

**NEGOTIATED RULEMAKING COMMITTEE**  
**10th Regulatory Negotiation Meeting**  
**Wright Brothers Memorial, Kill Devil Hills, NC**  
**January 6-7, 2008**

**Draft Final Agenda**

**Objectives**

- Updates since last meeting
- Clarify Committee role on natural resources and NPS expectations
- Subcommittee and caucus meetings to refine proposals and narrow issues
- Reach conditional consensus on as many issues as possible
- Identify additional Subcommittee work during January
- Provide opportunity for public comment
- Other?

Tuesday, January 6

- 8:00            Gathering and Coffee
- 8:30            Welcome to All and Opening of the Meeting, *Mike Murray, NPS, Designated Federal Official (DFO)*
- 8:35            Review Meeting Objectives and Agenda, *Facilitators and Agenda Planning Subcommittee*
- 8:40            Brief Updates Since the Last Meeting and Approval of Meeting Summaries
- 8:50            NPS clarifies Committee Role, Expectations, Deadline, NEPA, etc.
- 9:50            Break
- 10:05          Subcommittee Discussions
- Permits, Passes, Fees
  - Natural Resources
  - Routes and Areas
  - Village Closures
- (Committee members and alternates who are not on a subcommittee are requested to observe and contribute through a subcommittee member)
- 12:00          Public Comment  
(up to 4 minutes per person, with 5 minutes total at the end of the public session for a brief response from Committee members to the public comments)
- Specific comments are requested on the following --*
- Routes and Areas proposals
  - Proposals discussed in Subcommittee meetings
- 12:45          Working Lunch in Caucuses (*provided for principals and alternates*)
- 1:30            Continue Subcommittee Meetings  
(Note: Permits, Passes, Fees is expected to complete its work in the AM)

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12/29/08

- 3:30 Caucus Meetings
- 4:30 Check in to prepare for Day #2
- 4:50 Break
- 5:00 Additional Public Comment Session (*if not completed before lunch*)  
(*up to 4 minutes per person, with 5 minutes total at the end of the public session for a brief response from Committee members to the public comments*)
- Following Public Comment Adjourn for the Day
- 6:30 Key Subcommittee Members and Facilitators Prepare Write Ups for Day #2


