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**From:** [Pete Benjamin](#)  
**To:** [Mike Murray](#)  
**Cc:** [Patrick Field](#); [David Rabon](#)  
**Subject:** My summary thoughts  
**Date:** 02/10/2009 10:09 AM  
**Attachments:** [20090210\\_CAHA\\_RegNeg\\_Summary.doc](#)

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Mike,

Here is a summary of my thoughts regarding where we stand. I'm providing this for your use as you enter into the "small group" discussions. Let me know what you think.

Mike/Patrick,

If you guys think it would be helpful, I would not object to you guys sharing it with the other members of the "small group". I'd like your feedback on the document first though.

Also Patrick, you mentioned that you'd be calling me at around 11:00 tomorrow regarding migratory birds. Two things: 1) 11:30 would be much better if at all possible; 2) there is a section in the attached that addresses migratory birds that says pretty much what I'd plan on telling the group.

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20090210\_CAHA\_RegNeg\_Summary.doc

Summary Recommendations Regarding Rule Development for the  
Regulation of Off-Road Vehicles at Cape Hatteras National Seashore

Presented By:  
Pete Benjamin

Lead U.S. Fish and Wildlife Service Representative  
to the Negotiated Rule-Making Committee  
February 10, 2009

The purpose of this document is to summarize my views as the primary Fish and Wildlife Service representative on the Negotiated Rule-making Committee regarding the discussions that have taken place over the past year. As a Committee we have learned a great deal about the interests of the various Committee members and the many factors that will influence whatever action the National Park Service ultimately takes, and I feel there is sufficient information to allow me to firmly state my views regarding the type of alternative to which I could offer my consent. My Alternate and I have articulated these views throughout the course of the negotiations; but the flow of the negotiations has been such that we have not yet presented our recommendations comprehensively. This document will attempt to pull our views and recommendations together in a single framework for the benefit of the NPS as you move forward.

To provide context let me say that in evaluating potential alternatives in terms of whether I could offer my consent if the question were put before the Committee I see my decision space as follows. At the low end (non-consent) would be an alternative that would be unlikely (in my estimation) to satisfy basic legal requirements or be within reasonable bounds as indicated by the available scientific information. An example would be an alternative that I think would approach the “jeopardy” threshold or be likely to result in a high amount of avoidable incidental take for one or more listed species. This is a very low bar to clear. Also near this end of the scale would be alternatives that deviate so substantially from existing recovery plans as to be, in my view, unsupported by the best available scientific information. At the high end (hearty consent) would be alternatives through which the NPS would be fully embracing endangered species recovery and conservation as a primary focus. Somewhere in between is a point below which I could not offer consent, as I would not feel comfortable lending the credence of my agency to the plan, but would be equally uncomfortable objecting because the alternative would be likely to meet the bare minimum standards of the statutes and policies under my purview. In that case, I would be inclined to abstain.

### **The Adaptive Management Framework**

Since before the Committee was convened, and throughout its negotiations, I have advocated that NPS apply the concepts of Adaptive Management to the regulation of off-road vehicles at Cape Hatteras National Seashore. Per Secretary’s Order No. 3270, the Department of the Interior supports the use of Adaptive Management where appropriate conditions exist. As identified in the Order and the document “Adaptive Management: The U.S. Department of the Interior Technical Guide,” consideration of Adaptive Management is warranted when: “(a) there

are consequential decisions to be made; (b) there is an opportunity to apply learning; (c) the objectives of management are clear; (d) the value of reducing uncertainty is high; (e) uncertainty can be expressed as a set of competing testable models; and (f) an experimental design and monitoring system can be put in place with a reasonable expectation of reducing uncertainty.”

All of these conditions clearly exist with respect to the ORV issue at CAHA, with the exception of (c) above. Though the NPS has yet to state specific management objectives with respect to ORV management and natural resource management at CAHA, it is obvious that such objectives must be clearly defined. These objectives need to describe NPS goals regarding natural resource conditions and visitor experience in concise, measurable terms.

As I see it, all the alternatives under consideration thus far (including those put forth by the natural resource interest groups) are very permissive in terms of ORV access. Most public lands within the breeding ranges of the subject species close preferred habitat to ORV use (if it is allowed at all) throughout the breeding season. By attempting to meet your obligations to conserve the Seashore’s natural resources while simultaneously affording a high amount of ORV access (including access to sensitive habitat) you are trying to codify something at CAHA that is unique as near as I can tell. If this effort is successful, CAHA would provide a unique visitor experience among East Coast public lands; or more accurately, the continuation of what is a unique experience. I fully understand and support your efforts in this regard. But, at the risk of stating the obvious, balancing these two sets of goals is a very complicated task. I submit that it is too complicated to manage effectively in the absence of a robust Adaptive Management framework.

