0028169

**From:** Britta Muiznieks
**To:** Mike Murray
**Cc:** Thayer Broili
**Subject:** Table 10 and CWBs
**Date:** 09/16/2010 08:08 AM
**Attachments:** Table 10-1 & 11.091110 BDM.docx

---

Mike-
I called Sandy yesterday and profusely apologized that our CWB totals are going to be changing again. I will send them up once they have been corrected. One of the things that we had to deal with this year is the fact that there were chicks on the ground in addition to nests. We don't know the locations (inside or outside of the nest cup) or the status (mobile or not mobile) of the chicks when they were counted. If there was a single chick and 2 eggs in a nest cup it should still only be counted as one nest but if they were outside of the nest cup there is no way to accurately say where they came from. Anyhow, at this point we will include nest totals/chick totals and just say that our nest numbers are underestimates since there were already chicks on the ground. For example the preliminary nest/chick numbers during our survey window that I am coming up with are 381 nests/118 chicks.


Table 10-1 & 11.091110 BDM.docx

Britta Muiznieks
Wildlife Biologist
Cape Hatteras National Seashore

252-995-3740-**Office**
252-475-8348-**Cell**
252-995-6998-**FAX**

## TABLE 10-1. SPECIES MANAGEMENT STRATEGIES FOR ALTERNATIVE F

**DEFINITIONS**

**Breeding behavior**: Shorebird behavior that includes, but is not limited to, courtship, mating, scraping, confirmed scrapes, and other breeding or nest-building activities.

**Human disturbance**: Any human activity that changes the contemporaneous behavior of beach nesting birds that are breeding, nesting, foraging, or roosting, or migrating/wintering birds that are using the beach and associated habitats for foraging, resting, or roosting. Bird behaviors indicating disturbance include defensive displays; alarm calls; flushing or leaving a nest or feeding area; and diving or mobbing pedestrians, dogs, or vehicles.

**Periodic review**: A systematic review of data, habitat conditions, and other information to be conducted by the NPS every 5 years, or after storms or events that Seashore management determines to be a major modification of habitat quantity or quality, 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. When desired future conditions for resources are met or exceeded, periodic review and adaptive management may allow for more flexible management of recreational use, provided adverse impacts of such use are effectively managed and wildlife populations remained stable. Where progress is not being made toward goals, periodic review and adaptive management may result in increased restrictions on recreational use.

**Pre-nesting closure**: A kind of resource closure in which an area of suitable habitat is proactively closed at the start of the shorebird breeding season to provide undisturbed habitat for bird breeding activities to occur.

