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Broili/CAHA/NPS@NPS, Britta Muiznieks/CAHA/NPS@NPS
bcc
Subject FINAL revised Species Management Table

Sandy,

After reviewing the RegNeg Committee final report that was submitted on March 30, I've made a few, relatively minor edits to our draft Species Management Table. See attached (one with Track Changes and the FINAL one with All Changes Saved). I'll work on finalizing the Alternatives Matrix and Routes & Areas Table next.



CAHA Species Mgmt Table.v04.01.09.TrkChngs.doc



CAHA Species Mgmt Table.v04.01.09.FINAL.doc

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CAHA Species Management Table v043/0123/09

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Definitions	<p>Breeding Behavior: Shorebird behavior that includes, but is not limited to, territorial behavior, courtship, mating, scraping, confirmed scrapes, and other breeding or nest building activities.</p> <p>Human Disturbance: Any human activity that changes the contemporaneous behavior of one or more individuals of breeding, nesting, foraging, or roosting Colonial Waterbirds, Piping Plover, Wilson's Plover, or American Oystercatcher. Behaviors indicating disturbance include defensive displays, alarm calls, flushing or leaving a nest or feeding area, and diving or mobbing pedestrians, dogs, or vehicles.</p> <p>Periodic Review: A systematic review of data, habitat conditions and other information to be conducted by NPS every 5 years, after a major hurricane, or after a significant change in protected species status (e.g., listing or de-listing), in order to evaluate the effectiveness of management actions in making progress toward the accomplishment of stated objectives. Periodic Review could result in changes to the management actions in order to improve effectiveness.</p> <p>Pre-Nesting Closure: A kind of Resource Closure in which an area of suitable habitat is proactively closed to ORVs and pedestrians at the start of the shorebird breeding season to provide undisturbed habitat for bird breeding activities to occur.</p> <p>Research Area: Area of suitable habitat set aside on a temporary or long-term basis (such as a study site or control plot) as part of a research project authorized by NPS under a research permit.</p> <p>Resource Closure: Any area posted as closed to all public entry in order to protect wildlife, such as breeding and foraging shorebirds and bird and turtle nests, or vegetation from human disturbance.</p> <p>Species Management Area (SMA): Area of suitable habitat that has had concentrated and recurring use by multiple individuals and/or multiple species of protected shorebirds during the breeding season or nonbreeding season, or concentrations of seabeach amaranth specimens, in more than one (i.e., two or more) of the past five years and is managed to reduce or minimize human disturbance. Currently designated SMAs are listed at the end of this table. SMAs will be re-evaluated and re-designated every 5 years, or after major hurricanes, as part of the Periodic Review process described at the end of this table.</p> <ul style="list-style-type: none"> - Breeding Shorebird SMA: Area of suitable breeding habitat that has had multiple nests of individuals and/or multiple species of protected shorebirds, or concentrations of seabeach amaranth specimens, in more than one (i.e., two or more) of the past five years and is managed to minimize human disturbance during the breeding season. Focal species for Breeding Shorebird SMAs include piping plover, Wilson's plover, American oystercatcher, least tern, common tern, gull-billed tern, and black skimmer; however, there will be ongoing evaluation of the breeding shorebird species addressed by this plan, as part of the Periodic Review process described at the end of this table. - Nonbreeding Shorebird SMA: Area of suitable nonbreeding habitat that has had concentrated foraging by migrating/wintering shorebirds in more than one (i.e., two or more) of the past five years and is managed to reduce to human disturbance during the nonbreeding season. This may include portions of breeding SMAs that provide suitable nonbreeding habitat during periods of overlap between the breeding and migrating season and designated non-ORV areas that are set aside to provide pedestrians

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with the opportunity for a natural beach experience.

Species Management 1 (SM1): An approach to shorebird protection during the breeding season that will use larger, longer lasting buffers with less monitoring to reduce the need for more frequent monitoring and fencing changes.

Species Management 2 (SM2): An approach to shorebird protection during the breeding season that will use smaller buffers and require more frequent monitoring and fencing changes when an ORV or pedestrian access corridor is open at designated locations during the breeding season.

Shorebirds			
Management Activity	Piping Plover (PIPL)	American Oystercatcher (AMOY) and Wilson's Plover (WIPL)	Colonial Waterbirds (CWB) include - Least Terns (LETE) - Common Terns (COTE) - Gull-billed Terns (GUTE) - Black Skimmers (BLSK)
Pre-Nesting Surveys	By March 1: NPS staff will evaluate all potential breeding habitat and recommend PIPL pre-nesting closures based on that evaluation. March 15 – July 15: Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once birds are present.	March 15 – July 15 Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once breeding pairs are present.	May 1 – July 15 Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once breeding pairs are present.
Pre-Nesting Closures	All Species: All designated Breeding Shorebird SMAs will be posted as pre-nesting closures using symbolic fencing by March 15 at sites involving PIPL, WIPL, and/or AMOY; and by April 15 at sites involving only CWB. NPS will determine the configuration of specific pre-nesting closures based on an annual habitat assessment. Pre-nesting closures will be adjusted to the configuration of the Nonbreeding Shorebird SMAs for the respective sites (as described later in this table) if no breeding activity is seen in the area by July 31 , or two weeks after all chicks have fledged, whichever comes later. Pre-nesting closures will not be modified in cases where the beach erodes into the buffered habitat. ORVs, pedestrians, and pets are prohibited within all resource closures, including: Pets are prohibited within all pre-nesting closures. SM1: SMAs designated as SM1 would not allow ORV or pedestrian access during the pre-nesting period. SM2: The Bodie Island Spit, Cape Point, and South Point Ocracoke SMAs are designated as SM2 in Action Alternatives C, E, and F.		

Comment [MSOffice1]: This only applies if no PIPL breeding activity has been observed at all. For example, this year we did not have any breeding activity at Hatteras Inlet and it would have been nice to pull it earlier. We still had AMOYs in the area that would have required an appropriate buffer.

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Once pre-nesting closures are implemented at these sites, a narrow ORV access corridor (where ORV use is permitted) or a pedestrian access corridor would be established where ORV use is not permitted. Upon the first observation of breeding activity, the standard buffers (Table 1) will apply, which depending upon the circumstances may close the access corridor. The Bodie Island Spit access corridor would follow the ocean shoreline to the inlet. The Cape Point access corridor would follow the ocean shoreline from Ramp 44 south to the point, then west approximately 0.2 miles along the ocean shoreline. The South Point Ocracoke the access corridor would follow the ocean shoreline south from Ramp 72 to the inlet. Exact configuration of the corridor would be determined by NPS staff based on the annual habitat assessment. The ORV access corridor at SM2 sites will generally be no more than 50 m wide above the high tide line and may involve a designated pass-through zone where no stopping or recreation would be permitted in order to minimize disturbance. An SM2 pedestrian access corridor would generally be below the high tide line and in no case greater than 10 m above the high tide line. Pets, kite flying, ball and Frisbee tossing, or similar activities will be prohibited in the access corridors while the pre-nesting closure is in effect.

<p>Courtship/Mating Surveys:</p>	<p>Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 3 times per week once breeding pairs are present.</p>		
<p>Courtship/Mating Buffers:</p>	<p><u>SM1/SM2:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 75 m buffer for the observed birds. Buffers will be increased in 50 m increments if human disturbance occurs. Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>	<p><u>SM1:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 300 m buffer for the observed birds. <u>SM2:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 150 m buffer for the observed birds. Buffers will be increased in 50 m increments if human disturbance occurs. <u>All:</u> Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>	<p><u>SM1:</u> If scraping is observed outside of an existing closure, establish or expand buffer to ensure 300 m buffer for the observed birds. <u>SM2:</u> If scraping is observed outside a resource closure, establish a 100 m buffer around the scrape location for LETE (if only LETE are present), or a 200 m buffer when other CWB species are present. Buffers will be increased in 50 m increments if human disturbance occurs. <u>All:</u> Closure establishment will be based on the location of scrape(s) and not location of copulation or "fish flashing". Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>
<p>Nest Surveys:</p>	<p>Conduct "walk through" to look for nests every 3 days.</p> <p>Conduct "walk through" to look for nests when observations suggest a</p> <p>Colonies will be surveyed by foot during the "peak" nesting period which generally is during the last week of May and the first week of June.</p>		