We have offered to assist NPS in developing natural resource goals and objectives for those species of fish and wildlife under our jurisdiction, recognizing that any decisions regarding adoption of such objectives are the sole purview of the NPS. While continuing to respect your obligations to determine natural resource goals, objectives and management strategies within the Seashore, I offer the following advice regarding appropriate goals and objectives for federally listed species that occur at CAHA in order to provide context and a framework for our overall management recommendations. The following are derived or taken directly from the recovery plans for the listed species occurring within CAHA. These plans represent the state-of-the-science with respect to these species, with the addition of a few references regarding piping plovers that have become available since the plan for that species was last revised in 1996.

### Suggested Goals and Objectives

#### Piping Plovers:

I continue to encourage the NPS to adopt as its goal that you will meet your obligations under Section 7(a)(1) of the Endangered Species Act by contributing to the recovery of this species. This translates into the measurable objectives of managing the CAHA breeding population such that it is approaching the estimated carrying capacity of the habitat within CAHA within the next 10 years, and that productivity is such that CAHA is contributing positively to the Southern Recovery Unit’s recovery criteria. According to Appendix B of the Piping Plover, Atlantic Coast Population, Revised Recovery Plan (1996), the estimated carrying capacity for breeding

pipng plovers at CAHA is 30 nesting pairs. Although this level of breeding activity has not been previously documented at CAHA, I note that the entire period for which reasonably accurate records have been kept at CAHA has been characterized by high levels of relatively uncontrolled human activity resulting in high levels of disturbance during the piping plover breeding season. I further note that NPS units elsewhere in the breeding range exceeded the estimated carrying capacity identified in Appendix B following the implementation of reasonable management measures (e.g., Assateague Island National Seashore. 2006. Management and monitoring of the piping plover, *Charadrius melodus* 2006 breeding season.). Further, we have seen a rapid increase in the number of breeding pairs over the past three years, following implementation of the Interim Strategy and Consent Decree. This indicates to me that habitat availability/suitability is not currently a limiting factor. All this leads me to conclude that 30 nesting pairs is a reasonable objective for CAHA. It also represents an explicit and testable assumption toward which future evaluation, monitoring, and research should be directed (i.e., The carrying capacity for breeding piping plovers at CAHA is 30 breeding pairs). It would be reasonable to adjust this goal modestly based on changed conditions at CAHA since the Recovery Plan was published.

Regarding productivity, the Recovery Plan indicates that an annual rate of 1.5 fledged chicks per pair is needed throughout the breeding range in order to recover the Atlantic Coast piping plover population. The Recovery Plan also indicates that a rate of 1.25 fledged chicks per pair is needed to prevent population declines. While the productivity rates for past years on record at CAHA are generally much lower than these rates (as is the case for all sites in NC), the fact remains that these rates represent the best available scientific information regarding what is needed to contribute to the recovery of the species. So, I suggest 1.5 fledged chicks per pair per year as the recommended objective. As with the population objective above, this objective in and of itself embodies explicit and testable assumptions (i.e., that it is in fact an achievable rate that will provide for a growing population). In addition, many other testable assumptions relate to this measure, which have implications for management. For example, it is known that human disturbance is among the factors that affect productivity, and that management of human disturbance (including but not limited to management of ORV use) is beneficial. Given that management of ORV use is time consuming, costly and controversial, it would be worth assessing the extent to which human disturbance influences productivity relative to other factors. There would also be obvious benefit in exploring the extent to which different types of human activity influence productivity relative to each other and other factors. Additional learning in all of these areas (and others) would help in making better management decisions, and would inform any needed adjustments to the goals themselves.

Regarding non-breeding piping plovers, we know that piping plovers migrate through and winter at CAHA. We also know that while at CAHA these non-breeding birds utilize a mosaic of habitat at and near the Point and spits (both within CAHA and without). We further know that piping plovers spend approximately 70 percent of their annual life cycle in non-breeding status. This leads us to strongly believe that factors affecting survival during the non-breeding season are important to the survival and recovery of the species. All available evidence also indicates that the factors affecting piping plover fitness and survival during the non-breeding season are the same as those factors that have been well documented to affect breeding plovers, including human-caused factors subject to management control at CAHA. Indeed, in a recent study of

Atlantic Canada piping plovers, adult survival during the non-breeding period was considered to be the single most important factor influencing population trends (Amirault et al., 2006; see also Melvin et al., 2006). As such, an appropriate goal would be to address factors subject to management control within CAHA such that the survival and fitness of non-breeding piping plovers is not adversely affected. This translates into an objective of minimizing disturbance of non-breeding piping plovers by human activity within CAHA, and a related objective of minimizing predation of non-breeding piping plovers within CAHA.