**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.

**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.

| Management Activity | Shorebirds | | |
|---|---|---|---|
| | **Piping Plover and Wilson's Plover** | **American Oystercatcher** | **Colonial Waterbirds, including Least Terns, Common Terns, Gull-Billed Terns, and Black Skimmers** |
| **Pre-Nesting Surveys** | Mar 15 to Jul 15: Pre-nesting closures will be surveyed three times per week. Outside of pre-nesting closures, suitable habitat will be surveyed twice per week, increasing to three times per week once birds are present. | Mar 15 to Jul 15: Pre-nesting closures will be surveyed three times per week.<br>Outside of pre-nesting closures, suitable habitat will be surveyed twice per week, increasing to three times per week once breeding pairs are present. | May 1 to Jul 15: Pre-nesting closures will be surveyed three times per week.<br>Outside of pre-nesting closures, suitable habitat will be surveyed twice per week, increasing to three times per week once breeding pairs are present. |
| **Pre-Nesting Closures** | **All species**: By **Mar 1**, Seashore staff will evaluate all potential breeding habitat for piping plover, Wilson's plover and American oystercatcher and recommend pre-nesting closures for those species based on that evaluation. CWB breeding habitat will be evaluated by **Apr 1**. Areas of newly created habitat will also be evaluated during the annual habitat assessment Areas of suitable habitat that have had individual PIPL, WIPL or AMOY nests, or concentrations of more than 10 CWB nests in more than one of the past five years and new habitat that is particularly suitable for shorebird nesting, such as the habitat at new inlets or overwash areas, will be posted as pre-nesting closures using symbolic fencing (string between posts) or with other closure signs by **Mar 15** at sites involving piping plover, Wilson's plover, and/or American oystercatcher; and by **Apr 15** at sites involving only colonial waterbirds. Because CWB colonies may shift locations from year to year, ramps that have had colonies in more than one of the past five years will remain open until scraping or nesting is observed. Pre-nesting closures will still be established in these areas, however, the closure will allow vehicle access through the areas until scraping or nesting is documented at which point the appropriate buffer will be established. The NPS will determine the configuration of specific pre-nesting closures based on an annual habitat assessment. Pre-nesting closures would be removed if no breeding activity is seen in the area by **Jul 31** (or **Aug 15** if black skimmers are present), or 2 weeks after all chicks have fledged, whichever comes later. Nonbreeding shorebird habitat protection would be implemented, as described later in this table, before pre-nesting areas are removed. Pedestrian shoreline access below the high tide line will be permitted in front of (i.e., seaward of) pre-nesting areas until breeding activity is observed, then standard buffers for breeding activity will apply. Pets and horses are prohibited in pedestrian shoreline access areas in front of pre-nesting areas. ORVs, pedestrians, pets and horses are prohibited within all resource closures, including pre-nesting closures.<br>**ORV corridors at Cape Point and South Point:** When pre-nesting closures are implemented, the ORV access corridor at Cape Point and South Point will be reduced from 50 meters (164 ft) during the non-breeding season to 35 meters (115 ft). Once established, the pre-nesting closure will not be modified if the beach erodes into the ORV corridor or into the protected habitat. Once breeding activity is observed, standard buffers for breeding activity will apply. The ORV corridor width will be restored to 50 meters (164 ft) after breeding activity is completed at the site and pre-nesting closures are removed. | | |
| **Courtship/Mating Surveys** | **All species:** Pre-nesting closures would be surveyed three times per week. Outside of pre-nesting closures, potential suitable habitat would be surveyed three times per week once breeding pairs are present. | | |
| **Courtship/Mating Buffers** | **All species**: The Seashore retains the discretion to expand courtship/mating buffers depending on bird behavior. In unprotected areas, a buffer will be established within 12 daylight hours when courtship or mating by piping plover, Wilson's plover or American oystercatchers is observed. When courtship or mating is observed in the immediate vicinity of paved roads, parking lots, campgrounds, buildings, and other facilities, such as within the villages or at NPS developed sites, NPS retains the discretion to provide resource protection to the extent possible while still allowing those facilities to remain operational. NPS shall not reduce buffers to accommodate ORV corridors or ORV ramp access. | | |

**Formatted:** Width: 17", Height: 11"

**Comment [bdm1]:** I think we want to limit pedestrian access to the ocean and inlet shorelines.

**Comment [bdm2]:** I would prefer that pedestrians not be allowed into the pre-nesting closures after breeding activity has been observed. This would allow our techs to concentrate on the birds rather than worrying about whether or not pedestrians are in an open or closed area. Replace with "then the pre-nesting areas will be closed to pedestrians." Otherwise staff will be out there constantly shifting pedestrian buffers just like we are currently doing for ORVs.