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	<p>Once nests are found, observe nests daily from a distance that does not disturb the birds, based on professional judgment. Approach nests once per week to observe and record data.</p>	<p>nest is present. SM1: Observe nests at least 3 times per week from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check nests on a weekly basis (or as staff is available). SM2: Observe nests daily from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check nests every three days.</p>	<p>but could be later, especially for BLSK. SM1: Observe colonies at least 3 times per week from a distance that does not disturb the birds. For incubating birds that cannot be observed from a distance, check colonies on a weekly basis. SM2: Observe nests daily from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check colonies every 3 days. All: Colonies will be surveyed by foot during the peak nesting period which generally is during the last week of May and the first week of June, but could be later, especially for BLSK.</p>
<p>Nest Buffers:</p>	<p>All Species: The park retains the discretion to expand nest buffers under SM1 and SM2 depending on staffing and bird behavior. In unprotected areas, a closure will be established immediately when a nest with egg(s) is found. Prior to hatching, vehicles may pass by such areas along designated vehicle corridors that are established along the outside edge of nesting habitat, provided that buffers adequate to prevent human disturbance are maintained. When nests or chicks occur in the immediate vicinity of paved roads, parking lots, campgrounds, buildings, and other facilities, NPS retains the discretion to provide resource protection to the maximum extent possible while still allowing those facilities to remain operational. NPS shall not reduce buffers to accommodate ORV ramp access. Buffers will remain in place for 2 weeks after a nest is lost to determine if pair will re-nest. Outside of pre-nesting areas, closures will be removed if no breeding activity is seen in the area for two weeks or 2 weeks after all chicks have fledged, whichever comes later.</p> <p>SM1 & SM2: Establish 75 m buffer/closure around nest(s). Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result.</p>	<p>SM1: Establish 300 m buffer/closure around nest(s). SM2: Establish 150 m buffer/closure around nest(s). Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result. For nests that occur inside a pre-nesting closure and require a buffer expansion of the pre-nesting area, the buffer expansion may be removed to the original pre-nesting closure after 2</p>	<p>SM1: Buffer will be the same as for courtship and mating – 300 meters. SM2: Establish 100 m buffer/closure around a LETE nest or colony; or 200 m buffer/closure around nest or colony if any COTE, GUTE, or BLSK are present. Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result. For a colony that occurs inside a pre-nesting closure and requires a buffer expansion of the pre-nesting area, the buffer expansion may be removed to the original pre-nesting closure after</p>

Comment [MSOffice2]: This only applies if no PPL breeding activity has been observed at all. For example, this year we did not have any breeding activity at Hatteras Inlet and it would have been nice to pull it earlier. We still had AMOYs in the area that would have required an appropriate buffer.

Comment [d3]: The majority of buffers specified by USGS and used by other nesting beaches only reference single studies without those studies being replicated by other researchers.

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<p>Adult Foraging Surveys & Buffer:</p>	<p>Survey suitable breeding habitat 3 times per week to monitor for adults with an associated scrape or nest territory foraging outside of an existing closure. If observe foraging outside an existing closure, survey the site daily. If observe foraging outside of a closure on 2 consecutive surveys, establish or expand the buffer using flexible increments based on observed bird behavior to include foraging site. These closures are intended to provide foraging opportunities close to breeding sites. Remove closure if no foraging observed for a 2-week period during the breeding season, or when associated breeding activity has concluded.</p>	<p>weeks with no breeding activity if the nest is lost to overwash or predation.</p> <p>No additional buffers/closures.</p>	<p>2 weeks with no breeding activity if the nest is lost to overwash or predation.</p> <p>No additional buffers/closures.</p>
<p>Unfledged Chicks Surveys:</p>	<p><u>SM1</u>: Observe brood once daily. <u>SM2</u>: Observe brood at least 1 hour each in am and pm daily. Have monitor(s) present during periods of ORV or pedestrian access. All: Observations end once chicks have fledged. Chicks are considered fledged at 35 days or are observed in sustained flight of >15 m.</p>	<p><u>SM1</u>: Observe brood every other day. <u>SM2</u>: Observe brood once daily for at least ½ hour. All: Observations end once the chicks have fledged. AMOY chicks are considered fledged if they have been observed to be proficient in flying or observed in sustained flight of >30 m. WIPL chicks are considered fledged if they are observed in sustained flight of >15 m.</p>	<p><u>SM1</u>: Observe colony every other day. <u>SM2</u>: Observe colony daily. All: Colonies will be surveyed by foot during the "peak" hatching period which should fall 21 days after initial nest observations. A follow-up survey (perimeter count) should be conducted during the "peak" fledge which should fall 20 days after hatch counts. Observations end after no unfledged chicks have been observed on three consecutive surveys.</p>
<p>Unfledged Chick Buffers:</p>	<p><u>SM1</u>: Establish a minimum 1000 m buffer on either side of the nest</p>	<p><u>SM1</u>: Establish a 300 m buffer around nest when unfledged chicks are present.</p>	<p><u>SM1</u>: Establish 300 m buffer around nests or colony, if chicks move outside of the buffer, it</p>

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<p>when unfledged chicks are present.</p> <p>SM2: Establish a 1000 m ORV buffer and where permitted a 300 m pedestrian buffer on either side of the nest when unfledged chicks are present. Buffer moves with chicks.</p> <p>All: The buffer should extend 1000 m for ORV (or 300 m for pedestrians) on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting area (2000 m wide for ORV or 600 m wide area for pedestrians) of protected habitat for PIPL chicks should extend from the ocean-side low water line to the sound-side low water line or to the farthest extent of dune habitat if no sound-side intertidal habitat exists.</p>	<p>If chicks move outside of the buffer, it will be adjusted to include an additional 200 m from the chick(s) location. Closure will be removed 2 weeks after fledging.</p> <p>SM2: Establish a 200 m buffer around the unfledged chick(s) location. Include foraging and roosting habitat from the ocean (low water line) to the dune (or sound shoreline, if accessible). Adjust/increase buffer as needed when chicks are mobile. Buffer moves with chicks.</p> <p>ORV access will not be allowed until WIPL chicks have fledged or 2 weeks after AMOY chicks have fledged (observed flight of 30 meters); a pedestrian corridor may be established prior to 2 week requirement for access to the points and spits.</p>	<p>will be adjusted to include provide a standard buffer of 200 m from the chick(s) location.</p> <p>SM2: Establish a 200 m buffer around the chick(s) location. Adjust buffer as needed when chicks are mobile.</p>
<p>All Species: Vehicles and/or pedestrians may be allowed to pass through portions of the protected area that are considered inaccessible to chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. Reopen access corridor outside of pre-nesting area after chicks fledge (except for AMOYs where the area will remain closed for an additional 2 weeks). Closures can be removed after July 31 or 2 weeks after all breeding activity has ceased or chicks have fledged, which ever is later.</p>	<p>All Species: Vehicles and/or pedestrians may be allowed to pass through portions of the protected area that are considered inaccessible to chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. Reopen access corridor outside of pre-nesting area after chicks fledge (except for AMOYs where the area will remain closed for an additional 2 weeks). Closures can be removed after July 31 or 2 weeks after all breeding activity has ceased or chicks have fledged, which ever is later.</p>	<p>All Species: Vehicles and/or pedestrians may be allowed to pass through portions of the protected area that are considered inaccessible to chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. Reopen access corridor outside of pre-nesting area after chicks fledge (except for AMOYs where the area will remain closed for an additional 2 weeks). Closures can be removed after July 31 or 2 weeks after all breeding activity has ceased or chicks have fledged, which ever is later.</p>
<p>Breeding Data Collected/Reported</p> <p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, location of breeding pairs, courtship behavior, foraging, scrapes, nests or brood observations; identity of observer - Pair, nest, and brood identification number - Number, location, and status of territorial pairs, nesting pairs, nests, eggs, and chicks. Use GPS to 	<p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, and location of breeding pair, scrape, nest, or brood observations; identity of observer - Pair #; Color band (if applicable) - Number, location, and status of pairs, scrapes, nests, eggs, and chicks. Use GPS to document nest location. - Status of eggs/nest and presence/ 	<p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, location, and species of nest/colony observation; identity of observer - Number and location of birds, nests, chicks, and fledglings. Use GPS to document colony location. - Status of colony and presence/behavior of adults (laying, incubating, lost, abandoned) - Status of chicks (behavior, fledge status) and

