designated ORV areas, the speed limit would be 15 mph unless otherwise posted and permits
 17 would be required for all ORVs. Other uses would still be allowed in these vehicle-free areas outside of
 18 any identified resource closures/SMAs.

19 The restriction on large, contiguous areas, including all points and spits, under alternative D would
 20 provide long-term, moderate to major beneficial impacts to the piping plover (as described above under
 21 closure/buffer establishment) with greater benefits with lower levels of non-compliance, since these
 22 restrictions would essentially eliminate a conduit or access way for ORVs and pedestrians in these
 23 sensitive areas. Disturbance from direct, short-term contact with people and/or essential vehicles should
 24 be greatly reduced compared to alternatives A, B, and C, because of the amount of Seashore that is in
 25 year-round ORV closures, the ORV restriction on all points and spits, which are primary breeding and
 26 foraging areas for the piping plover, and the closure to pedestrians in all SMAs during the breeding
 27 season. Compliance with closures would be an enforcement issue for the NPS, although with the
 28 size/length of the non-ORV areas, non-compliance would be much less likely, and enforcement could be
 29 more concentrated in just a few areas. It is recognized that compliance would still be less than absolute,
 30 with a potential for short-term adverse impacts, but overall alternative D would provide benefits to the
 31 species. Due to the beneficial impacts from species management, adverse impacts from recreational use
 32 would be expected to be long-term minor adverse.

33 *Night-driving Restrictions.* Under alternative D, night driving of all nonessential ORV traffic would be
 34 the same as under alternative C and would result in long-term, moderate, beneficial impacts as it would
 35 further reduce the potential for disturbance to night-foraging chicks that could result in mortality,
 36 although foraging of piping plover chicks outside of the SMAs is unlikely.

37 *Commercial Fishing.* Commercial fishing activities under alternative D would be the same as alternative
 38 C and would result in long-term negligible adverse impact, with long-term minor to moderate benefits
 39 from night-driving restrictions.

40 *Permit Carrying Capacity Requirements.* As described under night-driving restrictions and education,
 41 alternative D would require a permit for ORV use, which includes night-driving. As stated in these
 42 sections previously, the result of the education provided by the permit and the restriction on night driving,
 43 ~~there would result in~~ long-term minor to moderate benefits from the species protection offered from
 44 these elements. There would be no impacts related to carrying capacity, as described under alternative A.

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1 *Pets/Other Recreational Activity Requirements.* Pets would be prohibited within all SMAs year-round.
 2 Camping would not be permitted at the Seashore, and beach fires would be regulated with a non-fee
 3 educational permit, as described under alternative C. Prohibition of pets within the SMAs year-round and
 4 additional education from a beach fire permit would be expected to have long-term minor to moderate
 5 beneficial impacts to the species, greater than those under alternative C, provided the level of non-
 6 compliance is kept low.

7 *Overall Impacts from ORV and Other Recreational Use.* Overall impacts under alternative C from
 8 recreation and other activities would be long-term minor adverse. The establishment of year-round SMAs
 9 under MLI procedures would proactively preclude recreational use early in the breeding season from
 10 large areas of the Seashore. This protection, combined with permit requirements, seasonal night driving
 11 restriction, and pet and other recreational activities restrictions would all provide benefits in terms of
 12 species protection. As there would still be some opportunity for recreational use to come in contact with
 13 and impact the species, impacts would be long-term, minor adverse.

14 **Cumulative Impacts.** The same past, present, and future actions discussed under the cumulative impact
 15 scenario for alternative A would occur under alternative D. The overall cumulative impact of these past,
 16 current and future actions, would be long-term negligible to minor, depending on the intensity and
 17 duration of unpredictable factors such as storm events, with long-term moderate beneficial impacts from
 18 actions such as increased interpretive programs as part of the long-range interpretive plan and predator
 19 management within the Seashore. Many of these actions do not directly impact piping plover habitat in
 20 the area, as most of this habitat is located within the Seashore and is impacted by NPS management
 21 actions more than any of the aforementioned past, present, and future actions. These impacts, combined
 22 with the long-term minor adverse, as well as minor to major beneficial impacts of alternative D, would be
 23 long-term, minor adverse impacts, as actions within the Seashore would act as a driver for overall
 24 cumulative impacts.

25 **Conclusion.** Overall impacts from resource management activities under alternative D to piping plover
 26 would be long-term moderate to major beneficial. As with all species management activities, some level
 27 of adverse impact would occur from human presence during monitoring activities, but on the whole the
 28 establishment of large year-round SMAs early in the breeding season, monitoring activities, and
 29 establishment of large buffers would provide long-term moderate to major beneficial impacts to the
 30 species. Overall impacts under alternative C from ORV and other recreational use would be long-term
 31 minor adverse. The establishment of year-round SMAs under MLI procedures would proactively
 32 preclude recreational use early in the breeding season from large areas of the Seashore. This protection,
 33 combined with permit requirements, seasonal night driving restriction, and pet and other recreational
 34 activities restrictions would all provide benefits in terms of species protection. As there would still be
 35 some opportunity for recreational use to come in contact with and impact the species, impacts would be
 36 long-term, minor adverse.

37 Cumulative impacts would be long-term, minor adverse.

38 Impairment to the piping plover would not occur under alternative D because ... EQD to provide

39 **Determination of Effect.** Under the ESA the actions taken under alternative D may affect / are likely to
 40 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and the
 41 moderately beneficial impacts from the early establishment of pre-nesting closures, including the
 42 establishment of SMAs that would be closed year-round and managed as MLI, resulting in closures to the
 43 public access during the breeding season in all SMAs. ORV use and pedestrian access would result in
 44 long-term minor to moderate adverse impacts as the SMAs and larger buffers would reduce pressure from
 45 recreational uses on plovers. However, recreational uses would still occur in the vicinity of plovers during

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1 breeding season. Restricting ORV use at night from May 1 to November 15 would offer a higher level of
 2 protection than alternatives A and B and would have long-term moderate benefits to foraging plovers.
 3 These impacts would result in a finding of may affect/ are likely to adversely affect piping plovers under
 4 ESA because the action would result in direct or indirect impacts to the species that are not discountable,
 5 insignificant, or beneficial. And while there may be beneficial impacts from monitoring, surveying and
 6 management of recreation, the actions under alternative D would also likely cause some adverse effects.

