

**Nat Res Subcommittee Document w/Track Changes v01/19/09
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Survey Time and Frequency	Piping Plover	American Oystercatcher	Colonial Waterbirds
All Bird Species	<p><u>Species Management 1 (SM1):</u> Will use larger, longer lasting buffers with less monitoring to alleviate the need for constant monitoring and frequent fencing changes. Will be used at locations which would likely be closed anyway if SM2 buffers were used. Estimated staffing requirements TBD by NPS.</p> <p><u>Species Management 2 (SM2):</u> Will use smaller buffers and require more frequent monitoring and fencing changes. Will be used at selected inlets and Cape Point, and, at the discretion of NPS, at other locations in which more labor intensive management would provide access. Estimated staffing requirements TBD by NPS.</p> <p><u>Pass-through Corridors:</u> At a limited number of locations (TBD), a smaller buffer may be used as part of a controlled study with adequate monitoring (daily?) to determine if a smaller buffer for an ORV pass-through corridor is adequate to prevent disturbance.</p>		
Pre-Nesting Surveys	<p>By March 1, all potential habitats will have been evaluated. PIPL prenesting closures will be recommended based upon that habitat evaluation. Those closures will be installed by March 15.</p> <p>March 15 – July 15: Survey prenesting areas at least 3 times per week. Outside of prenesting areas and existing closures, survey suitable habitat 3 times per week; more often if breeding PIPL are observed in the area.</p> <p>Survey for Wilson's plover during piping plover surveys.</p> <p>Prenesting buffers will not be modified in cases where the beach erodes into the buffered habitat.</p>	<p>March 15 – July 15 survey historic breeding areas (last ten years) 2 times per week. If/when AMOY pairs are observed in an area, survey site 3 times per week. As of May 1 turtle staff will observe for AMOYs during daily patrols. Turtle patrol will take over monitoring after July 15th.</p>	<p>April 1 – July 15 survey historic breeding areas (last ten years) 2 times per week. If/when CWB are observed in an area, survey site 3 times per week. As of May 1 turtle staff will observe for CWBs during daily patrols (i.e., survey for CWB while observing for AMOY.) Turtle patrol will take over monitoring after July 15th.</p>
Pre-Nesting Buffers	<p><u>SM1:</u> Areas designated as SM1 Resource Areas will not allow ORV or pedestrian access during the prenesting period.</p> <p><u>SM2:</u> Areas designated as SM2 may have a designated ORV and/or pedestrian access corridor, provided prescribed buffers for the respective species are maintained. In areas open to ORV use, delineate the ORV corridor with posts placed up to 100 feet above the high tide line, or as designated in a site specific plan (e.g., Bodie Island Spit, Cape Point, and South Point). During the breeding season, pets are prohibited in pass-through corridors or at the points and spits. As breeding season progresses, SM2 prenesting closures may be modified as needed to maintain adequate buffers around breeding birds of all species.</p>		

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	<p>In February or March of each year, NPS natural resource staff will conduct an annual assessment of piping plover breeding habitat to plan pre-nesting closures in recent breeding areas that are adapted to current habitat and physiographic conditions. Recent breeding areas will be closed by posting symbolic fencing by March 15. Closures will be removed if no breeding activity is seen in the area by July 15, or 2 weeks after chicks in the area have fledged, whichever comes later.</p>	<p><u>SM1 and SM2</u>: Pre-nesting closures will be installed by March 15 in areas that had nest(s) in the past 3 years, if habitat is still suitable. Closures will be removed if no breeding activity is seen in the area by July 15, or 2 weeks after the site is abandoned by AMOY, whichever comes later.</p>	<p><u>SM1 & SM2</u>: Pre-nesting closures will be established for CWB by April 1 in areas that had a colony (or colonies) of at least ____ (#) nests in the past 3 years, if habitat is still suitable. Closures will be removed if no breeding activity is seen in the area by July 15, or two weeks after the site has been abandoned by CWB, whichever comes later.</p>
<p>Courtship/Mating Surveys:</p>	<p>If PIPL, AMOY, or CWB are observed exhibiting territorial or courtship behavior in suitable habitat, or if scrapes are observed in the absence of courtship behavior, observe 3 times per week. Survey potential new habitat 2 times per week; increase to 3 times week once birds are observed in the area.</p>		
<p>Courtship/Mating Buffers:</p>	<p>If courtship or copulation is observed outside of existing pre-nesting closures, establish or expand buffer to ensure 50 m buffer for the observed birds. Buffer will be increased in 50 m increments if disturbance occurs.</p>	<p><u>SM1</u>: Outside of existing pre-nesting closures, if one observation of scraping or territorial behavior has been documented or if a scrape is being maintained, a 300 meter buffer will be established around the bird activity.</p> <p>Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access.</p> <p><u>SM2</u>: Outside of existing pre-nesting closures, if one observation of scraping or territorial behavior has been documented or if a scrape is being maintained, a 150 meter pedestrian/ORV buffer will be established around the bird activity. If, in the judgment of NPS</p>	<p><u>SM1</u>: Outside of existing pre-nesting closures, if one observation of scraping or territorial behavior has been documented or if scrapes are being maintained, a 300 meter buffer will be established around the scrape locations. Closure establishment will be based on the locations of scrapes and not locations for copulation or “fish flashing”.</p> <p>Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access.</p> <p><u>SM2</u>: Outside of existing pre-nesting closures, if one observation of scraping or territorial behavior has been documented or if scrapes are being maintained, establish a buffer around the scrape location. Buffer will be 100 meters for least terns and 200 meters if the colony contains common terns, gull-billed terns</p>