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	<p>document nest location.</p> <ul style="list-style-type: none"> - Status of eggs/nest and presence/behavior of adults (laying, incubating, lost, abandoned, hatching, hatched) - Status of chicks (age, behavior, fledge status) and presence/behavior of adults - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent - Reproductive rate (chicks fledged/nesting pair) 	<p>behavior of adults (laying, incubating, lost, abandoned, hatching, hatched)</p> <ul style="list-style-type: none"> - Status of chicks (age, behavior, fledge status) and presence/behavior of adults - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent - Reproductive rate (chicks fledged/nesting pair) 	<p>presence/behavior of adults</p> <ul style="list-style-type: none"> - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent
<p>Nonbreeding Survey</p>	<p>NPS will monitor presence, abundance, and behavior of migrating and wintering shorebirds from July through May using the SECN protocol. Survey sites will include all Nonbreeding Shorebird SMAs. NPS will obtain data similar to International Shorebird Survey (ISS) data. Record the following information: Date, time, and location of observations; identity of observer; species and number of birds observed; band combination of any banded birds; weather variables and tidal stage; habitat; behavior of the majority of birds in the flock (foraging, resting, disturbed [record source], other); site management in effect where birds are seen; number of pedestrians, pets, ORVs and other potential disturbances.</p>		
<p>Nonbreeding Shorebird SMAs</p>	<p><u>All Species:</u> Nonbreeding Shorebird SMAs will be established for migrating/wintering shorebirds at various locations throughout the Seashore. Such closures will be installed no later than when breeding season closures are removed at the same location(s). Pets will be prohibited within Nonbreeding Shorebird SMAs.</p> <p><u>Points and Spits:</u> An annual habitat assessment will be conducted after all birds have fledged from the area. Nonbreeding resource closures will be established at the points and spits based on habitat used by wintering PIPs in the past 3 years, the presence of birds at the beginning of the migratory season, and suitable habitat types based on the results of the annual survey. Actual locations of suitable foraging and roosting habitat may change periodically due to natural processes. Access to the inlet shoreline where permitted will be maintained by a corridor TBD by NPS staff based on the annual habitat assessment.</p> <p><u>Ocean Shoreline Areas:</u> In addition to the resource closures at the points and spits described above, NPS will establish non-ORV areas along the ocean shoreline for migrating and wintering shorebirds that will provide relatively less disturbed foraging, resting, and roosting areas for migrating and wintering birds. These may include wider sections of beach with an upper beach ORV corridor that</p>		

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	<p>has a buffer of at least 50 m above the high tide line; and/or sections of beach that have been designated as "non-ORV" for other reasons such as to provide pedestrians with opportunities for a natural beach experience. The following activities are generally compatible with migrating/wintering shorebird use of these areas: pedestrian access for fishing, beach walking, birding, kayaking, kite boarding, paddle boarding, photography, picnicking, sailing, shelling, stargazing, sunbathing, surfing, swimming, wildlife viewing and wind surfing. If monitoring determines that any single activity or collection of activities is negatively impacting shorebird use of a specific location, NPS may implement additional restrictions on compatible uses. The location(s) of all ocean shoreline Nonbreeding Shorebird SMAs will be subject to Periodic Review.</p>
<p>Adaptive Management Initiatives</p>	<p>NPS would take an Adaptive Management approach to the species management program in order to evaluate the effectiveness of and improve the measures identified above. The following adaptive management initiatives related to shorebirds or shorebird habitat have been identified:</p> <ul style="list-style-type: none"> - PIPL chick fledge rate: Develop an adaptive management study to evaluate the short-term performance target of one (1) chick fledged per breeding pair, as well as the 1.5 chicks fledged per pair productivity rate identified in the recovery plan, to determine what productivity rate is realistically attainable and would provide for a growing population at the Seashore over the long term. If the actual productivity rate is not sufficient to achieve the desired future conditions for piping plover, determine what management actions (e.g., frequency of monitoring, size or timing of buffers, etc.) need to be changed in order to achieve the desired results. - PIPL chick buffer distance: As stated in the PIPL recovery plan, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, FWS may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site. Develop an adaptive management study to evaluate whether a reduced ORV or pedestrian buffer distance (i.e., less than that stated in this plan) after a certain time period, such as two weeks after chicks have hatched, would be adequate to prevent disturbance of PIPL chicks by ORVs and/or pedestrians using adjacent areas during daylight hours. - Pass-through buffers during the incubation period for all species: Develop an adaptive management study or studies to evaluate whether a reduced buffer distance is adequate to prevent disturbance caused by ORVs driving past PIPL, AMOY, or CWB nest sites, if all other recreation (e.g., pedestrians, pets, etc.) is prohibited within the reduced buffer; and to determine if a reduced buffer is adequate to prevent disturbance caused by pedestrians walking below the high tide line past PIPL, AMOY, or CWB nest sites. - CWB social attraction: As a pilot project, develop an adaptive management study to evaluate the effectiveness of using CWB decoys and audio-attraction to establish or re-establish CWB colonies in suitable habitat. - Vegetation management: As a pilot project, develop an adaptive management study to evaluate methods for managing vegetation and improving habitat and wildlife access to available habitat in the Cape Point dredge pond area. Determine the applicability and potential effectiveness of such measures at other locations. - Habitat management: As a pilot project, develop an adaptive management study to evaluate methods of improving shorebird nesting and/or foraging habitat at one location in the Seashore by applying dredge material or by moving/manipulating sand or

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	<p>water at the site. Determine the applicability and potential effectiveness of such measures at other locations.</p> <ul style="list-style-type: none"> - <u>Enhanced Predator Management</u>: Develop an adaptive management study to evaluate whether predator management actions to be implemented under the (proposed) Predator Control Program for Protected Species Management are effective as is, or whether enhanced measures (such as managing avian predators or ghost crabs) would be beneficial and effective, or are necessary to achieve the desired future conditions for species protection. - <u>Change in Protected Species Status</u>: If a significant change were to occur in the status of protected shorebird species (e.g., listing or de-listing), as part of the Periodic Review process described at the end of this table there would be a systematic re-evaluation of the related species management actions identified in this plan to determine what changes in management, if any, are appropriate.
<p>Research</p>	<p>In addition to the Species Management procedures outlined in this table, through the issuance of a research permit NPS may authorize qualified researchers associated with recognized academic or research institutions to conduct additional scientific research on the respective species that will add to the existing knowledge of shorebird species or improve resource protection within the Seashore. Establishment of Research Area(s) may be authorized under such a permit.</p>
<p>Implementation of Adaptive Management & Research Initiatives</p>	<p>Should adaptive management initiatives and other research provide information that NPS believes is an adequate basis for management changes, such changes would be evaluated and considered for implementation as part of the 5-year Periodic Review process described at the end of this table.</p>
<p>Management Activity</p>	<p>Sea Turtles</p>
<p>Survey Time and Frequency</p>	<p>Sea turtle patrol will begin on May 1, unless leatherback nests have been reported within the state, in which case CAHA will follow the direction of NCWRC. Patrol will continue until September 15, or two weeks after the last sea turtle nest or crawl is found, whichever is later.</p> <p>Conduct daily morning surveys by ATV/UTVs and possibly ORVs for crawls and nests on all beaches generally before onset of public ORV use. Daily surveys for nests end September 15, or two weeks after the last sea turtle nest or crawl was found, whichever is later. Periodic monitoring (e.g., every two to three days) for unknown nesting and emerging hatchlings will continue, especially in areas of high visitation from that date until November 15.</p> <p>Monitoring will also occur for post-hatchling washbacks during periods when there are large quantities of seaweed washed ashore or following severe storm events. Nest observations stop when all nests have hatched or excavation indicates that the nest was not viable.</p> <p>Once a light filter fence is installed, monitor nests daily for signs of hatching emergence.</p>
<p>Sea Turtle Data</p>	<p>As a minimum, follow the North Carolina Wildlife Resources Commission Handbook and record:</p> <ul style="list-style-type: none"> - Date, location, and species of nests and false crawls; identity of observer