| Management Activity | Shorebirds | | |
|---|---|---|---|
| | **Piping Plover and Wilson's Plover** | **American Oystercatcher** | **Colonial Waterbirds, including Least Terns, Common Terns, Gull-Billed Terns, and Black Skimmers** |
| | If breeding activity is observed outside of an existing closure or within a closure less than the prescribed buffer distance from the closure boundary, a buffer will be established or expanded to ensure a 75-meter buffer for the observed birds.<br>Buffers will be increased in 50-meter increments if human disturbance* occurs.<br>Outside of pre-nesting areas, closures will be removed if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded.<br>*Buffers are not expanded for incidental disturbance associated with required NPS protected species monitoring. | If breeding activity is observed outside of an existing closure or within a closure less than the prescribed buffer distance from the closure boundary, a buffer will be established or expanded to ensure a 150-meter buffer for the observed birds.<br>Buffers will be increased in 50-meter increments if human disturbance occurs.<br>Outside of pre-nesting areas, closures will be removed if no breeding activity is observed for at least a 2-week period, or when associated breeding activity has concluded. | Buffer establishment will be based on the location of scrape(s) and not location of copulation or "fish flashing." |
| **Scrape/Nest Surveys** | A walk-through will be conducted to look for scrapes/nests every 3 days until such monitoring will disrupt other nesting species in the area. Monitoring of known and potential breeding areas will continue from a distance.<br>Nests will be observed daily from a distance that does not disturb the birds, based on professional judgment.<br>Nests will be approached once per week to observe and record data. | A walk-through will be conducted to look for scrapes/nests when observations suggest a scrape or nest is present.<br>Nests will be observed daily from a distance that does not disturb the birds, based on professional judgment.<br>For incubating birds that cannot be observed from a distance, nests will be checked every 3 days. | If scrape(s)/nest(s) are observed outside a resource closure or within a closure less than the prescribed buffer distance from the closure boundary, a 100-meter buffer will be established around the scrape location for least terns (if only least terns are present), or a 200-meter buffer when other colonial waterbird species are present.<br>Buffers will be increased in 50-meter increments if human disturbance occurs.<br>Colonies will be surveyed during the peak nesting period for each species, which generally is during ~~the last week of May and the first week of June~~the first part of June for tern species, but could be later~~, especially~~ for species such as black skimmers.<br>~~Nests~~ Colonies will be observed daily from a distance that does not disturb the birds, based on professional judgment.<br>For incubating birds that cannot be observed from a distance, colony activity will be checked every 3 days. |
| **Scrape/Nest Buffers** | **All species**: The Seashore retains the discretion to expand scrape or nest buffers as needed to protect resources. In unprotected areas, a buffer will be established immediately when a nest with egg(s) is found. Prior to hatching, vehicles may pass by such areas within designated ORV access corridors that have been established along the outside edge of nesting habitat where, in the judgment of Seashore resources management staff, steep topography, dense vegetation, or other naturally-occurring obstacles minimize the risk of human disturbance. Such sites will be re-evaluated for disturbance during each subsequent survey. When scrape(s), nest(s) or chick(s) occur in the immediate vicinity of paved roads, parking lots, campgrounds, buildings, and other facilities, such as within the villages or at NPS developed sites, the NPS retains the discretion to provide resource protection to the extent possible while still allowing those facilities to remain operational. Regardless of the nature of the adjacent facilities, in all cases, as a minimum, NPS would provide signs, fencing and reduced buffers to protect nest(s) and chick(s) once they occur. The NPS shall not reduce buffers to accommodate an ORV corridor or ORV ramp access. Buffers will remain in place for 2 weeks after a nest is lost to determine if the pair will re-nest. For buffers that occur outside of, or that expand, the original pre-nesting areas, the buffer or expansion will be removed if no breeding activity is observed for a 2-week period, or when associated breeding activity has concluded. | | |
| | A 75-meter buffer/closure will be established around scrape(s) or nest(s). Buffers will be increased in 50-meter increments if human disturbance occurs.<br>If a buffer falls within the intertidal zone, a full-beach closure will result. | A 150-meter buffer/closure will be established around scrape(s) or nest(s). Buffers will be increased in 50-meter increments if human disturbance occurs.<br>If a buffer falls within the intertidal zone, a full-beach closure will result. | A 100-meter buffer/closure will be established around a least tern scrape, nest or colony.<br>A 200-meter buffer/closure will be established around the scrape, nest or colony if any common terns, gull-billed terns, or black skimmers are present.<br>Buffers will be increased in 50-meter increments if human disturbance occurs.<br>If a buffer falls within the intertidal zone, a full-beach closure will result. |
| **Adult Foraging Surveys and Buffer** | **PIPL:** Suitable breeding habitat will be surveyed three times per week to monitor for adults with an associated scrape or nest territory foraging outside of an existing closure. If birds are observed foraging outside an existing closure, the site will be surveyed daily. If birds are observed foraging outside of a closure on two consecutive surveys, the buffer will be established or expanded using flexible increments based on observed bird behavior to include the foraging site. These closures are intended to provide foraging opportunities close to breeding sites. The closure will be removed if no foraging is observed for a 2-week period during the breeding season, or when associated breeding activity has concluded.<br>**WIPL:** No additional buffers/closures. | No additional buffers/closures. | No additional buffers/closures. |