#### Sea Turtles:

As with piping plovers, I continue to encourage NPS to embrace your obligations under Section 7(a)(1) of the ESA and establish an explicit goal of contributing to the recovery of federally listed sea turtles that occur at CAHA. Per the newly revised Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle, the recovery criteria for the Northern Recovery Unit (Georgia to Virginia) are: “(1)...statistical confidence (95 percent) that the annual rate of increase over a generation time of 50 years is 2 percent or greater resulting in a total annual number of nests of 14,000 or greater for this recovery unit (approximate distribution of nests is NC=14% [2,000], SC=66% [9,200], and GA=20% [2,800]); and (2) (t)his increase in number of nests must be a result of corresponding increases in number of nesting females (estimated from nests, clutch frequency, and remigration interval). Since CAHA historically accounts for approximately 10 percent of the nests laid in NC, the above range-wide objectives translate into a CAHA-specific objective of 200 nests per year within the next 50 years, with interim benchmarks based on an approximate 2 percent annual rate of increase. As with the goals and objectives for piping plover conservation, a set of testable assumptions are either inherent in or can be derived from this objective.

The criteria in the Recovery Plan focus on nesting females, which makes sense given the biology of this species. However, given that the role of CAHA with respect to sea turtle conservation is limited to nesting habitat, it would be appropriate to also establish objectives related to nesting success. These could be described in terms such as a desired percentage of non-relocated nests that produce hatchlings, or other similar measure. I stress the term “non-relocated” because in terms of conserving listed species we are striving to ensure that the habitat is sufficient to sustain the recovered population level. While nest re-location is a tool available to managers, the focus needs to be on management actions to promote habitat conditions that are favorable for the species’ long-term conservation.

#### Seabeach amaranth:

The NPS should embrace their obligations under Section 7(a)(1) of the ESA and establish an explicit goal of contributing to the recovery of federally listed seabeach amaranth. The recovery criteria identified in the Recovery Plan for Seabeach amaranth (*Amaranthus pumilus*), Rafinesque (1996), state that a “minimum of 75 percent of the sites with suitable habitat be occupied by seabeach amaranth populations for 10 consecutive years.” Cape Hatteras National Seashore has at least four seabeach amaranth sites – Bodie Island spit, Cape Point, Hatteras Inlet spits (Hatteras Island spit and North Ocracoke spit) and Ocracoke Inlet spits (Southern Ocracoke Island spit). Based on the stated recovery criteria, an appropriate goal would be to implement

management control to promote and protect the occurrence of seabeach amaranth, at a minimum, at three of the four identified sites. As with the goals and objectives for the other species, a set of testable assumptions are either inherent in or can be derived from this objective.

### Modeling

Models (empirical or conceptual) are essential components of an Adaptive Management framework. Please refer to page 12 of “Adaptive Management: The U.S. Department of the Interior Technical Guide” for a very good summary of why models are important. From my own experience, models articulate our understanding of how various factors (variables) interact to affect the resource we are attempting to manage. Models allow us to describe the relative importance of each factor, the uncertainty and risks surrounding each factor and its interrelation with other factors, and to make predictions regarding the effects of alternative management approaches relative to stated goals and objectives. Models help us identify which factors have the greatest potential influence on the resource under management (thereby helping to focus management actions) and the areas of greatest uncertainty (thereby helping to focus research needs). Models are essential tools for organizing scientific information, evaluating alternative management actions and selecting preferred options, organizing monitoring efforts, and identifying research needs. Models help pull all these activities together in a consistent, logical and transparent framework that is grounded in science. For these reasons models also facilitate stakeholder understanding and input.

In short, you need models. I have been encouraging you to pursue this course since before the negotiated rule-making process began. I am not an expert in this area, but the Department has people with unquestionable expertise. I have provided NPS with their names. I continue to strongly encourage you to avail yourself of their expertise. If you would prefer, I can contact them on your behalf. To do Adaptive Management right you must do it from the start of a process. You cannot tack Adaptive Management on at the end. The Adaptive Management language currently presented in your November 5, 2008 ORV Management Alternatives represents, at best, half measures that will consume NPS resources without providing useful knowledge upon which to base future management decisions. It is already late in the game, but it is not too late. This situation cries out for the application of Adaptive Management, and models are the heart of an Adaptive Management approach.