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<p>Collected/Reported</p>	<ul style="list-style-type: none"> - If nest needs to be relocated and, if so, why and where (new physical description and GPS location), number of eggs relocated, and time of day - Necessary protective measures for nest and hatchlings - Information regarding any post hatching nest excavation and analysis - Examine all nests after hatching to determine productivity rates. Excavate nests in the evening a minimum of 72 hours after hatching event. In cases where hatching events or dates were unknown, unearth nest cavities 80–90 days after the lay date. Any live hatchlings found during excavations will be released at dusk or after dark on the same day as excavation. - For strandings, the following will be recorded: species, location (GPS), measurements, indications of human interactions, and disposition of animal/carcass. Samples and photos will be collected when necessary. Necropsies will be conducted when possible.
<p>Nest Closures/ Buffers</p>	<p>Establish a buffer approximately 10 meters by 10 meters with symbolic fencing and signage around nest. Closure size may be modified due to environmental conditions at the nest site.</p> <p>Approximately 50– 55 days into incubation, closures will be expanded to the surf line. The width of the closure will be based on the type and level of use in the area of the beach where the nest was laid:</p> <ol style="list-style-type: none"> a. Vehicle-free areas with little or no pedestrian traffic – 25 meters wide (total width); b. Villages or other areas with high levels of day use – 50 meters wide (total width); c. Areas with ORV traffic – 105 meters wide (total width). <p>On the landward side of the nest, expand the closed area to 15 meters from the nest where possible, but no less than 10 meters landward from the nest. If appropriate, traffic detours behind the nest area will be established and clearly marked with signs and reflective arrows.</p> <p>Light filtering fence will be used in a U-shaped configuration around nests nearing their hatch dates, with the open face of the “U” oriented toward the water, to block light pollution from the villages and vehicles operating on the beach after dark.</p> <p>Once the buffer expansion is implemented, NPS staff will use rakes or a steel mat attached to an ATV to smooth any vehicle tracks between the nest and the water, so that tracks do not impede hatchlings from reaching the water.</p> <p>If multiple nests are located near each other (within 150 feet), and have similar hatch dates (within 14 days of each other), then closures will encompass all nests in the area, and will not be removed until all nests within the closure have hatched.</p>
<p>Nest Watch Program</p>	<p>Establish a cadre of trained volunteers to “watch” nests that have reached their hatch windows in order to monitor hatchling emergence success and success reaching the water, and to provide for the minimization of negative impacts from artificial lighting, predation, and human disturbance. Due to the number of nests that may be ready to hatch and the availability of volunteers, it may be necessary for NPS turtle staff to prioritize which nests are watched on any particular night. Priority will be given to watching the nests that are most likely to be negatively impacted by manageable factors.</p>
<p>Nest Relocation</p>	<p>By April 15th, areas deemed unsuitable for turtle nests (i.e. high erosion rate) will be identified by Park staff. Maps and descriptions of these areas will be analyzed by NCWRC prior to nesting season.</p> <p>When a nest is found, designated NPS staff will assess need for nest relocation and follow relocation guidance identified in the NCWRC handbook.</p>

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	<p>If it is determined the nest will not be relocated, it will be immediately protected with symbolic fencing and signs and will measure approximately 10 meters by 10 meters in size. Closure size may vary at the discretion of NPS staff due to the environmental factors at a nest location.</p> <p>If a nest is threatened by an imminent storm event, NPS will consult with NCWRC to determine appropriate action.</p>
Strandings	<p>Respond to sea turtle strandings in a timely manner, and report all information, pictures, and signs of human interaction to NCWRC. Necropsies of strandings will be done when possible.</p>
Light Restrictions	<p>From May 1 through November 15:</p> <ul style="list-style-type: none"> - Portable lanterns, auxiliary lights, and powered fixed lights of any kind shining for more than 5 minutes at a time would be prohibited on Seashore ocean beaches - Beach fires would be allowed/restricted as described in the respective alternatives
Night Driving Restrictions	<p>From May 1 to November 15, all non-essential vehicle use is restricted or prohibited as described in the respective alternatives</p>
Light Management	<p>By May 1, 2012, install turtle friendly lighting fixtures on all Seashore (NPS) structures visible from the ocean beach (except where prevented by other overriding lighting requirements, such as lighthouses which serve as aids to navigation) and fishing piers operated by NPS concessioners.</p> <p>Develop educational material to inform visitors about their impact on the success of sea turtle nests.</p> <p>Work with FWS, NCWRC, and Dare County to encourage development of a turtle friendly lighting ordinance and/or turtle friendly lighting education program for villages within the Seashore on Hatteras Island.</p>

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<p>Adaptive Management Initiatives</p>	<p>NPS would take an Adaptive Management approach to the species management program in order evaluate the effectiveness of and improve the measures identified above. The following adaptive management initiatives for sea turtles have been identified:</p> <ul style="list-style-type: none"> - Develop an assessment tool to measure ambient artificial lighting along the length of the Seashore, which can be used to re-assess conditions after any management actions (such as a lighting ordinance) are implemented to reduce artificial lighting. After light management actions are implemented, reassess levels of lighting and monitor and evaluate impacts on sea turtle nesting success. If supported by the findings, work toward an incremental adjustment (i.e., increase) in night access to limited select locations where not in significant conflict with turtle nesting activity. - Develop an adaptive management study to evaluate the level of human disturbance that might be caused, if any, by designating night driving routes to select points and spits, and to develop management tools to minimize impacts to an acceptable level. If supported by the findings, work toward an incremental adjustment (i.e., increase) in night access to limited select locations where not in significant conflict with turtle nesting activity. - Develop an adaptive management study to determine ways to increase the number of hatchlings that emerge and reach the water - Develop an assessment tool to measure ambient artificial lighting along the length of the Seashore, which can be used to re-assess conditions after any management actions are taken to reduce artificial lighting.
<p>Research</p>	<p>In addition to the Species Management procedures outlined in this table, through the issuance of a research permit NPS may authorize qualified researchers associated with recognized academic or research institutions to conduct additional scientific research on the respective species that will add to the existing knowledge of sea turtles or improve resource protection within the Seashore. Establishment of Research Area(s) may be authorized under such a permit.</p>
<p>Implementation of Adaptive Management & Research Initiatives</p>	<p>Should adaptive management initiatives and other research provide information that NPS believes is an adequate basis for management changes, such changes would be evaluated and considered for implementation as part of the 5-year Periodic Review process.</p>
<p>Seabeach Amaranth (SBA)</p>	
<p>Survey Time and Frequency</p>	<p>July – September: Before re-opening any shorebird closure or identifying alternate ORV corridors, survey for SBA seedlings/plants. August: Conduct conduct a parkwide annual survey for SBA in all potential habitats. Some shorebird closures may not be surveyed until just prior to re-opening an area to ORV traffic to minimize disturbance of nesting birds or chicks. End observations when all known SBA plants have died back.</p>
<p>Data Collected</p>	<p>Record location of all individual plants or plant clusters using a GPS and note if the plant is located in an area open or closed to</p>

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	recreational use.
Buffers	<p>June 1 – November 30</p> <p>Prior to June 1, identify suitable SBA habitat at points and spits and delineate with symbolic fencing by June 1 if such areas are not already protected within existing shorebird resource closure(s).</p> <p>If a plant/seedling is found outside of an existing closure, erect symbolic fencing with signage creating a 10 meter by 10 meter buffer around the plant. If plants are located next to each other, the area will be expanded to create one enclosure protecting several plants.</p> <p>If an SBA plant is found during the survey prior to reopening a bird closure to ORV and pedestrian use, the Seashore will protect the plant as described above and reopen the portions of the bird closure where SBA plants do not exist.</p> <p>If SBA is not present by September 1, SBA buffers will be removed. If SBA is present, buffers will remain until after the plants have senesced, which is typically around December 1.</p>
Periodic Review	<p style="text-align: center;">All Species</p> <p>A systematic review of data, annual reports, and other information would be conducted by NPS every 5 years, after a major hurricane, or if necessitated by a significant change in protected species status (e.g., listing or de-listing), in order to evaluate the effectiveness of management actions in making progress toward the accomplishment of stated objectives. Periodic Review could result in changes to the management actions in order to improve effectiveness.</p>

Shorebird / Waterbird Buffer Summary

Species	Breeding Behavior/ Nest Buffer		Unfledged Chicks
	SM1 / SM2	SM1 / SM2	SM1 / SM2
Piping Plover	75 m / 75 m	1000 m / 1000 m (ORV); 300m (Pedestrian)	
Wilson's Plover	300 m / 150 m	300 m / 200 m	
American Oystercatcher	300 m / 150 m	300 m / 200 m	
Least Terns	300 m / 100 m	300 m / 200 m	
Other Species CWB	300 m / 200 m	300 m / 200 m	

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Designated Breeding Shorebird SMAs (as of March 2009). Will be subject to the Periodic Review process, as described above:

- Bodie Island Spit: 0.2 miles south of Ramp 4 to inlet (est.1.9 miles)
- Ramp 27 to Ramp 30 (est. 2.1 miles)
- Ramp 32.5 to Ramp 34 (est. 1.5 miles)
- Approximately 2.0 miles south of Ramp 38 to north boundary of Buxton (est. 1.7 miles)
- Cape Point: 0.2 miles south of Ramp 44 to Ramp 45 (est. 2.2 miles)
- South Beach: Ramp 45 to Ramp 47 (est. 1.7 miles)
- Hatteras Inlet Spit: Ocean shoreline south of Pole Road to sound-side of inlet (est. 0.8 miles)
- North Ocracoke Spit: Ramp 59 to inlet (est. 1.4 miles)
- 0.5 miles south of Ramp 68 to 1.2 miles north of Ramp 70 (est. 1.0 mile)
- South Point Ocracoke: 0.5 miles south of Ramp 72 to inlet (est. 2.6 miles)