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		Resources Management staff, a pair has abandoned a territory and established a new territory at another location, the buffer may be removed at the abandoned territory.	or black skimmers If, in the judgment of NPS Resources Management staff, a colony has abandoned a territory and established a new territory at another location, the buffer may be removed at the abandoned territory.
Nesting Surveys:	Nesting survey (walk-through to looks for nests) conducted every 3 days.	Nesting survey (walk-through to looks for nests) conducted when observations suggest a nest is present.	Colonies will be surveyed by foot during the “peak” nesting period which is during the last week of May and the first week of June.
Nest Observation:	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. If nest buffer is less than ___ m observe nest at least 1 hour per day to determine if disturbance is occurring.	<u>SM1</u> : Observe nests at least 3 times per week from a distance. 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 3 days.	<u>SM1</u> : Observe colonies at least three times per week from a distance. 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 three days.
Nesting Buffers:	<u>All species</u> : The park retains the discretion to expand 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. When nesting occurs 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 sites to remain operational. Buffers will remain in place for 2 weeks after a nest is lost to determine if pair will re-nest, if no other species nesting in area. After July 15, closures will be removed outside of prenesting closures two weeks after all nesting is complete or all chicks in area have fledged, whichever is later. After August 1 the 2-week removal period will no longer be required for closure removal.		
	<u>SM1 & SM2</u> : Establish 50 m buffer around piping plover nests occurring outside existing closures. If bird leaves nest due to human disturbance, buffer will be increased in 50 m increments until disturbance is abated. If the nest buffer falls within the intertidal zone a	<u>SM1</u> : Use buffer of 300 m. Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access. <u>SM2</u> : Use buffer of 150 m around	<u>SM1</u> : Use buffer of 300 m. Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access. <u>SM2</u> : Use buffer of 100 m for least terns and 200 m if the colony contains common terns, gull-billed

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	<p>full-beach closure will result.</p> <p>If buffer is adequate to prevent human disturbance, a designated ORV or pedestrian access corridor can be maintained during incubation. During breeding season, pets are prohibited in pass-through corridors or at the points and spits.</p>	<p>nests occurring outside of existing closures.</p> <p><u>All</u>: Establish buffer immediately when nest is located. Increase buffer in flexible increments if necessary to prevent human disturbance. If the buffer falls within the intertidal zone a full-beach closure will result.</p> <p>For AMOY nests that occur inside a prenesting closure at one of the points or spits <u>and</u> requires a buffer expansion of the prenesting area, if the nest is lost due to overwash or predation, the buffer expansion shall be removed to the original prenesting closure.</p> <p>During breeding season, pets are prohibited in pass-through corridors or at the points and spits.</p>	<p>terns or black skimmers.</p> <p><u>All</u>: Establish buffer immediately when nest/colony is located. Increase buffer in flexible increments if necessary to prevent human disturbance. If the buffer falls within the intertidal zone a full-beach closure will result.</p> <p>For a colony that occurs inside a prenesting closure at one of the points or spits <u>and</u> requires buffer expansion of the prenesting area, if the colony is over-washed or predated, the buffer expansion shall be removed to the original prenesting closure.</p> <p>During breeding season, pets are prohibited in pass-through corridors or at the points and spits.</p>
<p>Pass-through Corridors during Courtship/Mating and Incubation</p>	<p>n/a</p>	<p>At a limited number of locations (TBD), a smaller buffer (less than 150 m) may be used as part of a controlled study with adequate monitoring (daily?) to determine if a smaller buffer for an ORV pass-through corridor is adequate to prevent disturbance.</p>	<p>At a limited number of locations (TBD), for the respective CWB species, a smaller buffer (100 m for LETE; 200 m when other species present) may be used as part of a controlled study with adequate monitoring (daily?) to determine if a smaller buffer for an ORV pass-through corridor is adequate to prevent disturbance.</p>
<p>Adult Foraging Surveys & Buffer:</p>	<p>Survey suitable piping plover breeding habitat 3 times per week to monitor for breeding adults (with an associated scrape or nest territory) foraging outside of an existing closure. If observe foraging outside of existing closure, survey site <u>daily</u>. If observe foraging outside of buffer on two consecutive surveys, establish or expand the buffer using flexible increments based on</p>	<p>No additional buffers/closures.</p>	<p>No additional buffers/closures.</p>