### Other Components of Adaptive Management

Without going into detail at this time, you will also need to build a detailed and specific monitoring protocol that will give you the information needed to measure outcomes, learn through doing, and refine your objectives and models. Additionally, you will need to commit resources to research targeted toward reducing uncertainty surrounding the assumptions upon which your models and management plans are based. This opportunity and commitment to learning, to me, represents one of the greatest potential benefits of this endeavor. Indeed the prospect for developing knowledge that could benefit the conservation of these species range-wide is a primary factor enabling me to consent to a management approach that varies substantially from those described in the recovery plans for these federally listed species.

A final thought regarding Adaptive Management: it requires stakeholder involvement. This is in part why I said earlier that it is already late in the game, even though a final rule is not due until Spring 2011. The Committee's work is near its end, but I think you are going to need some forum or body to afford continued stakeholder involvement throughout the remainder of this rule-making and beyond into implementation of any plan ultimately adopted.

### **My Bottom Line**

The preceding was lengthy but necessary in order for the following specific comments and recommendations to be understood in their proper context. Specifically, IF the NPS were to embrace goals and objectives similar to those outlined above, commit to doing what is necessary to reach those goals, and commit to pursuing those goals via a true Adaptive Management framework, then, it would make little difference to me what specific actions you decide to employ at any given time on any given beach. Under such conditions I would be confident that you were using the best available science and an effective set of decision-support tools to help guide your day-to-day management decision-making. In short, I would be likely to consent to any alternative that embraces the above principles. Conversely, I will likely find it very difficult to consent to any alternative that does not. As I see it, you have an opportunity here to build something really new and substantial that would truly integrate science, management and stakeholder involvement. Missing this opportunity would represent a substantial loss in my view, and a substantial departure from the kind of science-based decision making that my agency advocates. This would likely prevent me from offering my consent, and the best I'd be likely to offer the Committee would be my abstention.

Nonetheless, with science-based decision making in an Adaptive Management environment, you start with what you know or think you know and work from there. As such, I offer the follow site-specific recommendations as a summary of what the current state of the science indicates or suggests, as taken from the recovery plans for these species.

### **Specific Management Recommendations**

Actions to protect federally threatened and endangered species, by law, must be based on the best scientific information available. (Measures to protect non-listed natural resources also should be based on the best scientific information available.) As stated above, the best scientific information for listed species is generally encapsulated in the species' recovery plan. For older recovery plans, additional, more recent, scientific literature was considered in the development of these protective measures. Literature cited in the recovery plans are incorporated by reference. Additional literature not cited in the recovery plans is referenced below.

#### Piping Plover

The protection measures for the piping plover are drawn largely from Appendix G of the piping plover Recovery Plan (1996) which is limited to prohibitions of take under section 9 of the ESA, and may not include measures to satisfy potential legal mandates under other portions of the ESA (e.g., section 7) or Executive Orders (e.g., 11644 and 11989). Furthermore, Appendix G is

primarily guidance for the protection of breeding piping plovers. Additional information is provided for non-breeding piping plovers.

Pre-nesting Areas:

All suitable piping plover nesting and courtship habitat should be identified by a qualified biologist and delineated with symbolic fencing consisting of wooden posts, bird usage signs, strings, and flagging tape on or before 15 March each year. Pre-nesting areas should include the areas of moist soil habitat, permanent and ephemeral ponds or pools, ocean backshore, dunes, dry sand flats, overwashes, blowouts, and the ocean tidal zone.

All vehicular access into or through posted nesting habitat should be prohibited.

Monitoring should be conducted at least once every two days from 15 March to 15 April, and then daily from 16 April to 15 July, to determine if any birds are exhibiting pre-nesting and/or breeding behavior.

The pre-nesting areas should remain in place until the later of 15 July or two weeks after the last shorebird (e.g., least tern, black skimmer, American oystercatcher, or Wilson's plover chick) within the area has fledged and no other nesting activities by any species are observed, as determined by two consecutive monitoring events conducted over at least two days. [Other shorebirds are selected here as a measure to determine the last nesting activity because piping plovers may be difficult to detect.]

All unposted sites should be posted immediately upon detection of breeding behavior (i.e., within the same day), including but not limited to territorial behavior, courtship, mating, scrapes, or other nest-building activities.

These recommendations are essentially similar to the measures identified in your November 5, 2008, CAHA ORV Resource Protection Tables, Species Management 1 (SM1) and Species Management 2 (SM2). A potentially significant difference between the above and SM1/SM2 is the distinction between "recent breeding area" and "all potential habitat." We do not understand the practical difference, and recommend that "all potential habitat" be treated the same. We also recommend that instead of stating that pre-nesting closures will be "removed" following cessation of nesting activity, that they will be "rolled back" to become "non-breeding buffers".