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Definitions	<p>Breeding Behavior: Shorebird behavior that includes, but is not limited to, territorial behavior, courtship, mating, scraping, confirmed scrapes, and other breeding or nest building activities.</p> <p>Human Disturbance: Any human activity that changes the contemporaneous behavior of one or more individuals of breeding, nesting, foraging, or roosting Colonial Waterbirds, Piping Plover, Wilson's Plover, or American Oystercatcher. Behaviors indicating disturbance include defensive displays, alarm calls, flushing or leaving a nest or feeding area, and diving or mobbing pedestrians, dogs, or vehicles.</p> <p>Periodic Review: A systematic review of data, habitat conditions and other information to be conducted by NPS every 5 years, after a major hurricane, or after a significant change in protected species status (e.g., listing or de-listing), in order to evaluate the effectiveness of management actions in making progress toward the accomplishment of stated objectives. Periodic Review could result in changes to the management actions in order to improve effectiveness.</p> <p>Pre-Nesting Closure: A kind of Resource Closure in which an area of suitable habitat is proactively closed to ORVs and pedestrians at the start of the shorebird breeding season to provide undisturbed habitat for bird breeding activities to occur.</p> <p>Research Area: Area of suitable habitat set aside on a temporary or long-term basis (such as a study site or control plot) as part of a research project authorized by NPS under a research permit.</p> <p>Resource Closure: Any area posted as closed to all public entry in order to protect wildlife, such as breeding and foraging shorebirds and bird and turtle nests, or vegetation from human disturbance.</p> <p>Species Management Area (SMA): Area of suitable habitat that has had concentrated and recurring use by multiple individuals and/or multiple species of protected shorebirds during the breeding season or nonbreeding season, or concentrations of seabeach amaranth specimens, in more than one (i.e., two or more) of the past five years and is managed to reduce or minimize human disturbance. Currently designated SMAs are listed at the end of this table. SMAs will be re-evaluated and re-designated every 5 years, or after major hurricanes, as part of the Periodic Review process described at the end of this table.</p> <p>- Breeding Shorebird SMA: Area of suitable breeding habitat that has had multiple nests of individuals and/or multiple species of protected shorebirds, or concentrations of seabeach amaranth specimens, in more than one (i.e., two or more) of the past five years and is managed to minimize human disturbance during the breeding season. Focal species for Breeding Shorebird SMAs include piping plover, Wilson's plover, American oystercatcher, least tern, common tern, gull-billed tern, and black skimmer; however, there will be ongoing evaluation of the breeding shorebird species addressed by this plan, as part of the Periodic Review process described at the end of this table.</p> <p>- Nonbreeding Shorebird SMA: Area of suitable nonbreeding habitat that has had concentrated foraging by migrating/wintering shorebirds in more than one (i.e., two or more) of the past five years and is managed to reduce to human disturbance during the nonbreeding season. This may include portions of breeding SMAs that provide suitable nonbreeding habitat during periods of overlap between the breeding and migrating season and designated non-ORV areas that are set aside to provide pedestrians</p>

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with the opportunity for a natural beach experience.

Species Management 1 (SM1): An approach to shorebird protection during the breeding season that will use larger, longer lasting buffers with less monitoring to reduce the need for more frequent monitoring and fencing changes.

Species Management 2 (SM2): An approach to shorebird protection during the breeding season that will use smaller buffers and require more frequent monitoring and fencing changes when an ORV or pedestrian access corridor is open at designated locations during the breeding season.

Shorebirds			
Management Activity	Piping Plover (PIPL)	American Oystercatcher (AMOY) and Wilson's Plover (WIPL)	Colonial Waterbirds (CWB) include <ul style="list-style-type: none"> - Least Terns (LETE) - Common Terns (COTE) - Gull-billed Terns (GUTE) - Black Skimmers (BLSK)
Pre-Nesting Surveys	<p>By March 1: NPS staff will evaluate all potential breeding habitat and recommend PIPL pre-nesting closures based on that evaluation.</p> <p>March 15 – July 15: Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once birds are present.</p>	<p>March 15 – July 15</p> <p>Survey pre-nesting closures 3 times per week.</p> <p>Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once breeding pairs are present.</p>	<p>May 1 – July 15</p> <p>Survey pre-nesting closures 3 times per week.</p> <p>Outside of pre-nesting closures, survey suitable habitat 2 times per week; increase to 3 times per week once breeding pairs are present.</p>
Pre-Nesting Closures	<p><u>All Species:</u> All designated Breeding Shorebird SMAs will be posted as pre-nesting closures using symbolic fencing by March 15 at sites involving PIPL, WIPL, and/or AMOY; and by April 15 at sites involving only CWB. NPS will determine the configuration of specific pre-nesting closures based on an annual habitat assessment. Pre-nesting closures will be adjusted to the configuration of the Nonbreeding Shorebird SMAs for the respective sites (as described later in this table) if no breeding activity is seen in the area by July 31, or two weeks after all chicks have fledged, whichever comes later. Pre-nesting closures will not be modified in cases where the beach erodes into the buffered habitat. ORVs, pedestrians, and pets are prohibited within all resource closures, including pre-nesting closures.</p> <p><u>SM1:</u> SMAs designated as SM1 would not allow ORV or pedestrian access during the pre-nesting period.</p> <p><u>SM2:</u> The Bodie Island Spit, Cape Point, and South Point Ocracoke SMAs are designated as SM2 in Action Alternatives C, E, and F.</p>		

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Once pre-nesting closures are implemented at these sites, a narrow ORV access corridor (where ORV use is permitted) or a pedestrian access corridor would be established where ORV use is not permitted. Upon the first observation of breeding activity, the standard buffers (Table 1) will apply, which depending upon the circumstances may close the access corridor. The Bodie Island Spit access corridor would follow the ocean shoreline to the inlet. The Cape Point access corridor would follow the ocean shoreline from Ramp 44 south to the point, then west approximately 0.2 miles along the ocean shoreline. The South Point Ocracoke the access corridor would follow the ocean shoreline south from Ramp 72 to the inlet. Exact configuration of the corridor would be determined by NPS staff based on the annual habitat assessment. The ORV access corridor at SM2 sites will generally be no more than 50 m wide above the high tide line and may involve a designated pass-through zone where no stopping or recreation would be permitted in order to minimize disturbance. An SM2 pedestrian access corridor would generally be below the high tide line and in no case greater than 10 m above the high tide line. Pets, kite flying, ball and Frisbee tossing, or similar activities will be prohibited in the access corridors while the pre-nesting closure is in effect.

<p>Courtship/Mating Surveys:</p>	<p>Survey pre-nesting closures 3 times per week. Outside of pre-nesting closures, survey suitable habitat 3 times per week once breeding pairs are present.</p>		
<p>Courtship/Mating Buffers:</p>	<p><u>SM1/SM2:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 75 m buffer for the observed birds. Buffers will be increased in 50 m increments if human disturbance occurs. Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>	<p><u>SM1:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 300 m buffer for the observed birds. <u>SM2:</u> If breeding activity is observed outside of an existing closure, establish or expand buffer to ensure 150 m buffer for the observed birds. Buffers will be increased in 50 m increments if human disturbance occurs. <u>All:</u> Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>	<p><u>SM1:</u> If scraping is observed outside of an existing closure, establish or expand buffer to ensure 300 m buffer for the observed birds. <u>SM2:</u> If scraping is observed outside a resource closure, establish a 100 m buffer around the scrape location for LETE (if only LETE are present), or a 200 m buffer when other CWB species are present. Buffers will be increased in 50 m increments if human disturbance occurs. <u>All:</u> Closure establishment will be based on the location of scrape(s) and not location of copulation or "fish flashing". Outside of pre-nesting areas, remove closure if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.</p>
<p>Nest Surveys:</p>	<p>Conduct "walk through" to look for nests every 3 days.</p>	<p>Conduct "walk through" to look for nests when observations suggest a</p>	<p>Colonies will be surveyed by foot during the "peak" nesting period which generally is during the last week of May and the first week of June.</p>