| Management Activity | Shorebirds | | |
|---|---|---|---|
| | **Piping Plover and Wilson's Plover** | **American Oystercatcher** | **Colonial Waterbirds, including Least Terns, Common Terns, Gull-Billed Terns, and Black Skimmers** |
| **Unfledged Chick Surveys** | **PIPL:** Brood will be observed at least one hour each in a.m. and p.m. daily.<br>**WIPL:** Observe brood once daily.<br>**All**: Observations will end once chicks have fledged. Chicks are considered fledged at 35 days of age or when observed in sustained flight of at least 15 meters. | Brood will be observed at least once daily. If the brood cannot be located, at least one-half hour will be spent in efforts to locate the brood/chick.<br>Observations will end once the chicks have fledged. Chicks are considered fledged if they have been observed to be proficient in flying or observed in sustained flight of at least 30 meters. | Colony will be observed daily.<br>~~Colonies will be surveyed during the peak hatching period, which should fall 21 days after initial nest observations.~~<br>~~A follow-up survey (perimeter count) should be conducted during the peak fledge, which should fall 20 days after hatch counts.~~<br>Observations will end after no unfledged chicks have been observed on three consecutive surveys. Chicks are considered fledged if they have been observed to be proficient in flying or observed in sustained flight of at least 15 meters. |
| **Unfledged Chick Buffers** | **PIPL:** A 1,000-meter ORV buffer and, where disturbance can be minimized, a 300-meter pedestrian buffer will be established on either side of the nest when unfledged chicks are present. Buffers move with chicks.<br>The buffer should extend 1,000 meters for ORVs (or 300 meters 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 (2,000 meters wide for ORVs or 600 meters wide for pedestrians) of protected habitat for piping plover chicks would extend from the oceanside low water line to the soundside low water line or to the farthest extent of dune habitat if no soundside intertidal habitat exists.<br>**WIPL:** A 200-meter buffer will be established around the unfledged chicks' location. Foraging and roosting habitat will be included from the ocean (low water line) to the dune (or sound shoreline, if accessible). Buffers will be adjusted/increased as needed when chicks are mobile. Buffers move with chicks. | A 200-meter buffer will be established around the unfledged chicks' location. Foraging and roosting habitat will be included from the ocean (low water line) to the dune (or sound shoreline, if accessible). Buffers will be adjusted/increased as needed when chicks are mobile. Buffers move with chicks.<br>In areas designated for ORV use, buffers will remain until 2 weeks after American oystercatcher chicks have fledged (observed flight of 30 meters); a pedestrian corridor may be established prior to the end of the 2-week waiting period for permitting access to the points and spits. | A 200-meter buffer will be established around the chicks' location. Buffers will be adjusted as needed when chicks are mobile. |
| | **All Species**: Vehicles and/or pedestrians may be allowed to pass through portions of the buffers or closures that are considered inaccessible to chicks because of steep topography, dense vegetation, or other naturally occurring obstacles. Access corridors outside of the pre-nesting area will be reopened after chicks fledge (except for American oystercatchers, where the area will remain closed for an additional 2 weeks). Pre-nesting closures can be removed after Jul 31, or 2 weeks after all breeding activity has ceased or chicks have fledged, whichever is later. | | |
| **Breeding Data Collection/Reporting** | The following data will be recorded:<br>Date, time, location of breeding pair, courtship behavior, foraging, scrape, nest, or brood observations; identity of observer.<br>Pair, nest, and brood identification number.<br>Number, location, and status of territorial pairs, nesting pairs, nests, eggs, and chicks. GPS will be used to document nest location.<br>Status of eggs/nest and presence/behavior of adults (laying, incubating, lost, abandoned, hatching, hatched).<br>Status of chicks (age, behavior, fledge status) and presence/behavior of adults.<br>Indications of potential predators, humans, pets, or ORVs within posted areas.<br>Indications of cause of nest or chick loss, if apparent.<br>Reproductive rate (chicks fledged per breeding pair). | The following data will be recorded:<br>Date, time, and location of breeding pair, scrape, nest, or brood observations; identity of observer.<br>Pair number; color band (if applicable).<br>Number, location, and status of pairs, scrapes, nests, eggs, and chicks. Use GPS to document nest location.<br>Status of eggs/nest and presence/behavior of adults (laying, incubating, lost, abandoned, hatching, hatched).<br>Status of chicks (age, behavior, fledge status) and presence/behavior of adults.<br>Indications of potential predators, humans, pets, or ORVs within posted areas.<br>Indications of cause of nest or chick loss, if apparent.<br>Reproductive rate (chicks fledged per breeding pair). | The following data will be recorded:<br>Date, time, location, and species of nest/colony observations; identity of observer.<br>Number and location of birds, nests, chicks, and fledglings. GPS will be used to document colony location.<br>Status of colony and presence/behavior of adults (laying, incubating, lost, abandoned).<br>Status of chicks (behavior, fledge status) and presence/behavior of adults.<br>Indications of potential predators, humans, pets, or ORVs within posted areas.<br>Indications of cause of nest or chick loss, if apparent. |
| **Nonbreeding Survey** | The NPS will monitor and document the presence, abundance, and behavior of migrating and wintering shorebirds from July through May. The NPS will obtain data similar to International Shorebird Survey data. The following information will be recorded: Date, time, and location of observations; identity of observer; species and number of birds observed; weather variables and tidal stage; habitat; behavior of the majority of birds in the flock (foraging, resting, disturbed [source will be recorded], other); site management in effect where birds are seen; and number of pedestrians, pets, ORVs and other potential disturbances. Species to be surveyed include piping plover, American oystercatcher, Wilson's plover, red knot, and other selected species. Species recently added to the surveys include whimbrel, sanderling, and black-necked stilt. | | |