As applied to specific sites within CAHA, we recommend the following modifications to the proposed SM2 procedures.

At Bodie Island, much of the best foraging habitat is the wet sand and ephemeral pools near the inlet. Maintenance of a corridor around the entire inlet would result in a high probability of disturbance of pre-nesting birds in the inlet area. We would recommend that baseline management be to terminate the corridor at the point of the inlet/ocean interface beginning March 15. Also, it appears possible to maintain a narrow access corridor to the northwest corner of the "bait pond".



At South Beach, monitoring data are sparse but the condition of the habitat indicates that the area provides suitable and potentially valuable foraging habitat for pre-nesting plovers. As such we recommend as baseline management conditions the opening of a back dune road with parking and walk-overs.

At Hatteras Inlet, we recommend as the baseline management condition establishment of a high beach corridor from where the spur roads empties onto the ocean beach to the vicinity of the inlet, in order to provide some undisturbed ocean intertidal foraging habitat.

At South Ocracoke, similar to Bodie Island spit, we recommend as the baseline management condition that you terminate the corridor at the point of the inlet/ocean interface beginning March 15.

At this point I think it may be useful to illustrate the type of decision-making that could be achievable under a robust Adaptive Management framework. This is just an example for illustration purposes, and it is very simplistic in that it only considers piping plover pre-nesting habitat management. Nonetheless, let's assume that the population objective for breeding piping plovers is 30 nesting pairs, based on the numbers provided in Appendix B of the Recovery Plan. Let's also assume that it is March 2012 and during the 2011 breeding season there were 20 pairs of plovers as follows: Bodie Island 3; Cape Point 10; Hatteras Spit 2; Ocracoke (north and south) 5. Assuming that we have done some analysis and affirmed that the numbers from Appendix B remain reasonable site-specific targets (again being simplistic) then it would be reasonable to conclude at the beginning of the 2012 season that Cape Point is approaching its projected carrying capacity, and presumably there is relatively limited opportunity for additional population growth here as compared to Ocracoke or Bodie Island. So a reasonable management response would be to implement SM2 management at Cape Point with the intent of maintaining access to the greatest extent possible without experiencing a decline in the number of breeding pairs (i.e., the site-specific objective is to hold the population steady at Cape Point). At the same time you would be implementing SM1 standards at Bodie Island and Ocracoke; predicting that these sites offer the best opportunities for continued growth toward your overall objective. I feel that this type of management is only achievable after you have built the Adaptive Management framework through which you have documented your assumptions and established reasonable science-based goals and objectives; have developed models that enable you to make detailed predictions regarding the effects of management actions, characterize uncertainty, evaluate risk, and that provide a framework for assimilation of monitoring data and research findings; and have clearly defined management protocols that have been carefully refined through experience and knowledge.

#### Protection of Nests:

The recovery plan suggests that a 50 meter buffer around a piping plover nests will be adequate to prevent harassment of the majority of incubating piping plovers, but also acknowledges that available data indicate that larger buffers are needed in some locations of the plover's Atlantic Coast range, especially in the Southern Recovery Unit. At this time we recommend that a 50 meter-radius around nests above the high tide line should be delineated with warning signs and symbolic fencing and all non-essential access (pedestrian and vehicles) prohibited. However, we

strongly encourage the NPS to evaluate whether this buffer is sufficient to protect the nests and whether such a buffer will allow them to meet stated goals. We also recommend that the NPS reference Assateague Island National Seashore's Piping plover Management Plan (1993) for additional information on increasing nest site buffers.

Prior to hatching, vehicles may pass by plover nests along designated vehicle corridors established along the outside edge of plover nesting habitat as long as a 50 meter buffer remains between the vehicle corridor and the nest. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers are disturbed by passing or parked vehicles or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

Only persons engaged in rare species monitoring, management, or research activities should enter posted areas. These areas should remain fenced as long as viable eggs are present. Fencing around nests should be expanded in cases where the standard 50 meter-radius is inadequate to protect incubating adults or eggs from harm or disturbance.

In cases where the nest is located less than 50 meters above the high tide line, fencing should be situated at the high tide line, and a qualified biologist should monitor responses of the birds to passersby, documenting his/her observations in clearly recorded field notes.

If nests are discovered outside fenced areas, fencing should be extended to create a 50 meter buffer to prevent disturbance to incubating adults, eggs, or unfledged chicks.