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<p>Once nests are found, observe nests daily from a distance that does not disturb the birds, based on professional judgment. Approach nests once per week to observe and record data.</p>	<p>nest is present. <u>SM1</u>: Observe nests at least 3 times per week from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check nests on a weekly basis (or as staff is available). <u>SM2</u>: Observe nests daily from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check nests every three days.</p>	<p>but could be later, especially for BLSK. <u>SM1</u>: Observe colonies at least 3 times per week from a distance that does not disturb the birds. For incubating birds that cannot be observed from a distance, check colonies on a weekly basis. <u>SM2</u>: Observe nests daily from a distance that does not disturb the birds, based on professional judgment. For incubating birds that cannot be observed from a distance, check colonies every 3 days.</p>
<p>Nest Buffers:</p>	<p><u>All Species</u>: The park retains the discretion to expand nest buffers under SM1 and SM2 depending on staffing and bird behavior. In unprotected areas, a closure will be established immediately when a nest with egg(s) is found. Prior to hatching, vehicles may pass by such areas along designated vehicle corridors that are established along the outside edge of nesting habitat, provided that buffers adequate to prevent human disturbance are maintained. When nests or chicks occur in the immediate vicinity of paved roads, parking lots, campgrounds, buildings, and other facilities, NPS retains the discretion to provide resource protection to the maximum extent possible while still allowing those facilities to remain operational. NPS shall not reduce buffers to accommodate ORV ramp access. Buffers will remain in place for 2 weeks after a nest is lost to determine if pair will re-nest. Outside of pre-nesting areas, closures will be removed if no breeding activity is seen in the area for two weeks, or 2 weeks after all chicks have fledged, whichever comes later.</p>	<p><u>SM1 & SM2</u>: Establish 75 m buffer/closure around nest(s). Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result.</p>
<p><u>SM1</u>: Establish 300 m buffer/closure around nest(s). <u>SM2</u>: Establish 150 m buffer/closure around nest(s). Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result. For nests that occur inside a pre-nesting closure and require a buffer expansion of the pre-nesting area, the buffer expansion may be removed to the original pre-nesting closure after 2 weeks with no breeding activity if the</p>	<p><u>SM1</u>: Buffer will be the same as for courtship and mating – 300 meters. <u>SM2</u>: Establish 100 m buffer/closure around a LETE nest or colony; or 200 m buffer/closure around nest or colony if any COTE, GUTE, or BLSK are present. Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result. For a colony that occurs inside a pre-nesting closure and requires a buffer expansion of the pre-nesting area, the buffer expansion may be removed to the original pre-nesting closure after 2 weeks with no breeding activity if the nest is</p>	<p><u>SM1</u>: Buffer will be the same as for courtship and mating – 300 meters. <u>SM2</u>: Establish 100 m buffer/closure around a LETE nest or colony; or 200 m buffer/closure around nest or colony if any COTE, GUTE, or BLSK are present. Buffer will be increased in 50 m increments if human disturbance occurs. If the buffer falls within the intertidal zone a full-beach closure will result. For a colony that occurs inside a pre-nesting closure and requires a buffer expansion of the pre-nesting area, the buffer expansion may be removed to the original pre-nesting closure after 2 weeks with no breeding activity if the nest is</p>

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<p>Adult Foraging Surveys & Buffer:</p>	<p>Survey suitable breeding habitat 3 times per week to monitor for adults with an associated scrape or nest territory foraging outside of an existing closure. If observe foraging outside an existing closure, survey the site daily. If observe foraging outside of a closure on 2 consecutive surveys, establish or expand the buffer using flexible increments based on observed bird behavior to include foraging site. These closures are intended to provide foraging opportunities close to breeding sites. Remove closure if no foraging observed for a 2-week period during the breeding season, or when associated breeding activity has concluded.</p>	<p>nest is lost to overwash or predation. No additional buffers/closures.</p>	<p>lost to overwash or predation. No additional buffers/closures.</p>
<p>Unfledged Chicks Surveys:</p>	<p><u>SM1</u>: Observe brood once daily. <u>SM2</u>: Observe brood at least 1 hour each in am and pm daily. Have monitor(s) present during periods of ORV or pedestrian access. <u>All</u>: Observations end once chicks have fledged. Chicks are considered fledged at 35 days or are observed in sustained flight of >15 m.</p>	<p><u>SM1</u>: Observe brood every other day. <u>SM2</u>: Observe brood once daily for at least ½ hour. <u>All</u>: Observations end once the chicks have fledged. AMOY chicks are considered fledged if they have been observed to be proficient in flying or observed in sustained flight of >30 m. WIPL chicks are considered fledged if they are observed in sustained flight of >15 m.</p>	<p><u>SM1</u>: Observe colony every other day. <u>SM2</u>: Observe colony daily. <u>All</u>: Colonies will be surveyed by foot during the "peak" hatching period which should fall 21 days after initial nest observations. A follow-up survey (perimeter count) should be conducted during the "peak" fledge which should fall 20 days after hatch counts. Observations end after no unfledged chicks have been observed on three consecutive surveys.</p>
<p>Unfledged Chick Buffers:</p>	<p><u>SM1</u>: Establish a minimum 1000 m buffer on either side of the nest when unfledged chicks are present.</p>	<p><u>SM1</u>: Establish a 300 m buffer around nest when unfledged chicks are present. If chicks move outside of the buffer, it will</p>	<p><u>SM1</u>: Establish 300 m buffer around nests or colony. If chicks move outside of the buffer, it will be adjusted to include provide a standard</p>

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	<p><u>SM2:</u> Establish a 1000 m ORV buffer and where permitted a 300 m pedestrian buffer on either side of the nest when unfledged chicks are present. Buffer moves with chicks.</p> <p><u>All:</u> The buffer should extend 1000 m for ORV (or 300 m for pedestrians) on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting area (2000 m wide for ORV or 600 m wide area for pedestrians) of protected habitat for PIPL chicks should extend from the ocean-side low water line to the sound-side low water line or to the farthest extent of dune habitat if no sound-side intertidal habitat exists.</p>	<p>be adjusted to include an additional 200 m from the chick(s) location. Closure will be removed 2 weeks after fledging.</p> <p><u>SM2:</u> Establish a 200 m buffer around the unfledged chick(s) location. Include foraging and roosting habitat from the ocean (low water line) to the dune (or sound shoreline, if accessible). Adjust/increase buffer as needed when chicks are mobile. Buffer moves with chicks.</p> <p>ORV access will not be allowed until WIPL chicks have fledged or 2 weeks after AMOY chicks have fledged (observed flight of 30 meters); a pedestrian corridor may be established prior to 2 week requirement for access to the points and spits.</p>	<p>buffer of 200 m from the chick(s) location.</p> <p><u>SM2:</u> Establish a 200 m buffer around the chick(s) location. Adjust buffer as needed when chicks are mobile.</p>
	<p>All Species: Vehicles and/or pedestrians may be allowed to pass through portions of the protected area that are considered inaccessible to chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. Reopen access corridor outside of pre-nesting area after chicks fledge (except for AMOYs where the area will remain closed for an additional 2 weeks). Closures can be removed after July 31 or 2 weeks after all breeding activity has ceased or chicks have fledged, which ever is later.</p>		
<p>Breeding Data Collected/Reported</p>	<p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, location of breeding pairs, courtship behavior, foraging, scrapes, nests or brood observations; identity of observer - Pair, nest, and brood identification number - Number, location, and status of territorial pairs, nesting pairs, nests, eggs, and chicks. Use GPS to 	<p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, and location of breeding pair, scrape, nest, or brood observations; identity of observer - Pair #: Color band (if applicable) - Number, location, and status of pairs, scrapes, nests, eggs, and chicks. Use GPS to document nest location. - Status of eggs/nest and presence/behavior of adults (laying, incubating, 	<p>Record the following data:</p> <ul style="list-style-type: none"> - Date, time, location, and species of nest/colony observation; identity of observer - Number and location of birds, nests, chicks, and fledglings. Use GPS to document colony location. - Status of colony and presence/behavior of adults (laying, incubating, lost, abandoned) - Status of chicks (behavior, fledge status) and presence/behavior of adults