**Comment [bdm3]:** This year we really cut back on the number of colony walkthroughs. The statewide surveys used to be done every other year but Chuck Hunter thought that that was even too much disturbance which is why they went to every third year now.

| Management Activity | Shorebirds | | |
|---|---|---|---|
| | **Piping Plover and Wilson's Plover** | **American Oystercatcher** | **Colonial Waterbirds, including Least Terns, Common Terns, Gull-Billed Terns, and Black Skimmers** |
| **Nonbreeding Shorebird Habitat Protection** | **All Species**: VFAs throughout the Seashore will provide relatively less disturbed foraging, resting, and roosting habitat for migrating and wintering birds. These areas will be open to pedestrians for recreational use. Pets on a leash in accordance with existing regulations will be permitted in VFAs, except as previously noted for pedestrian shoreline access in front of pre-nesting closures.<br>**Points and Spits**: An annual habitat assessment will be conducted after all birds have fledged from the area. Prior to removing pre-nesting closures, resource closures will be established in the most sensitive portions of nonbreeding shorebird habitat at the points and spits based on habitat used by wintering piping plovers in more than one (i.e., two or more) of the past 5 years, the presence of birds at the beginning of the migratory season, and suitable habitat types based on the results of the annual habitat assessment. People and pets will be prohibited in these resource closures. Actual locations of suitable foraging and roosting habitat may change periodically due to natural processes. Access to the inlet shorelines, where permitted, will be maintained by a corridor to be determined by NPS staff based on the annual habitat assessment. For the nonbreeding season, the ORV corridor at Bodie Island Spit, Cape Point and South Point will be established at 50 meters (164 ft) after breeding activity is completed and pre-nesting closures are removed. | | |
| **Adaptive Management Initiatives** | The 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. During the course of this plan, the NPS would seek funding and assistance to develop the following adaptive management initiatives related to shorebirds or shorebird habitat:<br>**Vegetation management**: As a pilot project, 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. The applicability and potential effectiveness of such measures at other locations will be determined.<br>**Habitat management**: As a pilot project, 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 water at the site. The applicability and potential effectiveness of such measures at other locations will be determined.<br>**Enhanced predator management**: 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.<br>**Colonial waterbird social attraction**: As a pilot project, an adaptive management study to evaluate the effectiveness of using colonial waterbird decoys and audio-attraction to establish or re-establish colonial waterbird colonies in suitable habitat.<br>**Piping plover chick fledge rate**: An adaptive management study to evaluate the short-term performance target of 1.0 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, it will be determined what management actions (e.g., frequency of monitoring; size or timing of buffers) need to be changed in order to achieve the desired results. The NPS would seek funding for this study as a conservation measure to contribute to the piping plover knowledge base pursuant to its *Endangered Species Act* recovery responsibilities.<br>After desired future conditions are attained, the NPS would seek funding to develop the following adaptive management initiatives related to resource protection buffers for shorebirds:<br>**Piping plover chick buffer distance**: 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 2 weeks after chicks have hatched, would be adequate to prevent disturbance of piping plover chicks by ORVs and/or pedestrians using adjacent areas during daylight hours.<br>**Pass-through buffers during the incubation period**: An adaptive management study or studies to evaluate whether a reduced buffer distance is adequate to prevent disturbance caused by ORVs driving past piping plover, American oystercatcher, or colonial waterbird nest sites if all other recreation (e.g., pedestrians, pets) is prohibited within the reduced buffer, and to determine whether a reduced buffer is adequate to prevent disturbance caused by pedestrians walking below the high tide line past piping plover, American oystercatcher, or colonial waterbird nest sites.<br>**Nonbreeding shorebird management:** Develop an adaptive management study to evaluate nonbreeding shorebird utilization of shoreline habitat that is open to ORV use compared to habitat that is not open to ORV use. Utilize findings in the future to determine best location and configuration of ORV corridors in areas designated for ORV use. | | |
| **Research** | In addition to the species management procedures outlined in this table, through the issuance of a research permit, the 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 Areas may be authorized under such a permit. | | |
| **Implementation of Adaptive Management and Research Initiatives** | Should adaptive management initiatives and other research provide information that the 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. | | |