7 **Impacts of Alternative E: Variable Access and Maximum Management**8 **Resource Management Activities**

9 *Establishment of Seasonal Closures.* Alternative E establishes SMAs for resource protection. Each SMA
 10 would be managed under ML1 or ML2, as described under alternative C. However, under alternative E,
 11 SMAs under ML1 would be closed to ORV use from March 15 through August 31 and Bodie Island spit,
 12 Cape Point, and South Point Ocracoke would be managed under ML2, including establishment of an
 13 ORV pass-through zone at the start of the breeding season, which would be subject to resource closures if
 14 necessary. Establishment of these SMAs ~~areas~~ early in the breeding season would have long-term
 15 moderate benefits to piping plover.

16 *Surveying and Monitoring.* ~~Surveying and monitoring protocols during pre-nesting and~~
 17 ~~courtship/mating, and~~ nesting, life stages as well as surveys and monitoring for unfledged chick
 18 movement, adult foraging, and non-breeding stages would be the same as alternative C. Protected species
 19 buffers would follow ML1 procedures at most areas of the Seashore, with the exception of Bodie Island
 20 Spit, Cape Point, and South Point, where ML2 procedures would apply. Because surveying and
 21 monitoring protocols would be the same as alternative C, these protocols would result in long-term
 22 moderate, beneficial impacts to piping plovers by providing park managers with information on types of
 23 habitats used by non-breeding piping plovers, seasons, times of day used, and the locations of those
 24 habitats as well as potential threats they may contain. Surveying would increase knowledge on how and
 25 when piping plovers use the park and enable adaptive management initiatives.

26 As with ~~the~~ all the alternatives, surveying and monitoring would bring people and/or essential vehicles
 27 into direct, short-term contact with piping plovers and their habitat, and these activities themselves are
 28 known risk factors, especially during the more sensitive life stages of early pre-nesting and territory
 29 establishment. Under alternative E, like alternative C, many precautions would be taken by staff to
 30 minimize impacts from monitoring, such as using high powered scopes, thereby reducing impacts from
 31 intrusion by monitors. The impact of the monitoring when these precautions are considered would be
 32 minor. Although there would be adverse impacts such as disturbance to piping plover at various life
 33 stages, the protection that would result from surveying would result in long-term, moderate, beneficial
 34 impacts.

35 *Buffer Closure Establishment.* Under alternative E, SMAs would be established and the level of species
 36 management designated either ML1 or ML2. ML1 procedures would not allow ORV or pedestrian access
 37 when pre-nesting closures are in effect. Bodie Island Spit, Cape Point, and South Point Ocracoke would
 38 be managed under ML2 procedures and would include a narrow ORV access corridor (where ORV use
 39 permitted) or a pedestrian access corridor at the start of the breeding season; that would be subject to
 40 resource closures if necessary. ML1 procedures designate 75 m buffers around any piping plover nests ~~or~~
 41 ~~nest scrapes and around any piping plover exhibiting breeding behavior.~~ ML1 procedures provide 1,000-
 42 meter buffers for both ORVs and pedestrians around unfledged chicks, as opposed to ML2 procedures
 43 that reduce this to 300 m for pedestrians. Because buffers under ML1 procedures are larger, there would
 44 be less monitoring required resulting in fewer changes in closure fencing by ~~Seashore Park~~ staff. Piping

Comment [bdm32]: Are we going to guarantee this? What if there was a PIPL nest or even an AMOY nest the previous year that would preclude the establishment of an ORV pass-through zone. Recommend "including possible establishment..."

Comment [bdm33]: Use same verbage as used previously.

Comment [bdm34]: Utilize wording from Pg 29, line 25-26.

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1 plovers would likely experience moderate, long-term benefits from the size and duration of the closures
2 and from the fact that buffers would adjust in response to chick mobility under ML1 procedures.

3 Like alternative C, in addition to pre-nesting areas and the general reduction in recreational pressure
4 provided by the SMAs, alternative E would provide for protection of piping plover nests outside of the
5 SMAs through the use of buffer distances described under alternative C. Although the species would be
6 offered protection by these buffers, short-term adverse impacts could result to piping plover if
7 adjustments to a buffer are not made in a timely manner or if nests or acts of deliberate disturbance are
8 missed by NPS Park staff outside of the SMAs areas. Therefore, the buffers under alternative E would be
9 expected to have long-term, moderate, beneficial effects on the species because the benefits outweigh the
10 adverse effects and as with surveying/monitoring. Alternative E would also include periodic review, as
11 described under alternative C, providing additional beneficial impacts for the species.

12 *Management of Wintering/Non-breeding Populations.* Under alternative E, as described under alternatives
13 C and D, SMAs would be established for migrating/wintering shorebirds at various locations throughout
14 the Seashore. Closures would be established no later than when breeding season closures are removed at
15 the same location(s), resulting in long-term moderate beneficial impacts from this protection.

16 Nonbreeding resource closures would be established at the ~~points and spits~~ and Cape Point based on
17 habitat used by wintering piping plovers more than one of the past five years, the presence of birds at the
18 beginning of the migratory season, and suitable habitat types based on the results of the annual habitat
19 assessment. In addition to nonbreeding resource closures, NPS would establish non-ORVs areas along the
20 ocean shoreline to provide less disturbed foraging, resting, and roosting areas for migrating and wintering
21 shorebirds.