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	<p>document nest location.</p> <ul style="list-style-type: none"> - Status of eggs/nest and presence/behavior of adults (laying, incubating, lost, abandoned, hatching, hatched) - Status of chicks (age, behavior, fledge status) and presence/behavior of adults - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent - Reproductive rate (chicks fledged/nesting pair) 	<ul style="list-style-type: none"> - lost, abandoned, hatching, hatched) - Status of chicks (age, behavior, fledge status) and presence/behavior of adults - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent - Reproductive rate (chicks fledged/nesting pair) 	<ul style="list-style-type: none"> - Indications of potential predators, humans, pets, or ORVs within posted areas - Indications of cause of nest or chick loss, if apparent
<p>Nonbreeding Survey</p>	<p>NPS will monitor presence, abundance, and behavior of migrating and wintering shorebirds from July through May using the SECN protocol. Survey sites will include all Nonbreeding Shorebird SMAs. NPS will obtain data similar to International Shorebird Survey (ISS) data. Record the following information: Date, time, and location of observations; identity of observer; species and number of birds observed; band combination of any banded birds; weather variables and tidal stage; habitat; behavior of the majority of birds in the flock (foraging, resting, disturbed [record source], other); site management in effect where birds are seen; number of pedestrians, pets, ORVs and other potential disturbances.</p>		
<p>Nonbreeding Shorebird SMAs</p>	<p><u>All Species:</u> Nonbreeding Shorebird SMAs will be established for migrating/wintering shorebirds at various locations throughout the Seashore. Such closures will be installed no later than when breeding season closures are removed at the same location(s). Pets will be prohibited within Nonbreeding Shorebird SMAs.</p> <p><u>Points and Spits:</u> An annual habitat assessment will be conducted after all birds have fledged from the area. Nonbreeding resource closures will be established at the points and spits based on habitat used by wintering PIPs in the past 3 years, the presence of birds at the beginning of the migratory season, and suitable habitat types based on the results of the annual survey. Actual locations of suitable foraging and roosting habitat may change periodically due to natural processes. Access to the inlet shoreline where permitted will be maintained by a corridor TBD by NPS staff based on the annual habitat assessment.</p> <p><u>Ocean Shoreline Areas:</u> In addition to the resource closures at the points and spits described above, NPS will establish non-ORV areas along the ocean shoreline for migrating and wintering shorebirds that will provide relatively less disturbed foraging, resting, and roosting areas for migrating and wintering birds. These may include wider sections of beach with an upper beach ORV corridor that</p>		

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	<p>has a buffer of at least 50 m above the high tide line; and/or sections of beach that have been designated as “non-ORV” for other reasons such as to provide pedestrians with opportunities for a natural beach experience. The following activities are generally compatible with migrating/wintering shorebird use of these areas: pedestrian access for fishing, beach walking, birding, kayaking, kite boarding, paddle boarding, photography, picnicking, sailing, shelling, stargazing, sunbathing, surfing, swimming, wildlife viewing and wind surfing. If monitoring determines that any single activity or collection of activities is negatively impacting shorebird use of a specific location, NPS may implement additional restrictions on compatible uses. The location(s) of all ocean shoreline Nonbreeding Shorebird SMAs will be subject to Periodic Review.</p>
<p>Adaptive Management Initiatives</p>	<p>NPS would take an Adaptive Management approach to the species management program in order evaluate the effectiveness of and improve the measures identified above. The following adaptive management initiatives related to shorebirds or shorebird habitat have been identified:</p> <ul style="list-style-type: none"> - <u>PIPL chick fledge rate</u>: Develop an adaptive management study to evaluate the short-term performance target of one (1) chick fledged per breeding pair, as well as the 1.5 chicks fledged per pair productivity rate identified in the recovery plan, to determine what productivity rate is realistically attainable and would provide for a growing population at the Seashore over the long term. If the actual productivity rate is not sufficient to achieve the desired future conditions for piping plover, determine what management actions (e.g., frequency of monitoring, size or timing of buffers, etc.) need to be changed in order to achieve the desired results. - <u>PIPL chick buffer distance</u>: As stated in the PIPL recovery plan, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, FWS may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site. Develop an adaptive management study to evaluate whether a reduced ORV or pedestrian buffer distance (i.e., less than that stated in this plan) after a certain time period, such as two weeks after chicks have hatched, would be adequate to prevent disturbance of PIPL chicks by ORVs and/or pedestrians using adjacent areas during daylight hours. - <u>Pass-through buffers during the incubation period</u>: Develop an adaptive management study or studies to evaluate whether a reduced buffer distance is adequate to prevent disturbance caused by ORVs driving past PIPL, AMOY, or CWB nest sites, if all other recreation (e.g., pedestrians, pets, etc.) is prohibited within the reduced buffer; and to determine if a reduced buffer is adequate to prevent disturbance caused by pedestrians walking below the high tide line past PIPL, AMOY, or CWB nest sites. - <u>CWB social attraction</u>: As a pilot project, develop an adaptive management study to evaluate the effectiveness of using CWB decoys and audio-attraction to establish or re-establish CWB colonies in suitable habitat. - <u>Vegetation management</u>: As a pilot project, develop an adaptive management study to evaluate methods for managing vegetation and improving habitat and wildlife access to available habitat in the Cape Point dredge pond area. Determine the applicability and potential effectiveness of such measures at other locations. - <u>Habitat management</u>: As a pilot project, develop an adaptive management study to evaluate methods of improving shorebird nesting and/or foraging habitat at one location in the Seashore by applying dredge material or by moving/manipulating sand or

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	<p>water at the site. Determine the applicability and potential effectiveness of such measures at other locations.</p> <ul style="list-style-type: none"> - <u>Enhanced Predator Management</u>: Develop an adaptive management study to evaluate whether predator management actions to be implemented under the (proposed) Predator Control Program for Protected Species Management are effective as is, or whether enhanced measures (such as managing avian predators or ghost crabs) would be beneficial and effective, or are necessary to achieve the desired future conditions for species protection. - <u>Change in Protected Species Status</u>: If a significant change were to occur in the status of protected shorebird species (e.g., listing or de-listing), as part of the Periodic Review process described at the end of this table there would be a systematic re-evaluation of the related species management actions identified in this plan to determine what changes in management, if any, are appropriate.
<p style="text-align: center;">Research</p>	<p>In addition to the Species Management procedures outlined in this table, through the issuance of a research permit NPS may authorize qualified researchers associated with recognized academic or research institutions to conduct additional scientific research on the respective species that will add to the existing knowledge of shorebird species or improve resource protection within the Seashore. Establishment of Research Area(s) may be authorized under such a permit.</p>
<p style="text-align: center;">Implementation of Adaptive Management & Research Initiatives</p>	<p>Should adaptive management initiatives and other research provide information that NPS believes is an adequate basis for management changes, such changes would be evaluated and considered for implementation as part of the 5-year Periodic Review process described at the end of this table.</p>
<p style="text-align: center;">Management Activity</p>	<p style="text-align: center;">Sea Turtles</p>
<p style="text-align: center;">Survey Time and Frequency</p>	<p>Sea turtle patrol will begin on May 1, unless leatherback nests have been reported within the state, in which case CAHA will follow the direction of NCWRC. Patrol will continue until September 15, or two weeks after the last sea turtle nest or crawl is found, whichever is later.</p> <p>Conduct daily morning surveys by ATV/UTVs and possibly ORVs for crawls and nests on all beaches generally before onset of public ORV use. Daily surveys for nests end September 15, or two weeks after the last sea turtle nest or crawl was found, whichever is later. Periodic monitoring (e.g., every two to three days) for unknown nesting and emerging hatchlings will continue, especially in areas of high visitation from that date until November 15.</p> <p>Monitoring will also occur for post-hatching washbacks during periods when there are large quantities of seaweed washed ashore or following severe storm events. Nest observations stop when all nests have hatched or excavation indicates that the nest was not viable.</p> <p>Once a light filter fence is installed, monitor nests daily for signs of hatchling emergence.</p>
<p style="text-align: center;">Sea Turtle Data</p>	<p>As a minimum, follow the North Carolina Wildlife Resources Commission Handbook and record:</p> <ul style="list-style-type: none"> - Date, location, and species of nests and false crawls; identity of observer