| Management Activity | Sea Turtles |
|---|---|
| **Survey Time and Frequency** | Sea turtle patrol will begin on May 1, unless leatherback nests have been reported within the state, in which case, the Seashore will follow the direction of NCWRC. Patrol will continue until Sep 15, or 2 weeks after the last sea turtle nest or crawl is found, whichever is later.<br>Daily surveys will be conducted by ~~ATV/~~UTV (and occasionally by~~possibly~~ ORV) to search for crawls and nests on all cceanside beaches and spits, generally in the morning before onset of public ORV use. Daily surveys for nests end Sep 15, or 2 weeks after the last sea turtle nest or crawl is found, whichever is later. Periodic monitoring (e.g., every 2 to 3 days) for unknown nesting and emerging hatchlings will continue, especially in areas of high visitation, from that date until Nov 15.<br>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 will stop when all nests have hatched or excavation indicates that unhatched nests are not viable.<br>Once a light filter fence is installed, nests will be monitored daily for signs of hatchling emergence. |

**Comment [bdm4]:** We don't survey soundside beaches for example Haulover Beach. We did have a nest on the soundside of Hatteras Inlet this year.

| Management Activity | Sea Turtles |
|---|---|
| **Sea Turtle Data Collection/Reporting** | At a minimum, the NCWRC handbook will be followed and the following will be recorded:<br>• Date, location, and species of nests and false crawls; identity of observer.<br>• Whether nests need to be relocated and, if so, why and where (new physical description and GPS location), number of eggs relocated, and time of day.<br>• Necessary protective measures for nests and hatchlings.<br>• Information regarding any post-hatching nest excavation and analysis.<br>All nests will be examined after hatching to determine productivity rates. Nests will be excavated in the evening, a minimum of 72 hours after the hatching event. In cases where hatching events or dates are unknown, nest cavities will be unearthed 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.<br>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. |
| **Nest Closures/Buffers** | A buffer approximately 10 × 10 meters will be established with symbolic fencing and signage around nest. Closure size may be modified depending on environmental conditions at the nest site.<br>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:<br>1. VFAs with little or no pedestrian traffic—25 meters wide (i.e., 12.5 meters on either side of the nest).<br>2. Village beaches or other areas with high levels of pedestrian and other non-ORV use—50 meters wide (i.e., 25 meters on either side of the nest).<br>3. Areas with ORV traffic—105 meters wide (i.e., 52.5 meters on either side of the nest).<br>On the landward side of the nest, the closed area will be expanded 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.<br>On the seaward side of the nest closure, pedestrians will be allowed to walk through the intertidal zone during daylight hours.<br>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.<br>Once the buffer expansion is implemented, NPS staff will use rakes or a steel mat attached to ~~an ATV or a~~ UTV to smooth any vehicle tracks between the nest and the water, so that tracks do not impede hatchlings from reaching the water.<br>If multiple nests are located near each other (within 50 meters), 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. |
| **Nest Watch Program** | A cadre of trained volunteers will be established 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. Depending on 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. |
| **Nest Relocation** | In general, NPS staff will follow guidance in the NCWRC handbook and FWS Loggerhead Sea Turtle Recovery Plan, which is to allow nests to incubate at their original location if there is any reasonable likelihood of survival. Relocation of a nest is considered as a last resort.<br>By Apr 15, Seashore staff will conduct an annual sea turtle nesting habitat assessment to identify areas deemed unsuitable for turtle nests (e.g., those with a high erosion rate) and will discuss with NCWRC prior to nesting season to confirm the high erosion area(s) in which nest relocation would occur during the upcoming nesting season.<br>When a nest is found, designated NPS staff members will assess the need for nest relocation. If it is determined that the nest will NOT be relocated, it will be immediately protected with symbolic fencing and signs approximately 10 × 10 meters in size. Closure size may vary at the discretion of NPS staff depending on the environmental factors at a nest location. If it is determined that the nest will be relocated, NPS will follow relocation procedures identified in the NCWRC handbook. A nest will be relocated **only** when one or more of the following situations exist:<br>• The nest is located at or below the average high tide line, or within an existing “trough” or flooding pool above the average high tide line, where ***regular*** inundation or standing water will result in embryonic mortality.<br>• The nest is laid in an area that is known to be susceptible to erosion, as identified by the annual habitat assessment. Such areas typically include the following locations where known erosion or water table issues are known to cause nest mortality, such as spits, points, manmade groins, and re-constructed beaches~~, as is the case between Frisco and Hatteras Villages~~.<br>• When a nest is inspected to verify the presence of eggs and it is found that there are broken eggs in the nest resulting in yolk dripping down into the egg chamber. This situation can result from either predation or human impacts and can result in increased predation if the nest is left in place. NPS staff may “screen” a nest to further discourage additional predation from mammalian predators.<br>• The nest is laid in an area in which unusual, but lawfully conducted, human activities pose a serious threat to nests, such as emergency “beach push” following a major storm event. When these situations arise, NPS will consult with NCWRC prior to conducting these activities to discuss the impact on existing turtle nests.<br>If a nest is threatened by an imminent storm event, NPS will consult with NCWRC to determine appropriate action. |
| **Strandings** | The Seashore will respond to sea turtle strandings in a timely manner, and will forward or report all information, pictures, and signs of human interaction to NCWRC.<br>Necropsies of stranded turtles will be done when possible. |
| **Light Restrictions** | From May 1 through Nov 15:<br>• 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.<br>• Beach fires would be allowed/restricted as described in the respective alternatives. |
| **Night-Driving Restrictions** | From May 1 until Nov 15 all non-essential vehicle use is prohibited from 9:00 p.m. until 7:00 a.m., except from Sept 16 to Nov 15, ORV routes with no turtle nests remaining will reopen for night driving. |