22 *Education and Outreach.* Under alternative E, impacts as a result of education and outreach, including
23 education from a permit system, would be the same as those under alternative C and would result in long-
24 term minor to moderate beneficial impacts.

25 *Overall Impacts of Resource Management Activities.* Overall impacts under alternative E from surveying
26 and field activities would be long-term moderate beneficial. As with all species management activities,
27 some level of adverse impact would occur from human presence during monitoring activities, but on the
28 whole the establishment of SMAs early in the breeding season, monitoring activities, and establishment
29 of large buffers would provide long-term moderate beneficial impacts to the species.

30 **ORV and Other Recreational Use**

31 *ORV and Pedestrian Access.* Under alternative E, approximately 27.4 miles of shoreline would be open
32 year-round to ORV use, approximately 26.1 miles would be open to seasonal ORV use from September 1
33 through March 14; and approximately 14.5 miles would be closed to ORV use. The speed limit would be
34 15 mph unless otherwise posted and permits would be required for all ORVs. In three SMAs, under ML2
35 procedures, adjacent to the pre-nesting area NPS would provide an ORV corridor with a pass through
36 zone at the start of the breeding season (March 15). When breeding activity is observed, standard buffers
37 would apply, which depending upon the circumstances could close the access corridor until breeding
38 activity has concluded.

39 The designation of SMAs and other restrictions under alternative E would reduce the potential of
40 disturbance and nest abandonment from direct, short-term contact with people and/or essential vehicles
41 compared to alternatives A and B, but would have greater impacts than alternative C due to the possible
42 existence of an ORV pass-through at three SMAs managed under ML2 procedures, which would create a
43 conduit to the points and spits for ORVs, and a reduction in the length of ORV closures in SMAs

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1 managed under MLI procedures from October 14 under alternative C to August 31 under alternative E.
 2 Impacts would also be greater under alternative E than alternative D, which has all SMAs closed to ORV
 3 and pedestrian use during the breeding season. As described under alternatives A, B, and C, these
 4 measures should limit adverse impacts to piping plover; however, compliance with closures may not be
 5 absolute, and there would be access to the points and spits ~~and the closed areas~~ and the closed areas are not
 6 expansive or contiguous, resulting in short-term adverse impacts if non-compliance occurs. Although the
 7 large SMAs would be beneficial to the species, continued recreation use in this area would still result in
 8 potential long-term minor to moderate adverse impacts to the species, which would be greater than those
 9 impacts under alternative C because of the increased access.

10 *Night-driving Restrictions.* Under alternative E, night driving of all nonessential ORV traffic would be
 11 similar to alternative B and would result in long-term minor to moderate beneficial impacts because it
 12 would reduce the potential for disturbance to ~~night-foraging chicks and adults foraging at night~~ night-foraging chicks and adults foraging at night that could
 13 result in mortality, but would still allow night driving until 10:00 p.m., which would be after dark and
 14 could still result in some level of impact.

15 *Commercial Fishing.* Management of commercial fishing under alternative E would be the same as
 16 alternative C resulting in long-term negligible adverse impacts from the presence of commercial fishing
 17 vehicles, with long-term minor to moderate benefits from night-driving restrictions.

18 *Permit/Carrying Capacity.* As described under night-driving restrictions and education, alternative E
 19 would require a permit for ORV use, which would include night-driving. As stated in these sections, the
 20 result of the education provided by the permit and the restriction on night driving, ~~there would result in~~
 21 long-term minor to moderate benefits from the species protection offered from these elements. There
 22 would be no impacts related to carrying capacity, as described under alternative C.

23 *Pets/Other Recreational Activities.* Pets would be prohibited within all SMAs and are prohibited from
 24 ORV access corridors during pre-nesting, as described under alternative C, with the seasonal prohibition
 25 dates adjusted to March 15 to August 31. As with alternative C, an educational permit would be required
 26 for any beach fire year round, which would inform visitors about species protection issues related to this
 27 recreational use.

28 Camping restrictions would be the same as alternative C, however, park-and-stay permits for overnight
 29 beach use would be issued at selected spits and points that are not closed for resource protection. The
 30 provision for park-and-stay overnight at some spits and points during portions of the breeding season
 31 when resource closures do not preclude access would increase the potential for human disturbance in
 32 nesting adjacent to those locations.

33 The ~~pet~~ pet restrictions would result in long-term minor to moderate benefits to species at the Seashore,
 34 further reducing pressure to piping plover from ~~recreational-unrestrained pet~~ recreational-unrestrained pet activity, with the potential
 35 for long-term minor to moderate adverse impacts from the park-and-stay option, which would occur
 36 outside of resource closures.

37 *Overall Impacts from ORV and Other Recreational Use.* Overall impacts under alternative E from
 38 recreation and other activities would be long-term minor to moderate adverse. The establishment of the
 39 SMAs which proactively preclude recreational use early in the breeding season, permit requirements, and
 40 pet and other recreational activities restrictions would all provide benefits in terms of species protection.
 41 Although there would be benefits from seasonal night driving restrictions, they would not be as great as
 42 other action alternatives because driving after dark (until 10:00 pm) would still be occurring, even during
 43 seasonal restrictions. The potential for adverse impacts also would exist from additional camping options

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1 under this alternative. As there would still be some opportunity for recreational use to come in contact
2 with and impact the species, impacts would be long-term, minor to moderate adverse.