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	<p>observed bird behavior to include foraging site if the foraging area is associated with a prenesting closure. 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>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. 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 at a minimum every other day. <u>SM2</u>: Observe brood once daily. Observations 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 >30 m.</p>	<p>Colonies will be surveyed by foot during the “peak” hatching period which should fall 21 days after initial nest counts. A follow-up survey by foot should be conducted during the “peak” fledge which should fall 20 days after hatch counts. <u>SM1</u>: Observe colony weekly. <u>SM2</u>: Observe colony at two-three day intervals; or daily if shoreline is open to ORV use. Observations end after no unfledged chicks have been observed on two consecutive occasions. Closure can be removed after all chicks have fledged.</p>
<p>Unfledged Chick Buffers:</p>	<p><u>SM1</u>: Establish a minimum 1000 meter buffer on either side of brood based on observation of bird behavior and terrain conditions at site. No ORV or pedestrian access until all chicks have fledged. <u>SM2</u>: For the first 2 weeks after hatching, establish a 1000 m buffer for ORVs and pedestrians on either side of the brood. Based on mobility of the brood, at the discretion of park management, the buffer can be reduced after the first two</p>	<p><u>SM1</u>: Establish a 300 meter buffer when unfledged chicks are present. Include foraging and roosting habitat from the ocean intertidal zone to the dune (or sound shoreline, if applicable), if accessible. Closure would be removed 2 weeks after fledging. Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access. <u>SM2</u>: Establish a 200 meter buffer</p>	<p><u>SM1</u>: Use 300 m buffer. If chicks move outside of the buffer, it will be adjusted to include an additional 200 meters from the chick(s) location outside of the closure. Consider using SM2 buffer and survey frequency at sites in which the smaller buffer would still allow access. <u>SM2</u>: Establish a 200 meter buffer around the chick(s) location. Adjust buffer as needed when chicks are mobile. Monitor daily if shoreline in front of colony open to ORV use.</p>

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	<p>weeks to 500 m for ORVs and 200 m for pedestrians. (If ORV buffer is less than 500 m, then constant monitoring is required.) Points and spits would only be accessible from 7 a.m. to 7 p.m. as long as unfledged PIPL chicks are in the area and only if prescribed buffers can be maintained. The 7 a.m. opening may be delayed until the chicks have been located. If chicks are highly mobile, the 1000 m buffer may need to be maintained. Buffer moves with chicks. Vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to PIPL chicks because of steep topography, dense vegetation, or other naturally occurring obstacles.</p>	<p>around the unfledged chick(s) location. Include foraging and roosting habitat from the ocean intertidal zone to the dune (or sound shoreline), if accessible. Adjust/increase buffer as needed when chicks are mobile.</p> <p>ORV access would not be allowed until 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>Reopen access corridor outside of prenesting area after chicks fledge (except for AMOYs where the area will remain closed to ORVs for an additional 2 weeks). During breeding season, pets are prohibited in pass-through corridors or at the points and spits. Remove prenesting closure 2 weeks after all chicks in the area have fledged.</p>			
<p>Non-breeding / Wintering Survey</p>	<p>NPS will monitor presence, abundance and behavior of migrating and wintering PIPL, AMOY, WIPL, and REKN 3 times per month at the points and spits July 1 through May 31 following the existing NPS winter monitoring protocol. In addition, the International Shorebird Survey (ISS) protocol will be used to document other migrating/wintering species.</p>		
<p>Non-breeding / Wintering Areas</p>	<p>An annual migrating/wintering habitat assessment will be conducted of the points and spits by NPS after all chicks have fledged in the area. Migrating/wintering <u>resource closures</u> will be established at designated points and spits in conjunction with the removal of prenesting closures at the respective sites, and will be based on habitat used by migrating/wintering PIPLs 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. Access to inlet shoreline will be maintained via a corridor TBD by NPS Resources Management staff based on an annual habitat assessment.</p> <p>To benefit all species of migrating shorebirds, at other locations (TBD), designated non-ORV areas (open to pedestrians) will also provide relatively less disturbed foraging areas for migrating/wintering birds. Actual locations of suitable foraging and resting habitat may change periodically due to natural processes.</p>		