**Comment [bdm5]:** I thought we were going to keep it as status quo (i.e. mark it as closed but not enforce it). I thought that we discussed issues of heavy pedestrian traffic especially in the villages and our inability to rake out all of the footprints with the staff that we have. In the future if we could recruit volunteers to do this we could consider allowing pedestrians in front of the closures. We also had concerns of people camping out in front of the closure and digging holes etc. This would require a lot more signage as well as sign maintenance since the signs will be in the intertidal zone and more prone to washing out.

**Comment [bdm6]:** I deleted the below sentence because I thought it was too specific. This year we had a number of nests in that area. If the nest was on the flat portion of the beach it was relocated to the dune where many of them did quite well.

| Management Activity | Sea Turtles |
|---|---|
| **Light Management** | By May 1, 2012, turtle-friendly lighting fixtures will be installed on all Seashore 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.<br>Educational material will be developed to inform visitors about their impact on the success of sea turtle nests.<br>The Seashore will work with the USFWS, the NCWRC, and Dare County to encourage development of a turtle-friendly lighting education program for villages within the Seashore on Hatteras Island. |
| **Adaptive Management Initiatives** | The 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. During the course of this plan, the NPS would seek funding and assistance to develop the following adaptive management initiatives for sea turtles:<br>• A study to develop a protocol for conducting an artificial lighting survey along the length of the Seashore, which can be used to assess artificial conditions before and after any management actions (such as a lighting ordinance) are implemented to reduce artificial lighting. After light management actions are implemented, levels of lighting will be reassessed and impacts on sea turtle nesting success will be monitored and evaluated.<br>• An adaptive management study to evaluate the level of human disturbance, if any, that might be caused 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, the NPS will work toward an incremental adjustment (i.e., increase) in nighttime ORV access to limited select locations where not in substantial conflict with turtle nesting and hatchling activity.<br>• An adaptive management study to determine ways to increase the number of male hatchlings that emerge and reach the water. The NPS would seek funding for this study as a conservation measure to contribute to the sea turtle knowledge base pursuant to its *Endangered Species Act* recovery responsibilities. |
| **Research** | In addition to the species management procedures outlined in this table, through the issuance of a research permit, the NPS may authorize qualified researchers associated with recognized academic or research institutions to conduct additional scientific research on turtle species that will add to the existing knowledge of sea turtles or improve resource protection within the Seashore. Establishment of research areas could be authorized under such a permit. |
| **Implementation of Adaptive Management and Research Initiatives** | 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. |
| **Management Activity** | **Seabeach Amaranth** |
| **Survey Time and Frequency** | Jul to Sep: Before removing any shorebird closures, surveys will be conducted for seabeach amaranth seedlings/plants.<br>Aug: A Seashore-wide annual survey for seabeach amaranth will be conducted in all potential habitats. Some shorebird closures may not be surveyed until just prior to reopening an area to ORV traffic to minimize disturbance of nesting birds or chicks.<br>Observations will end when all known seabeach amaranth plants have died back. |