3 **Cumulative Impacts.** The same past, present, and future actions discussed under the cumulative impact
4 scenario for alternative A would occur under alternative E. The overall cumulative impact of these past,
5 current and future actions, would be long-term negligible to minor, depending on the intensity and
6 duration of unpredictable factors such as storm events, with long-term moderate beneficial impacts from
7 actions such as increased interpretive programs as part of the long-range interpretive plan and predator
8 management within the Seashore. Many of these actions do not directly impact piping plover habitat in
9 the area, as most of this habitat is located within the Seashore and is impacted by NPS management
10 actions more than any of the aforementioned past, present, and future actions. These impacts, combined
11 with the long-term minor to moderate adverse, as well as minor to moderate beneficial impacts of
12 alternative E, would be long-term, minor to moderate adverse impacts, as actions within the Seashore
13 would act as a driver for overall cumulative impact.

14 **Conclusion.** Overall impacts under alternative E from resource management activities would be long-
15 term moderate beneficial. As with all species management activities, some level of adverse impact would
16 occur from human presence during monitoring activities, but on the whole the establishment of SMAs
17 early in the breeding season, monitoring activities, and establishment of large buffers would provide long-
18 term moderate beneficial impacts to the species. Overall impacts under alternative E from ORV and other
19 recreational use would be long-term minor to moderate adverse. The establishment of the SMAs which
20 proactively preclude recreational use early in the breeding season, permit requirements, and pet and other
21 recreational activities restrictions would all provide benefits in terms of species protection. Although
22 there would be benefits from seasonal night driving restrictions, they would not be as great as other action
23 alternatives because driving after dark (until 10:00 pm) would still occurring, even during seasonal
24 restrictions. The potential for adverse impacts also would exist from additional camping options under
25 this alternative. As there would still be some opportunity for recreational use to come in contact with and
26 impact the species, impacts would be long-term, minor to moderate adverse.

27 ~~Cumulative impacts under alternative E would be long-term minor to moderate adverse.~~

28 ~~Impairment to the piping plover would not occur under alternative E because ... EQD to provide~~

29 **Determination of Effect** Under the ESA the actions taken under alternative E may affect / are likely to
30 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and the
31 moderately beneficial impacts from the establishment of SMAs for resource protection. Each SMA would
32 be managed as either ML1 (management with larger, longer lasting buffers with less monitoring and
33 closures to all ORV and pedestrian access when in effect) or ML2 (management with smaller buffers that
34 require more frequent monitoring). Areas under ML2 procedures would accommodate a narrow ORV
35 access corridor (where ORV use permitted) or a pedestrian access corridor (where ORV use is not
36 permitted). However, under alternative E, SMAs would be closed to ORV use from March 15 through
37 August 31 and Bodie Island spit, Cape Point, and South Point Ocracoke would be under ML2 procedures
38 and would include an ORV pass-through zone. Establishment of these SMA areas early in the breeding
39 season would have long-term moderate benefits to piping plover. However, recreational uses would still
40 occur in the vicinity of plovers during breeding season. All recreational ORV traffic would be prohibited
41 at night ~~in these areas: ocean intertidal zone, ocean back shore, and dunes,~~ from 10 p.m. until 6 a.m. from
42 May 1 to September 15. From September 16 to November 15, night driving permits would be available
43 for authorized nonessential driving between the hours of 10 p.m. and 6 a.m. These restrictions to night
44 driving would provide long-term minor to moderate benefits to piping plovers but could still result in
45 long-term, minor, adverse impacts during the time when night-driving is allowed by permit. These
46 impacts would result in a finding of may affect/ are likely to adversely affect piping plovers under ESA

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1 because the action would result in direct or indirect impacts to the species that are not discountable,
 2 insignificant, or beneficial. And while there may be beneficial impacts from monitoring, surveying and
 3 management of recreation, the actions under alternative E would also likely cause some adverse effects.

4 **Impacts of Alternative F: Management Based on Advisory Committee Input**

5 **Resource Management Activities**

6 *Establishment of Seasonal Closures.* As with alternative C, alternative F establishes SMAs for resource
 7 protection. However, under alternative E, SMAs would be closed to ORV use from March 15 through
 8 July 31, or two weeks after all the chicks in the area have fledged (whichever comes later), for all
 9 seasonal areas, except for 0.5 miles SW of Ramp 68 to 1.2 miles northeast of Ramp 70, which would be
 10 closed to ORVs through October 31. Establishment of these SMA areas early in the breeding season
 11 would have long-term moderate benefits to piping plover.

Comment [bdm35]: F???

12 *Surveying and Monitoring.* ~~Surveying and monitoring protocols during pre-nesting, courtship/mating,~~
 13 ~~and nesting, and chick rearing life stages as well as surveys and monitoring for unfledged chick~~
 14 ~~movement, adult foraging, and non-breeding stages is~~ are the same as alternative C and E. Surveying and
 15 monitoring during all life stages, as described under alternatives C and E, would bring people and/or
 16 essential vehicles into direct, short-term contact with piping plovers and their habitat, and these activities
 17 themselves are known risk factors, especially during the more sensitive life stages of early pre-nesting and
 18 territory establishment. However, because many precautions would be taken by staff to minimize impacts,
 19 (for example, using scopes to watch the birds from a distance and remaining outside closures to the extent
 20 possible), the protection that results from surveying may result in long-term moderate beneficial impacts.

21 Under alternative F, species management would be the same as alternative C, with the exception of the
 22 establishment of ORV or pedestrian corridors in the three SMAs, managed under ML2 procedures.
 23 Overall, the pre-breeding ~~surveying~~ and post-breeding ~~monitoring~~ ~~surveying~~ and management actions
 24 proposed under alternative F would have a long term, moderate, beneficial impact, providing the Seashore
 25 with additional data and information for effective and adaptive piping plover management. Some surveys
 26 ~~ing~~ and management actions would expose piping plover to risk factors due to the need to place people
 27 and essential vehicles in close proximity to plovers, but these effects would be short-term and of
 28 relatively low impact, because resource staff would ~~avoid entering closures~~ ~~minimize disturbance~~ and use
 29 appropriate discretion. Overall, ~~surveys ing actions~~ under alternative F, would provide long-term
 30 moderate benefits and only short-term opportunities for disturbance.