These preceding recommendations are similar to the measures identified in your Resource Protection Tables, SM1 and SM2. A notable difference between the above and SM1/SM2 is the closure that results from a nest buffer that falls within the intertidal zone. We commend your proposal to implement a full beach closure under such circumstances and do not necessarily advocate for less should you feel that a complete closure is warranted. However, we note that a less restrictive (to access) buffer that extends to the high tide line is a potentially plausible alternative that can be explored as sufficiently protective using Adaptive Management. Another potentially significant difference between the above and SM1/SM2 is the distinction between "nests occurring outside existing closures" and those occurring within existing closures. We recognize that a 50 meter nest buffer likely will be encompassed within the existing closure, but we recommend that nests be evaluated to ensure at least a 50 meter buffer around the nest is maintained.

As applied to specific sites within CAHA, we recommend corridors as described above, subject to closure by nest buffers. However, the illustrative type of decision-making scenario described above regarding the implementation of SM2 at Cape Point could be applied in providing additional access through the intertidal zone. Once again, though, this type of management is only achievable after you have built the Adaptive Management framework through which you have documented your assumptions and established reasonable science-based goals and objectives; have developed models that enable you to make detailed predictions regarding the effects of management actions, characterize uncertainty, evaluate risk, and that provide a

framework for assimilation of monitoring data and research findings; and have clearly defined management protocols that have been carefully refined through experience and knowledge.

#### Protection of Chicks:

Sections of beaches where unfledged piping plover chicks are present should be temporarily closed to all vehicles not deemed essential. Areas where vehicles are prohibited should include all dune, beach, and intertidal habitat within the chicks' foraging range.

A vehicle free area should extend 1000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 2000 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists.

A pedestrian free area should extend 300 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 600 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists.

A monitoring program should be implemented to gather basic data on location, population size, foraging areas, and success of breeding piping plovers and other imperiled species. However, this type of monitoring program is not a sufficient replacement for the implementation of Adaptive Management.

These recommendations are essentially similar to the measures identified in your Resource Protection Tables, SM1 and SM2. A potentially significant difference between the above and SM1/SM2 is the uncertainty of the buffer zone to protect piping plover chicks. In SM1 a 1000 meter buffer is established “based on observation of bird behavior and terrain conditions” at each site. Exactly how do these conditions (bird behavior or terrain conditions) determine whether a 1000 meter buffer is needed and what is the alternative? Similarly, under SM2 the buffer is reduced (to 500 meter for ORVs, and 200 meters for pedestrians) two weeks after hatching, and once again observed behavior of the brood determines whether a reduced buffer can be employed. We do not understand the reasoning for reducing established buffers with minimal observations (e.g., once daily for SM1) or after a set period of time (e.g., two weeks after hatching for SM2) when such criteria offer little information on the effects of the management action. We recommend a 1000 meter buffer be established in all situations. We also recommend that Adaptive Management be used to determine when and under what conditions an alternative buffer might be warranted. As applied to specific sites within CAHA, we recommend corridors as described above, subject to closure by buffers to protect chicks.

#### Timing of Vehicle Restrictions in Chick Habitat:

Restrictions on the use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on 15 May (the earliest probable hatch date). If the nest is discovered after 15 May, then restrictions should start immediately. If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If the nest is monitored at least twice per day, at dawn and dusk by a qualified biologist, vehicle use may continue until hatching begins, subject to the protection buffers discussed above and the nighttime restrictions below. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

If ruts are present that are deep enough to restrict movements of plover chicks, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

The above recommendations for the protection of chicks are generally similar to the SM1/SM2 measures identified by NPS. Regarding the language that states: "Points and spits would only be accessible from 7 a.m. - 7 p.m. as long as unfledged chicks are in the area and if buffers can be maintained. The 7 a.m. opening may be delayed until the chicks have been located." We recommend that the phrase "Points and spits" be replaced with "Areas with unfledged chicks", and that the 7 am to 7 pm timeframe be adjusted to be consistent with the Sea Turtle protection measures in the effected area, using which ever is the more restrictive.