| **Data Collection** | The location of all individual plants or plant clusters will be recorded using GPS. It will be noted whether the plant is located in an area open or closed to recreational use. |
| **Buffers/Closures** | Prior to Jun 1, suitable seabeach amaranth habitat will be identified at points and spits where plants have observed within the last 5 years and delineated with symbolic fencing if such areas are not already protected within existing shorebird resource closures.<br>If a plant/seedling is found outside of an existing closure, symbolic fencing with signage will be erected creating a 10- × 10-meter buffer around the plant. If plants are located next to one another, the area will be expanded to create one enclosure protecting several plants.<br>If a seabeach amaranth 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 seabeach amaranth plants do not exist.<br>If seabeach amaranth is not present by Sep 1, seabeach amaranth buffers will be removed. If seabeach amaranth is present, buffers will remain until after the plants have senesced, which is typically around Dec 1. |
| **Adaptive Management Initiatives** | 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. During the course of this plan, NPS would seek funding and assistance to develop the following adaptive management initiatives for seabeach amaranth:<br>A study to assess the feasibility of seabeach amaranth restoration at up to four suitable sites. NPS would seek funding for this study as a conservation measure to contribute to the seabeach amaranth knowledge base pursuant to its *Endangered Species Act* recovery responsibilities. |
| **Management Activity** | **All Species** |
| **Periodic Review** | 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. When desired future conditions for resources are met or exceeded, periodic review and adaptive management may allow for more flexible management of recreational use, provided adverse impacts of such use are effectively managed and wildlife populations remained stable. When progress is not being made toward the attainment of desired future conditions, periodic review and adaptive management may result in increased restrictions on recreational use. |

**Comment [bdm7]:** Why are they excluded? Can we make turtle friendly lighting a requirement of their permit? (Doug McGee's comment)

### TABLE 11. SHOREBIRD/WATERBIRD BUFFER SUMMARY FOR ALL ALTERNATIVES

| Species |
|---|

| | Alternative A | | Alternative B | | Alternatives C, D, and E | | Revised Alternative F | |
|---|---|---|---|---|---|---|---|---|
| | **Breeding Behavior/Nest Buffer** | **Unfledged Chicks** | **Breeding Behavior/Nest Buffer** | **Unfledged Chicks** | **Breeding Behavior/Nest Buffer (ML1 / ML2)** | **Unfledged Chicks (ML1 / ML2)** | **Breeding Behavior/Nest Buffer** | **Unfledged Chicks** |
| Piping plover | 46 meters | 183 meters | 50 meters | 1000 meters ORV (300 meters for pedestrians) | 75 meters / 75 meters | 1,000 meters ORV (300 meters for pedestrians | 75 meters | 1000 meters ORV (300 meters for pedestrians) |
| Wilson's plover | n/a | n/a | n/a | n/a | 300 meters / 150 meters | 300 meters / 200 meters | 75 meters | 200 meters |
| American oystercatcher | Behavior-based | 46-91 meters | 150 meters | 200 meters | 300 meters / 150 meters | 300 meters / 200 meters | 150 meters | 200 meters |
| Least tern | See other colonial waterbird | See other colonial waterbird | 100 meters | 200 meters | 300 meters / 100 meters | 300 meters / 200 meters | 100 meters | 200 meters |
| Other colonial waterbird species | Breeding based on behavior/nest 46-91 meters | 46-91 meters | 200 meters | 200 meters | 300 meters / 200 meters | 300 meters / 200 meters | 200 meters | 200 meters |

Note: Buffers apply to both ORVs and pedestrians, unless otherwise specified .