31 *Buffer Closure Establishment.* Alternative F would establish SMAs for resource protection, as described
 32 for alternative C. Unlike alternative C, four SMAs would be closed to ORVs year-round, including
 33 Hatteras Inlet Spit and North Ocracoke Spit. Cape Point and South Point would be managed under ML2
 34 procedures, like alternative C, but would include an ORV limited access corridor in these areas (subject
 35 to resource closures) from March 15 to July 31. Within these areas, as well as throughout other areas of
 36 the Seashore not included in an SMA, buffers for species protection would be established as described for
 37 alternative C. Piping plovers would likely experience long-term moderate benefits from the size of the
 38 resource closures under ML1 and ML2 procedures and the fact that buffers would adjust in response to
 39 chick mobility, as these action would be expected to improve the sustainability of the species at the
 40 Seashore.

41 Management conducted during pre-nesting and nesting life stages would bring people and/or essential
 42 vehicles into direct, long-term contact with piping plover and their habitat, and these activities themselves
 43 are known risk factors, especially during the sensitive, early life stages of pre-nesting and territory
 44 establishment. However, management also results in providing appropriate protection to piping plover

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1 during these early stages of the annual nesting cycle that would otherwise expose piping plover to
2 disturbances from a variety of activities that might do them far more harm and/or result in abandonment.
3 Hence, and on balance, management provides long-term, minor to moderate, beneficial impacts to piping
4 under alternative F. As with alternative C, all designated SMAs would be subject to Periodic Review,
5 which would have long-term moderate beneficial impacts.

6 *Management of Wintering/Nonbreeding Populations.* Management of wintering/non-breeding populations
7 under alternative F would include the measures described under alternative C. In addition, a total of four
8 miles of ocean shoreline would be considered "floating" closures and would be closed to ORVs during
9 the non-breeding season. These "floating" closures would be determined each year based on the best
10 available habitat for non-breeding use. These measures would result in long-term, moderate, beneficial
11 impacts to non-breeding piping plover that would be greater than those under the other action alternatives.

12 *Education and Outreach:* Under alternative F, education and outreach activities would be the same as
13 those described under alternative A, with the addition of educational requirements as part of a permit
14 program. This additional education would result in long-term minor to moderate benefits to species as the
15 public is provided with more information regarding this issue.

16 *Overall Impacts from Resource Management Activities:* Overall impacts under alternative F from
17 surveying and field activities would be long-term moderate beneficial. As with all species management
18 activities, some level of adverse impact would occur from human presence during monitoring activities,
19 but on the whole the establishment of SMAs early in the breeding season, monitoring activities, and
20 establishment of large buffers would provide long-term moderate beneficial impacts to the species. Long-
21 term moderate benefits to non-breeding populations would be greater under alternative F than other action
22 alternatives because of the addition of four miles of non-breeding closures.

23 **ORV and Other Recreational Use**

24 *ORV and Pedestrian Access.* Under alternative F, Seashore visitors would be provided with a degree of
25 predictability regarding areas available for ORV use, as well as vehicle-free areas, based largely on the
26 seasonal resource and visitor use characteristics of various areas in the park. Under alternative F,
27 approximately 26.2 miles of shoreline would be open year-round to ORV use, approximately 25.8 miles
28 would be open to seasonal ORV use from August 1 through March 14 (one area from November 1
29 through March 14); and approximately 16.0 miles would be closed to ORV use. The speed limit would be
30 15 mph unless otherwise posted and permits would be required for all ORVs. Two areas of seasonal ORV
31 use (managed under ML2 procedures) would maintain an ORV corridor from March 15 to July 31 and
32 one area would maintain a pedestrian corridor from March 15 through July 31 or 2 weeks after fledging.
33 Establishment of SMAs would reduce pressure from recreational activities on piping plover. Under
34 alternative F, this reduction in pressure would be similar to alternative E and greater than alternatives A
35 and B, but less than C and D which close larger and more contiguous areas of habitat for longer periods of
36 time.

SMAs

Comment [bdm36]: Cape Point and South Point? yes

Comment [bdm37]: Is this Bodie Island Spit? If it is why not state it.

Yes RES.

37 Like alternative E, alternative F would reduce the potential ~~for~~ disturbance and nest abandonment from
38 direct, short-term contact with people and/or essential vehicles compared to alternatives A and B, but
39 would have greater impacts than alternative C due to the existence of an ORV corridor in two SMAs
40 managed under ML2 procedures and a reduction in the length of ORV closure in other SMAs from
41 October 14 under alternative C to July 31 under alternative F. Although the designation of SMAs and the
42 other restrictions under alternative F should limit adverse impacts to piping plover, compliance with
43 closures may not be absolute, since alternative F still includes pedestrian access to Bodie Island Spit and a
44 conduit (ORV corridor) to Cape Point and South Point during the breeding season (all subject to resource
45 closures), and the areas closed are not expansive or contiguous. Therefore, recreational uses could result

Comment [bdm38]: I don't think spit was capitalized previously. Consistency.

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1 | in short-term minor to moderate adverse impact from ORVs especially if non-compliance occurs. Since
 2 | recreational activities would still occur, under alternative F impacts from ORV and pedestrian access to
 3 | piping plover would be long-term, minor to moderate adverse and would be greater than alternative C due
 4 | to increased access.