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<p>Data Collected</p>	<p>Collect data as recommended by USGS (<i>list</i>) and use GPS to document nest locations.</p> <p>Record locations where territorial/courtship behavior occurs, including scrape locations.</p> <p>Estimate where adult and chick foraging occurs. Chicks should never be disturbed to obtain this information.</p> <p>Record presence and abundance of birds. Assess productivity and reasons for nest failure.</p>	<p>Collect data as recommended by USGS (<i>list</i>) and use GPS to document nest locations.</p> <p>Record presence and abundance of birds. Assess productivity and reasons for nest failure.</p>	<p>Collect data as recommended by USGS (<i>list</i>) and use GPS to document colony locations.</p> <p>Record presence and abundance of birds.</p>
<p>Sea Turtles (a minimum of 7 field personnel is required to meet the daily monitoring requirements on the Park's 67 miles of shoreline)</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 before onset of heavy 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 hatchling emergence.</p>		
<p>Data Collected</p>	<p>Follow the North Carolina Wildlife Resources Commission Handbook and record:</p> <ul style="list-style-type: none"> -Turtle species -Nest vs. false crawl -Location (physical description and GPS location) -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 <p>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</p>		

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	<p>hatchlings found during excavations will be released after dark on the same day as excavation.</p> <p>For strandings the following will be recorded: species, location, measurements, and signs of human interactions. Samples and photos will be collected when necessary. Necropsies will be conducted when possible.</p>
Nest Closures/ Buffers	<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 expanded to the surf line. The width of the closure based on the type and level of use in the area of the beach where the nest was laid:</p> <ul 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>Opposite the surf line on the landward side of the closure, expand the closed area to 15 meters where possible, but no less than 10 meters landward from the nest. Traffic detours behind the nest area clearly marked with signs and reflective arrows.</p> <p>Where present within closure, vehicle tracks manually smoothed with rakes or a steel mat attached to an ATV, so as not to impede hatchlings attempting to reach the surf.</p> <p>Use light filtering fence behind nests nearing hatch dates to block light pollution from the villages and vehicles operating on the beach after dark.</p> <p>If multiple nests are located near each other (within 150 feet), and have similar hatch dates (14 days), then closures will encompass all nests in the area, and will not be removed until all nests within the closure have hatched.</p>
Nest Relocation	<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, staff assesses need for nest relocation and follows relocation guidance identified in the NCWRC handbook.</p> <p>If it is determined the nest will not be relocated, it will be immediately protected with a symbolic fencing and signs and will measure approximately 10 meters by 10 meters in size. Closure size may vary at the discretion of 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>
Light Management	<p>Establish turtle friendly lighting standards and/or reduce light for all Seashore (NPS) structures.</p> <p>Encourage concessioners to install turtle friendly lighting.</p> <p>Develop educational material to inform visitors about their impact on the success of sea turtle nests.</p>

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Research	Support research efforts looking at the sex ratios of sea turtles. 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.
Seabeach Amaranth	
Survey Time and Frequency	August An annual survey of potential habitat will be conducted. Some bird closure areas may not be surveyed due to the potential to disturb nesting birds. Some areas may not be surveyed until just prior to re-opening an area to ORV traffic. July– September Before opening any species closure or identifying alternate ORV corridors, survey for seedlings/plants. End observations when all plants have died back.
Data Collected	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.
Buffers	April 15 – November 30 If a plant/seedling is found outside of an existing closure, the Seashore will 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. If a SBA is found during the survey prior to reopening a bird closure to ORV and pedestrian use, the Seashore will protect the SBA as described above and reopen the areas of the bird closure where no plants exist. Areas reopened if no plants are present by September 1. Where plants occur, the closed areas will be reopened after the plants have died.

See Shorebird/Waterbird Buffer Summary on next page.

Shorebird / Waterbird Buffer Summary

Species	Breeding Behavior/ Nest Buffer	ORV Pass-through	Unfledged Chicks
	SM1 / SM2	SM2 only	SM1 / SM2
Piping Plover	50 m / 50 m	50 m	1000 m / 200-1000 m
American Oystercatcher	300 m / 150 m	Use SM1 or SM2 buffer, based on level of monitoring assigned. Conduct study to determine if a smaller SM2 buffer is adequate for ORV pass-through corridor.	300 m / 200 m
Least Terns	300 m / 100 m	Use SM1 or SM2 buffer, based on level of monitoring assigned. Conduct study to determine if a smaller SM2 buffer is adequate for ORV pass-through corridor.	300 m / 200 m
Other Species CWB	300 m / 200 m	Use SM1 or SM2 buffer, based on level of monitoring assigned. Conduct study to determine if a smaller SM2 buffer is adequate for ORV pass-through corridor.	300 m / 200 m