#### Non-breeding Areas:

Suitable interior habitats should be closed to pedestrians and vehicles year-round with a 100 meter buffer to vehicle and pedestrian use to protect essential resting and foraging habitats. Access to the Point or spits would be maintained. These areas in conjunction with the nearby islands would provide valuable high beach roosting habitat as well as sound side intertidal, mudflat, and ephemeral moist sand foraging habitat. Additionally, since we know that non-breeding piping plovers use a mosaic of habitat within a few kilometers of the Point and spits, and that it is important to maintain access to all habitat types (including ocean intertidal habitat) we would recommend that efforts be made to provide disturbance-free ocean intertidal habitat in the vicinity of the Point and the spits. This could be in the form of high beach ORV corridors and/or inter-dunal roads that route vehicles around select areas of ocean inter-tidal habitat. I do not believe we know enough at this time to determine objectively how much of this habitat type is needed to sustain non-breeding birds or where specifically the preferred ocean intertidal

foraging habitat is located (other than to say it is in the general vicinity of the Point (specifically South Beach) and the spits). As such, I would recommend that every effort be made to provide this habitat, and I would also agree that there is insufficient evidence to support complete closure of any area to ORV access for the purpose of providing undisturbed ocean intertidal foraging habitat at this time.

A monitoring program should be implemented on the 5<sup>th</sup>, 15<sup>th</sup>, and 25<sup>th</sup> of each month to gather basic data on location, population size, and habitat use by non-breeding plovers as well as other important shorebirds. The non-breeding plover season extends from 1 July to 31 May. However, this type of monitoring program is not a sufficient replacement for the implementation of Adaptive Management.

These recommendations are similar to the measures identified in your Resource Protection Tables, SM1 and SM2. A potentially significant difference between the above and SM1/SM2 is the difference between available ocean intertidal habitats. Another potential difference between the above and SM1/SM2 is the monitoring of non-breeding piping plovers. We understand the difficulties of identifying and distinguishing migrating piping plovers from nesting piping plovers during the spring and fall. However, the proposed monitoring may miss two to three months of the migration period, and thus important information on the use of CAHA by migrating piping plovers. We recommend that surveys for non-breeding piping plovers begin on 1 July according to the schedule describe above and continue through 31 May, noting that numbers during the “shoulder” months may include breeding birds. Furthermore, we recommend that all piping plover habitats be monitored rather than just “pre-established locations” to truly understand the use of CAHA by non-breeding piping plovers.

#### Other Measures:

Notwithstanding the thoughtful and impassioned advocacy by fellow Committee members on behalf of “man’s best friend”, the hard fact is that dogs pose a serious threat to beach-nesting birds and sea turtle nests. As such, pets should be prohibited within all natural resources closure areas and should not be permitted within 100 m of any resource closure area between 1 April and 15 November. Furthermore, pets should be leashed and under the control of their owner at all times. Perhaps there is an opportunity to create more “pet friendly” beaches elsewhere within CAHA, or to work with the villages and/or counties to provide such amenities within the broader Outer Banks community.

Kite flying should be prohibited within 200 meters of all piping plover nesting or territorial adult or unfledged juvenile piping plovers between 1 April and 31 August.

Fireworks should be prohibited on beaches where piping plovers nest from 1 April until all chicks are fledged.

#### Other Beach-Nesting Birds

I am going to continue to demure from making any site specific recommendations regarding management of other beach nesting birds, because I feel that others on the Committee, such as

the NC Wildlife Resources Commission, have far greater site-specific knowledge than do we. However, I will say generally that protection of these species is warranted and should be done within the same Adaptive Management framework described above; although it appears to me that there is relatively less readily available information upon which to base specific objectives for these species, which may make developing a framework somewhat more complicated – though not impossible. Also, I am willing to assist you in attempting to reconcile the differences that exist between the ORV groups' recommendations and the Environmental groups' recommendations at those areas other than the spits and the Point (e.g., the area north of Avon and the ocean beach along Ocracoke). It is these areas where non-listed species (i.e., beach nesting and non-breeding birds other than piping plovers) appear to be driving the discussion. In these areas I tend to lean to the side of the ORV groups in that it seems reasonable to designate routes through these areas SO LONG AS it is clearly understood that those routes are subject to closure (including potential pre-nesting closures). I have heard several representatives from the ORV groups state repeatedly that this is understood. Under an Adaptive Management framework a decision process similar to the above example could be used to determine which of these areas would be subject to pre-nesting closures during a given season, and I like the idea of a management approach that is progressively more permissive to access as milestones toward objectives are achieved.

### Sea Turtles

The protection measures for sea turtles are drawn largely from the second revised (2008) loggerhead recovery plan, and from the Volusia County HCP (2008). Nighttime restrictions are based on emergence data of sea turtles presented in Neville et al. (1988) and Witherington et al. (1990). Protection measures may differ for different sea turtle species. The following measures do not preclude implementation of additional measures to protect those species.

A monitoring program also should be implemented to gather basic data on nesting locations, population size, nesting success, and hatching success of sea turtles. However, this type of monitoring program is not a sufficient replacement for the implementation of Adaptive Management.