5 | *Night-driving restrictions.* Under alternative F, night driving of all nonessential ORV traffic would be
 6 | prohibited from all areas (other than the sound side access areas), from one hour after sunset until
 7 | approximately ½ hour after sunrise from May 1 to November 15. From November 16 to April 30, night
 8 | driving would be allowed 24 hours per day in designated ORV routes for vehicles with a valid ORV
 9 | permit. Furthermore, NPS retains the discretion to limit night driving to certain areas or routes, based on
 10 | resource protection considerations. Because plovers are known to be active at night (Staine and Burger
 11 | 1994; Majka and Shaffer 2008), and plover chick and fledgling response to vehicles can increase their
 12 | vulnerability to ORVs (USFWS 1996a), the high level of protection at night from May 1 to November 15
 13 | under alternative F would result in long-term moderate beneficial impacts because it would reduce the
 14 | potential for disturbance to chicks that could result in mortality.

15 | *Commercial Fishing.* Commercial fishing would be managed the same as under alternative C, with long-
 16 | term negligible adverse impacts from commercial fishing operations and long-term minor to moderate
 17 | benefits from night-driving restrictions.

18 | *Permits/Carrying Capacity.* As described under night-driving restrictions and education, alternative F
 19 | would require a permit for ORV use, which would include information on night-driving restrictions. As
 20 | stated in these sections, the result of the education provided by the permit and the restriction on night
 21 | driving, there would be long-term minor to moderate benefits from the species protection offered from
 22 | these elements. There would be no impacts related to carrying capacity, as described under alternative C.

23 | *Pets/Other Recreational Activity Restrictions.* Pets would be prohibited within all SMAs and restricted to
 24 | designated village beaches during the breeding season, which would greatly reduce the likelihood of pet
 25 | disturbance in piping plover breeding areas; however, compliance is needed to ensure that this reduces the
 26 | risk of impacts. Camping and beach fire restrictions would be the same as those under alternative C, with
 27 | the addition of restricting beach fires from May 1 to November 15 to Coquina Beach, Rodanthe, Waves,
 28 | Salvo, Avon, Buxton, Frisco, Hatteras Village, and Ocracoke Day-use area. These additional restrictions,
 29 | and limitation of pets to village beaches during the breeding season would result in long-term moderate
 30 | beneficial impacts to species at the Seashore as recreational pressures are further reduced.

31 | *Overall Impacts from ORV and Other Recreational Use:* Overall impacts under alternative F from
 32 | recreation and other activities would be long-term minor to moderate adverse. The establishment of the
 33 | SMAs which proactively preclude recreational use early in the breeding season, permit requirements, and
 34 | pet and other recreational activities restrictions would all provide benefits in terms of species protection.
 35 | As alternative F would provide for more flexible access to various areas of the Seashore, the potential for
 36 | disturbance to piping plover is increased over alternatives C and D, resulting in long-term minor to
 37 | moderate adverse impacts.

38 | **Cumulative Impacts.** The same past, present, and future actions discussed under the cumulative impact
 39 | scenario for alternative A would occur under alternative F. The overall cumulative impact of these past,
 40 | current and future actions, would be long-term negligible to minor, depending on the intensity and
 41 | duration of unpredictable factors such as storm events, with long-term moderate beneficial impacts from
 42 | actions such as increased interpretive programs as part of the long-range interpretive plan and predator
 43 | management within the Seashore. Many of these actions do not directly impact piping plover habitat in
 44 | the area, as most of this habitat is located within the Seashore and is impacted by NPS management
 45 | actions more than any of the aforementioned past, present, and future actions. These impacts, combined

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1 with the long-term minor to moderate adverse, as well as minor to moderate beneficial impacts of
 2 alternative F, would be long-term, minor to moderate adverse impacts, as actions within the Seashore
 3 would act as a driver for overall cumulative impact.

4 **Conclusion.** Overall impacts under alternative F from resource management activities would be long-
 5 term moderate beneficial. As with all species management activities, some level of adverse impact would
 6 occur from human presence during monitoring activities, but on the whole the establishment of SMAs
 7 early in the breeding season, monitoring activities, and establishment of large buffers would provide long-
 8 term moderate beneficial impacts to the species. Long-term moderate benefits to non-breeding
 9 populations would be greater under alternative F than other action alternatives because of the addition of
 10 four miles of non-breeding closures. Overall impacts under alternative F from ORV and other recreational
 11 use would be long-term minor to moderate adverse. The establishment of the SMAs which proactively
 12 preclude recreational use early in the breeding season, permit requirements, and pet and other recreational
 13 activities restrictions would all provide benefits in terms of species protection. As alternative F would
 14 provide for more flexible access to various areas of the Seashore, the potential for disturbance to piping
 15 plover is increased over alternatives C and D, resulting in long-term minor to moderate adverse impacts.

16 ~~Cumulative impacts would be long-term minor to moderate adverse.~~

17 Impairment to the piping plover would not occur under alternative F because ... EQD to provide

18 **Determination of Effect.** Under the ESA the actions taken under alternative F may affect / are likely to
 19 adversely affect piping plover due to the minor adverse effects from monitoring and surveying and the
 20 moderately beneficial impacts from the establishment of SMAs for resource protection. Under alternative
 21 F, SMAs would be closed to ORV use from March 15 through July 31 for all seasonal areas, except for
 22 0.5 miles southwest of Ramp 68 to 1.2 miles NE of Ramp 70, which would be closed to October 31.
 23 Establishment of these SMA areas early in the breeding season would have long-term moderate benefits
 24 to piping plover. Long-term major benefits would occur as SMAs would establish closures by March 15
 25 and would be in place to provide protection for migrating plover and plover establishing territories early
 26 arriving piping plover in the season. However, recreational uses would still occur in the vicinity of plovers
 27 during breeding season. Under alternative F, night driving of all nonessential ORV traffic would be
 28 prohibited from all areas (other than the sound side access areas), from one hour after sunset until
 29 approximately 1/2 hour after sunrise from May 1 to November 15. From November 16 to April 30, night
 30 driving would be allowed 24 hours per day in designated ORV routes for vehicle holding a valid ORV
 31 permit. NPS retains the discretion to limit night driving to certain areas or routes, based on resource
 32 protection considerations. These restrictions to night driving would provide long-term minor to moderate
 33 benefits to piping plovers but could still result in long-term, minor, adverse impacts during the time when
 34 night-driving is allowed by permit. These impacts would result in a finding of may affect/ are likely to
 35 adversely affect piping plovers under the ESA because the action would result in direct or indirect
 36 impacts to the species that are not discountable, insignificant, or beneficial. And while there may be
 37 beneficial impacts from surveys and monitoring, surveying and management of recreation, the actions
 38 under alternative F would also likely cause some adverse effects.