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<p>Collected/Reported</p>	<ul style="list-style-type: none"> - If nest needs to be relocated and, if so, why and where (new physical description and GPS location), number of eggs relocated, and time of day - Necessary protective measures for nest and hatchlings - Information regarding any post hatching nest excavation and analysis - Examine all nests after hatching to determine productivity rates. Excavate nests in the evening a minimum of 72 hours after hatching event. In cases where hatching events or dates were unknown, unearth nest cavities 80–90 days after the lay date. Any live hatchlings found during excavations will be released at dusk or after dark on the same day as excavation. - For strandings, the following will be recorded: species, location (GPS), measurements, indications of human interactions, and disposition of animal/carcass. Samples and photos will be collected when necessary. Necropsies will be conducted when possible.
<p>Nest Closures/ Buffers</p>	<p>Establish a buffer approximately 10 meters by 10 meters with symbolic fencing and signage around nest. Closure size may be modified due to environmental conditions at the nest site.</p> <p>Approximately 50– 55 days into incubation, closures will be expanded to the surf line. The width of the closure will be based on the type and level of use in the area of the beach where the nest was laid:</p> <ol style="list-style-type: none"> a. Vehicle-free areas with little or no pedestrian traffic – 25 meters wide (total width); b. Villages or other areas with high levels of day use – 50 meters wide (total width); c. Areas with ORV traffic – 105 meters wide (total width). <p>On the landward side of the nest, expand the closed area to 15 meters from the nest where possible, but no less than 10 meters landward from the nest. If appropriate, traffic detours behind the nest area will be established and clearly marked with signs and reflective arrows.</p> <p>Light filtering fence will be used in a U-shaped configuration around nests nearing their hatch dates, with the open face of the “U” oriented toward the water, to block light pollution from the villages and vehicles operating on the beach after dark.</p> <p>Once the buffer expansion is implemented, NPS staff will use rakes or a steel mat attached to an ATV to smooth any vehicle tracks between the nest and the water, so that tracks do not impede hatchlings from reaching the water.</p> <p>If multiple nests are located near each other (within 150 feet), and have similar hatch dates (within 14 days of each other), then closures will encompass all nests in the area, and will not be removed until all nests within the closure have hatched.</p>
<p>Nest Watch Program</p>	<p>Establish a cadre of trained volunteers to “watch” nests that have reached their hatch windows in order to monitor hatchling emergence success and success reaching the water, and to provide for the minimization of negative impacts from artificial lighting, predation, and human disturbance. Due to the number of nests that may be ready to hatch and the availability of volunteers, it may be necessary for NPS turtle staff to prioritize which nests are watched on any particular night. Priority will be given to watching the nests that are most likely to be negatively impacted by manageable factors.</p>
<p>Nest Relocation</p>	<p>By April 15th, areas deemed unsuitable for turtle nests (i.e. high erosion rate) will be identified by Park staff. Maps and descriptions of these areas will be analyzed by NCWRC prior to nesting season.</p> <p>When a nest is found, designated NPS staff will assess need for nest relocation and follow relocation guidance identified in the NCWRC handbook.</p>

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	<p>If it is determined the nest will not be relocated, it will be immediately protected with symbolic fencing and signs and will measure approximately 10 meters by 10 meters in size. Closure size may vary at the discretion of NPS staff due to the environmental factors at a nest location.</p> <p>If a nest is threatened by an imminent storm event, NPS will consult with NCWRC to determine appropriate action.</p>
Strandings	<p>Respond to sea turtle strandings in a timely manner, and report all information, pictures, and signs of human interaction to NCWRC. Necropsies of strandings will be done when possible.</p>
Light Restrictions	<p>From May 1 through November 15:</p> <ul style="list-style-type: none"> - Portable lanterns, auxiliary lights, and powered fixed lights of any kind shining for more than 5 minutes at a time would be prohibited on Seashore ocean beaches - Beach fires would be allowed/restricted as described in the respective alternatives
Night Driving Restrictions	<p>From May 1 to November 15, all non-essential vehicle use is restricted or prohibited as described in the respective alternatives</p>
Light Management	<p>By May 1, 2012, install turtle friendly lighting fixtures on all Seashore (NPS) structures visible from the ocean beach (except where prevented by other overriding lighting requirements, such as lighthouses which serve as aids to navigation) and fishing piers operated by NPS concessioners.</p> <p>Develop educational material to inform visitors about their impact on the success of sea turtle nests.</p> <p>Work with FWS, NCWRC, and Dare County to encourage development of a turtle friendly lighting ordinance and/or turtle friendly lighting education program for villages within the Seashore on Hatteras Island.</p>

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<p>Adaptive Management Initiatives</p>	<p>NPS would take an Adaptive Management approach to the species management program in order evaluate the effectiveness of and improve the measures identified above. The following adaptive management initiatives for sea turtles have been identified:</p> <ul style="list-style-type: none"> - Develop an assessment tool to measure ambient artificial lighting along the length of the Seashore, which can be used to re-assess conditions after any management actions (such as a lighting ordinance) are implemented to reduce artificial lighting. After light management actions are implemented, reassess levels of lighting and monitor and evaluate impacts on sea turtle nesting success. If supported by the findings, work toward an incremental adjustment (i.e., increase) in night access to limited select locations where not in significant conflict with turtle nesting activity. - Develop an adaptive management study to evaluate the level of human disturbance that might be caused, if any, by designating night driving routes to select points and spits, and to develop management tools to minimize impacts to an acceptable level. If supported by the findings, work toward an incremental adjustment (i.e., increase) in night access to limited select locations where not in significant conflict with turtle nesting activity. - Develop an adaptive management study to determine ways to increase the number of hatchlings that emerge and reach the water
<p>Research</p>	<p>In addition to the Species Management procedures outlined in this table, through the issuance of a research permit NPS may authorize qualified researchers associated with recognized academic or research institutions to conduct additional scientific research on the respective species that will add to the existing knowledge of sea turtles or improve resource protection within the Seashore. Establishment of Research Area(s) may be authorized under such a permit.</p>
<p>Implementation of Adaptive Management & Research Initiatives</p>	<p>Should adaptive management initiatives and other research provide information that NPS believes is an adequate basis for management changes, such changes would be evaluated and considered for implementation as part of the 5-year Periodic Review process.</p>
<p>Seabeach Amaranth (SBA)</p>	
<p>Survey Time and Frequency</p>	<p>July – September: Before re-opening any shorebird closure or identifying alternate ORV corridors, survey for SBA seedlings/plants. August: Conduct a parkwide annual survey for SBA in all potential habitats. Some shorebird closures may not be surveyed until just prior to re-opening an area to ORV traffic to minimize of disturbance of nesting birds or chicks. End observations when all known SBA plants have died back.</p>
<p>Data Collected</p>	<p>Record location of all individual plants or plant clusters using a GPS and note if the plant is located in an area open or closed to recreational use.</p>

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Buffers	<p>June 1 – November 30</p> <p>Prior to June 1, identify suitable SBA habitat at points and spits and delineate with symbolic fencing by June 1 if such areas are not already protected within existing shorebird resource closure(s).</p> <p>If a plant/seedling is found outside of an existing closure, erect symbolic fencing with signage creating a 10 meter by 10 meter buffer around the plant. If plants are located next to each other, the area will be expanded to create one enclosure protecting several plants.</p> <p>If an SBA plant is found during the survey prior to reopening a bird closure to ORV and pedestrian use, the Seashore will protect the plant as described above and reopen the portions of the bird closure where SBA plants do not exist.</p> <p>If SBA is not present by September 1, SBA buffers will be removed. If SBA is present, buffers will remain until after the plants have senesced, which is typically around December 1.</p>
All Species	
Periodic Review	<p>A systematic review of data, annual reports, and other information would be conducted by NPS every 5 years, after a major hurricane, or if necessitated by a significant change in protected species status (e.g., listing or de-listing), in order to evaluate the effectiveness of management actions in making progress toward the accomplishment of stated objectives. Periodic Review could result in changes to the management actions in order to improve effectiveness.</p>

Shorebird / Waterbird Buffer Summary

Species	Breeding Behavior/ Nest Buffer	Unfledged Chicks
	SM1 / SM2	SM1 / SM2
Piping Plover	75 m / 75 m	1000 m / 1000 m (ORV); 300m (Pedestrian)
Wilson's Plover	300 m / 150 m	300 m / 200 m
American Oystercatcher	300 m / 150 m	300 m / 200 m
Least Terns	300 m / 100 m	300 m / 200 m
Other Species CWB	300 m / 200 m	300 m / 200 m

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Designated Breeding Shorebird SMAs (as of March 2009). Will be subject to the Periodic Review process, as described above:

- Bodie Island Spit: 0.2 miles south of Ramp 4 to inlet (est. 1.9 miles)
- Ramp 27 to Ramp 30 (est. 2.1 miles)
- Ramp 32.5 to Ramp 34 (est. 1.5 miles)
- Approximately 2.0 miles south of Ramp 38 to north boundary of Buxton (est. 1.7 miles)
- Cape Point: 0.2 miles south of Ramp 44 to Ramp 45 (est. 2.2 miles)
- South Beach: Ramp 45 to Ramp 47 (est. 1.7 miles)
- Hatteras Inlet Spit: Ocean shoreline south of Pole Road to sound-side of inlet (est. 0.8 miles)
- North Ocracoke Spit: Ramp 59 to inlet (est. 1.4 miles)
- 0.5 miles south of Ramp 68 to 1.2 miles north of Ramp 70 (est. 1.0 mile)
- South Point Ocracoke: 0.5 miles south of Ramp 72 to inlet (est. 2.6 miles)