#### Protection of Nesting Areas, Nests, and Hatchlings:

Surveys should begin monitoring for nesting sea turtles beginning 1 May and continue through 31 August (or two weeks after the last sea turtle nesting activity is found, whichever is later). All sea turtle nests should be located each morning, assessed according to NCWRC guidelines (2006), and immediately posted with symbolic fencing. The sea turtle closure should be a minimum of 10 meters by 10 meters around the nest.

At day 50 of the incubation cycle, the closure should be expanded to encompass the area 20 meters duneward of the nest site down to the tide line. The width of the closures (running parallel to the shoreline) also should be expanded to 25 meters each side of the nest. The nest sites should be monitored daily for hatching activity after day 50 of the incubation cycle.

Silt fencing should be installed at day 50 of the incubation cycle if any sources of light pollution from villages or other structures have the potential to disorient hatchlings. The fencing should be placed in a “U” shape behind the nest and extend oceanward to the high tide line. Vehicle ruts that have the potential to impede hatchlings emerging from nests and attempting to reach the ocean must be removed.

Light Restrictions:

Lanterns or auxiliary lights and fixed lights of any kind burning for more than 5 minutes should be prohibited on beaches from 1 May through 15 November.

Campfires should be prohibited from 1 May through 15 November.

Night Driving Restrictions:

The following recommendations regarding night driving are the major difference between our recommendations for baseline management and the SM1/SM2 proposal. These recommendations are based on our current state of knowledge and as such we recommend them as the baseline against which other options should be evaluated. In general, night time vehicular traffic on nesting beaches should be minimize and controlled to protect sea turtles engaged in nesting behavior, their nests, and their young.

From 1 May through 15 November, all non-essential vehicles should be prohibited on the beach from 10 pm until the following morning. The beach will be opened to non-essential vehicles each morning only after being checked for nesting activity and after new nests have been adequately protected by the sea turtle patrol staff.

From 1 September through 15 November, National Park Service may authorize and regulate non-essential vehicle access after 10 pm (until the next morning) if the beach is continuously patrolled throughout the night by sea turtle patrol staff during those hours. The patrols should look for all hatching activity, including monitoring for unknown nests, and potential late season nesting activity. If vehicle access is granted during the period from 1 September through 15 November, light restrictions must remain in effect.

From 16 November through 30 April, the beach is open to all non-essential vehicles in accordance with National Park Service policies.

It is my view that these recommendations could be modified considerably if put into the broader context of overall light management throughout Dare County.

Seabeach Amaranth

The protection measures for Seabeach amaranth are drawn largely from the species’ recovery plan (1996). The following measures do not preclude implementation of additional measures to protect the species.

Potential suitable seabeach amaranth habitat in the vicinity of the inlet spits and Cape Point should be identified by a qualified biologist and delineated with symbolic fencing consisting of wooden posts and string on or before 1 June. We recognize that these areas may be encapsulated within shorebird nesting areas and may not warrant additional symbolic fencing. However, protections for seabeach amaranth plants should not be removed before the plant has senesced (typically 1 December).

These recommendations are similar to the measures identified in your Resource Protection Tables, SM1 and SM2. A potentially significant difference between the above and SM1/SM2 is the protection of potential suitable seabeach amaranth habitat in the vicinity of the Point and spits and outside of existing resource closures. We recommend that “potential habitat” in these areas be protected, especially if they lay outside of other resource closures. We also recommend that seabeach amaranth areas within other resource closures be protected using symbolic fencing following cessation of nesting activity or otherwise any opening of the “other” natural resource closure.

## **Conclusion**

To sum up, the above specific recommendations and comments are provided to illustrate how our current state of knowledge applies to the specific conditions that exist within CAHA, and should represent the starting point from which future decisions are made under an Adaptive Management framework. All that said, I reiterate that it really would not matter to me what specific measures were implemented on a given beach at any given time if NPS were to embrace the goals and Adaptive Management principles identified above. However, I caution that our state of knowledge regarding management of these species is relatively advanced. These recommendations are founded on a relatively robust body of scientific research and management experience. While I think you may be able to avoid “jeopardy” doing otherwise, unless you embrace the Adaptive Management approach I have advocated you will have a very difficult time producing credible scientific justifications for deviating substantially from these recommendations while meeting the NPS mandates of avoiding adverse impacts. The “balance” for which you strive is a worthy goal, and I will continue to support you to the best of my ability. But it is a very ambitious goal and you are going to need to make effective use of the very best tools at your disposal to reach it, and in my mind Adaptive Management is the best tool for this job.

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