Preventive
 (F)

Comment [bdm39]: Use the same wording in all sections with this same statement.

39 **TABLE 45. SUMMARY OF IMPACTS TO PIPING PLOVER UNDER THE ALTERNATIVES**

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Resource Management Activities					
Establishment of Seasonal Closures					
Long-term minor to moderate adverse impacts would	Long-term moderate benefits would occur as closures would be	Long-term moderate benefits would occur as closures	Long-term major benefits would occur as	Long-term moderate benefits would occur as	Long-term moderate benefits would occur as

Comment [bdm40]: In general the table appears to focus on similarities and not on differences. The table should include both. Changes in text of the document should be reflected in the table as well.

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Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
occur to piping plover arriving before the April 1 pre-nesting closures due to the sensitivity of the species during this life stage, with long-term moderate benefits to those arriving after the seasonal closure is in place.	in place to provide protection for early arriving piping plover, migratory piping plovers and breeding territories.	would be in place to provide protection for early arriving piping plover, migratory piping plovers and breeding territories.	closures would be in place to provide protection for early arriving migratory piping plovers and breeding territories and as required of from all SMAs under ML1 procedures, would be closed to public access during the breeding season.	SMAs would establish closures by March 15 and would be in place to provide protection for early arriving piping plover, migratory piping plovers and breeding territories. This alternative would provide somewhat less protection than alternative D, as management under ML1 is not as expensive in the SMAs.	SMAs would establish closures by March 15 and would be in place to provide protection for early arriving piping plover.
Surveying and Monitoring					
Best practices would be implemented to reduce disturbance during surveying, resulting in long-term minor to moderate benefits to the species as surveying and monitoring would lead to the necessary management measures.	Intensive surveying and monitoring under alternative B would be expected to have long-term moderate beneficial impacts, as any changes in species behavior would be detected and appropriate management measures implemented.	Surveying and monitoring would be expected to have long-term moderate beneficial impacts, as these actions would improve the sustainability of the species at the Seashore.	Surveys and monitoring would be expected to have long-term moderate beneficial impacts, as these actions would improve the sustainability of the species at the Seashore.	Surveys and monitoring would be expected to have long-term moderate beneficial impacts, as these actions would improve the sustainability of the species at the Seashore.	Surveys and monitoring would be expected to have long-term moderate beneficial impacts, as these actions would improve the sustainability of the species at the Seashore.
Buffer/Closure Establishment					
Piping plovers would likely experience minor long-term benefits from the size of resource closures and observation intensity would adjust in response to chick behavior, but long-term moderate adverse impacts may occur as frequent adjustment of the buffers may result in additional disturbance to piping plover, and buffers that are not adjusted in a timely manner could result in less than optimal protection for the species.	Except for the potential disturbance caused by the once per week nest examination inspection, the larger and more responsive buffers under alternative B would be expected to have long-term, minor to moderate, beneficial effects	Establishment of SMAs and large buffer sizes, along with periodic review to ensure management is effective, would have long-term moderate beneficial impacts.	Overall, the benefit of the preclusion of all public access in SMA areas would outweigh the disturbance inherent with species management, and result in long-term moderate to major beneficial impacts from species closures and buffers. Benefits would also occur from a system of periodic review that would evaluate the SMAs for effectiveness.	Establishment of SMAs and large buffer sizes, along with periodic review to ensure management is effective, would have long-term moderate beneficial impacts.	Establishment of SMAs and large buffer sizes, along with periodic review to ensure management is effective, would have long-term moderate beneficial impacts.
Management of Wintering/Non-breeding Populations					

Comment [bdm41]: Not sure what you are trying to say-extensive? Need to compare with ML2?

Comment [bdm42]: Should include differences between alt B, C, E and F. All would have once per week nest inspections.

Comment [bdm43]: Should include ORV pass through zones

Comment [bdm44]: Should discuss the limited access ORV corridor at Cape Point and South Point

Comment [bdm45]: Should include any differences. See comments below.

needs to be in text for it

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Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Suitable interior habitats at spits and at Cape Point would be closed year-round to all recreational users and would provide for resting and foraging for all species, resulting in long-term minor beneficial impacts as this would represent an improvement to habitat during key life stages of the species.	Closing suitable interior habitats <u>ORVs and/or pedestrians</u> year-round at spits and Cape Point, as well as implementation of a SECN survey protocol would have long-term moderate beneficial impacts for piping plover.	Annual surveys and establishment of non-breeding SMAs would result in long-term moderate beneficial impacts.	Annual surveys and establishment of non-breeding SMAs would result in long-term moderate beneficial impacts.	Annual surveys and establishment of non-breeding SMAs would result in long-term moderate beneficial impacts.	Annual surveys and establishment of non-breeding SMAs would result in long-term moderate beneficial impacts.
Education and Outreach					
Education and outreach efforts under alternative A would aim to reduce non-compliance and further protect the species, resulting in long-term minor beneficial impacts.	Public outreach as part of species management would have long-term, minor, beneficial impacts, with the expanded outreach having greater impacts than alternative A.	Additional education would result in long-term minor to moderate benefits to species as the public is provided with more information regarding this issue.	Additional education would result in long-term minor to moderate benefits to species as the public is provided with more information regarding this issue.	Additional education would result in long-term minor to moderate benefits to species as the public is provided with more information regarding this issue.	Additional education would result in long-term minor to moderate benefits to species as the public is provided with more information regarding this issue.
Overall Impacts from Resource Management Activities					
Overall, impacts to piping plover from species surveying and field activities would be long-term minor to moderate adverse. Although the management of the species would provide a certain level of benefit, the manner in which buffers would be established, along with the need to adjust buffers frequently would have an adverse impact on the species.	Overall impacts under alternative B from species surveying and field activities would be long-term minor to moderate beneficial. Although the buffer establishment would have adverse impacts due to the size of the buffer, they would be more constant, larger, and provide more protection compared to alternative A and would have less of an adverse impacts. The benefits from the pre-nesting closures, along with the benefits from increased surveying and monitoring, would result in long-term minor to moderate beneficial impacts.	Overall impacts under alternative C from surveying and field activities would be long-term moderate beneficial. As with alternative B, some level of adverse impact would occur from human presence during monitoring activities, but on the whole the establishment of SMAs early in the breeding season, monitoring activities, and establishment of large buffers would provide long-term moderate beneficial impacts to the species.	Overall impacts under alternative D from surveying and field activities under alternative D to piping plover would be long-term moderate to major beneficial. As with all species management activities, some level of adverse impact would occur from human presence during monitoring activities, but on the whole the establishment of large year-round SMAs early in the breeding season, monitoring activities, and establishment of large buffers would provide long-term	Overall impacts under alternative E from surveying and field activities would be long-term moderate beneficial. As with all species management activities, some level of adverse impact would occur from human presence during monitoring activities, but on the whole the establishment of SMAs early in the breeding season, monitoring activities, and establishment of large buffers would provide long-term moderate beneficial impacts to the species.	Overall impacts under alternative F from surveying and field activities would be long-term moderate beneficial. As with all species management activities, some level of adverse impact would occur from human presence during monitoring activities, but on the whole the establishment of SMAs early in the breeding season, monitoring activities, and establishment of large buffers would provide long-term moderate beneficial impacts to the species. Long-term moderate benefits to non-breeding populations would be greater under alternative F than

Comment [bdm47]: Include 4 miles of floating closures.

Comment [bdm46]: NPS would establish non-ORVs areas along the ocean shoreline to provide less disturbed foraging, resting, and roosting areas for migrating and wintering shorebirds.

in Text

Comment [bdm48]: Discuss differences in SMAs and dates of closures etc.

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Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
			moderate to major beneficial impacts to the species.		other action alternatives because of the addition of four miles of <u>non-breeding floating</u> closures.
Recreation And Other Activities					
ORV and Pedestrian Access					
A lack of compliance with buffers and closures, including non-compliance (either intentional or non-intentional) due to variable buffer sizes, could result in short-term, moderate to major adverse impacts at a particular location, and would result in long-term, moderate adverse impacts if there is a chronic lack of compliance.	Given the increased level of monitoring at the key piping plover breeding areas and the significantly larger buffers when piping plover chicks are present, alternative B would offer more protection for the species from recreational use, but the potential for impacts from recreational use would still exist, resulting in long-term minor to moderate adverse impacts.	Establishment of SMAs and large buffer areas and exclusion of ORV from these areas would reduce pressure on the species by recreational uses at the Seashore. Under this alternative, recreational activities would still occur in the vicinity of the species and would still have the potential to impact them, with minor to moderate adverse impacts to piping plover from recreational use, and minor to moderate benefits from the protection offered.	Due to the beneficial impacts from <u>species management</u> , adverse impacts from recreational use would be expected to be long-term minor adverse.	Although the large SMAs would be beneficial to the species, continued recreation use in this area would still result in potential long-term minor to moderate adverse impacts to the species, which would be greater than those impacts under alternative C because of the increased access.	Although the large SMAs would be beneficial to the species, continued recreation use in this area would still result in potential long-term minor to moderate adverse impacts to the species, which would be greater than those impacts under alternative C because of the increased access to SMA areas.
Night-driving Restrictions					
Allowing unrestricted night driving under alternative A would result in long-term, moderate, adverse impacts	Restrictions on night-driving under alternative B would be provide long-term minor to moderate benefits to piping plovers; however, could still result in long-term, minor, adverse impacts during the time when night-driving is allowed (no night driving restrictions from September 16 to April 30).	The high level of protection at night from May 1 to November 15 under alternative C would result in long-term, moderate, beneficial impacts because it would reduce the potential for disturbance to <u>plover chicks and adults</u> that could result in mortality.	The high level of protection at night from May 1 to November 15 under alternative D would result in long-term, moderate, beneficial impacts because it would reduce the potential for disturbance to <u>plover chicks and adults</u> that could result in mortality.	Alternative E <u>would</u> result in long-term, minor to moderate, beneficial impacts because it would reduce the potential for disturbance to chicks that could result in mortality, but would still allow some level of night driving after dark (until 10:00 pm).	Alternative F would result in long-term, moderate, beneficial impacts because it would reduce the potential for disturbance to <u>plover chicks and adults</u> that could result in mortality.
Commercial Fishing					
There would be long-term negligible adverse impacts from commercial fishing.	Presence of commercial fishing operations would have a long-term negligible adverse impact, with long-term minor to moderate beneficial impacts from night-	Presence of commercial fishing operations would have a long-term negligible adverse impact, with long-term minor to moderate benefits	Presence of commercial fishing operations would have a long-term negligible adverse impact, with long-term	Management of commercial fishing under alternative E would be the same as alternative C resulting in long-term negligible	Management of commercial fishing under alternative F would be the same as alternative C resulting in long-term negligible adverse impacts

Comment [bdm49]: Discuss how and where.

Comment [bdm50]: Discuss differences.

Comment [bdm52]: Dates and hours of night time restriction missing.

Comment [bdm51]: Dates missing.