Wednesday, January 7

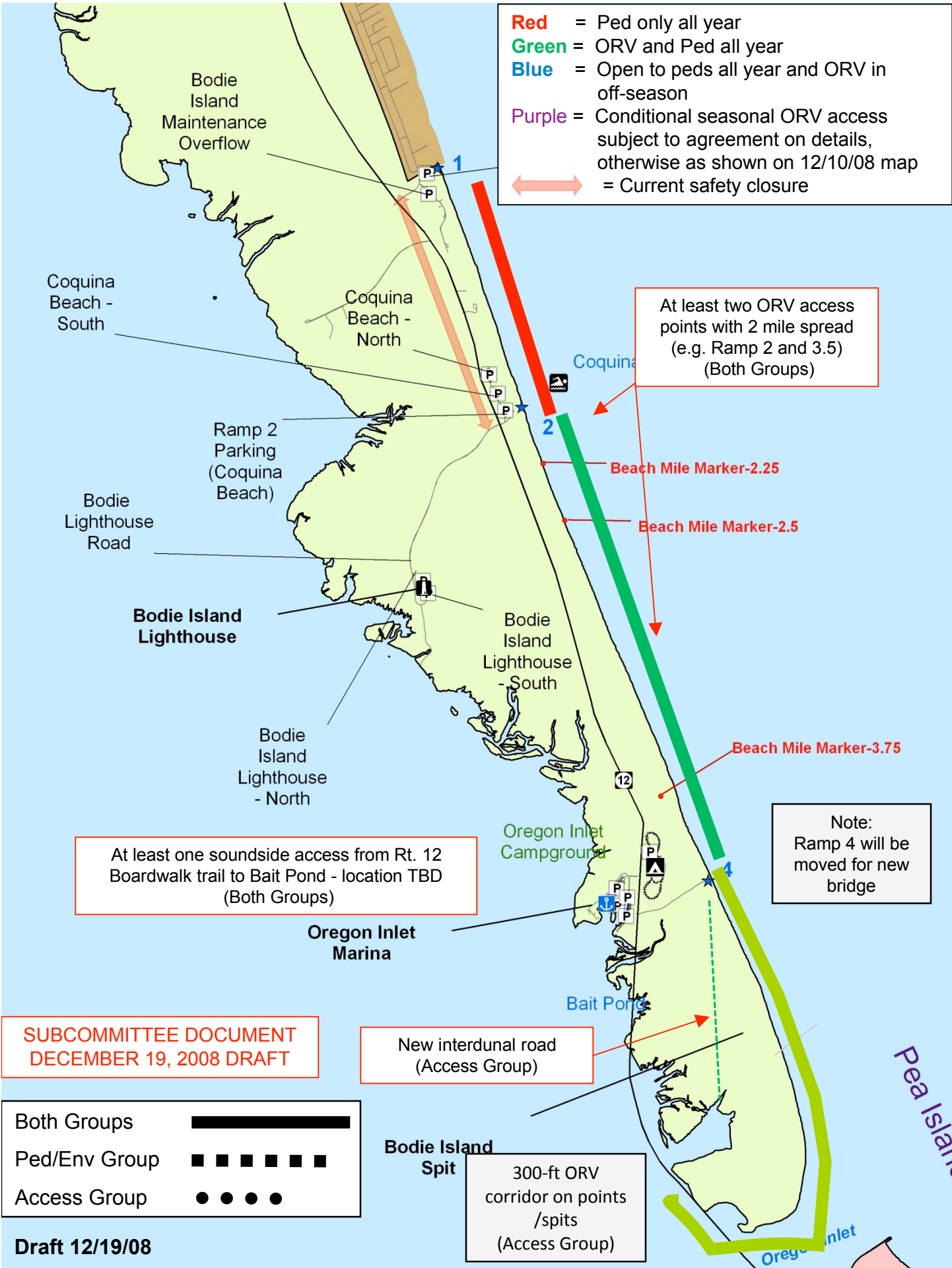
- 8:00 Gathering and Coffee
- 8:30 Agenda Review
- 8:35 Reports from Subcommittees and Plenary Discussion
  - What's promising
  - Consensus
  - Disagreements and reasons
- 10:45 Break
- 12:00 Public Comment  
(up to 4 minutes per person, with 5 minutes total at the end of the public session for a brief response from Committee members to the public comments)
- Specific comments are requested on the following --*
  - What's promising and why?
  - What should be changed and why?
- 12:45 Working Lunch in Caucuses (*provided for principals and alternates*)
- 1:15 Continue Committee Discussion
- 2:45 Subcommittee Meetings to identify issues and work and scheduling
- 3:45 Check-in and Planning for January 21-22 Meeting
- 4:00 Adjourn

**ORV Routes and Areas Subcommittee**  
**ORV Routes and Areas and Pedestrian Areas Maps**

**December 19, 2008 DRAFT**

- The proposed Routes and Areas shown on the following maps are not to scale. Proposed interdunal roads are shown as a placeholder and do not reflect actual locations. Safety Closures shown on the maps are based on the 09/08 Beach Access Report.
- *The maps do not reflect Committee consensus or individual Committee member concurrence on the specific terms, provisions, or locations.*

**Red** = Ped only all year  
**Green** = ORV and Ped all year  
**Blue** = Open to peds all year and ORV in off-season  
**Purple** = Conditional seasonal ORV access subject to agreement on details, otherwise as shown on 12/10/08 map  
 = Current safety closure



At least one soundside access from Rt. 12 Boardwalk trail to Bait Pond - location TBD (Both Groups)




At least two ORV access points with 2 mile spread (e.g. Ramp 2 and 3.5) (Both Groups)

Note: Ramp 4 will be moved for new bridge

SUBCOMMITTEE DOCUMENT  
 DECEMBER 19, 2008 DRAFT

New interdunal road (Access Group)


300-ft ORV corridor on points /spits (Access Group)

Both Groups   
 Ped/Env Group   
 Access Group 

Draft 12/19/08



0076232

**Red** = Ped only all year  
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Re-establish Ramp 20  
 Establish Ramps 24, 25, 26, 28, 29  
 (Access Group)


Sound-side Access - Status Quo with  
 minimal maintenance  
 (Both Group)

Sound-side: Ramps 46, 48 open for Ped  
 and ORV access (Access Group)

SUBCOMMITTEE DOCUMENT  
 DECEMBER 19, 2008 DRAFT



0076233

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Little Kinnakeet

Establish Boardwalk (Both Groups)

Sound-side: Ramps Little Kinnakeet (1, 2, 3) and 52, 53, 54 open for ped and ORV access (Access Group)

Establish new Ramp 32 across from Little Kinakeet Station parking area (Both Groups)

Avon

Avon Pier

See narrative for proposed sound side access from south of Avon to Hatteras Inlet (Access Group)

Both Groups

Ped/Env Group

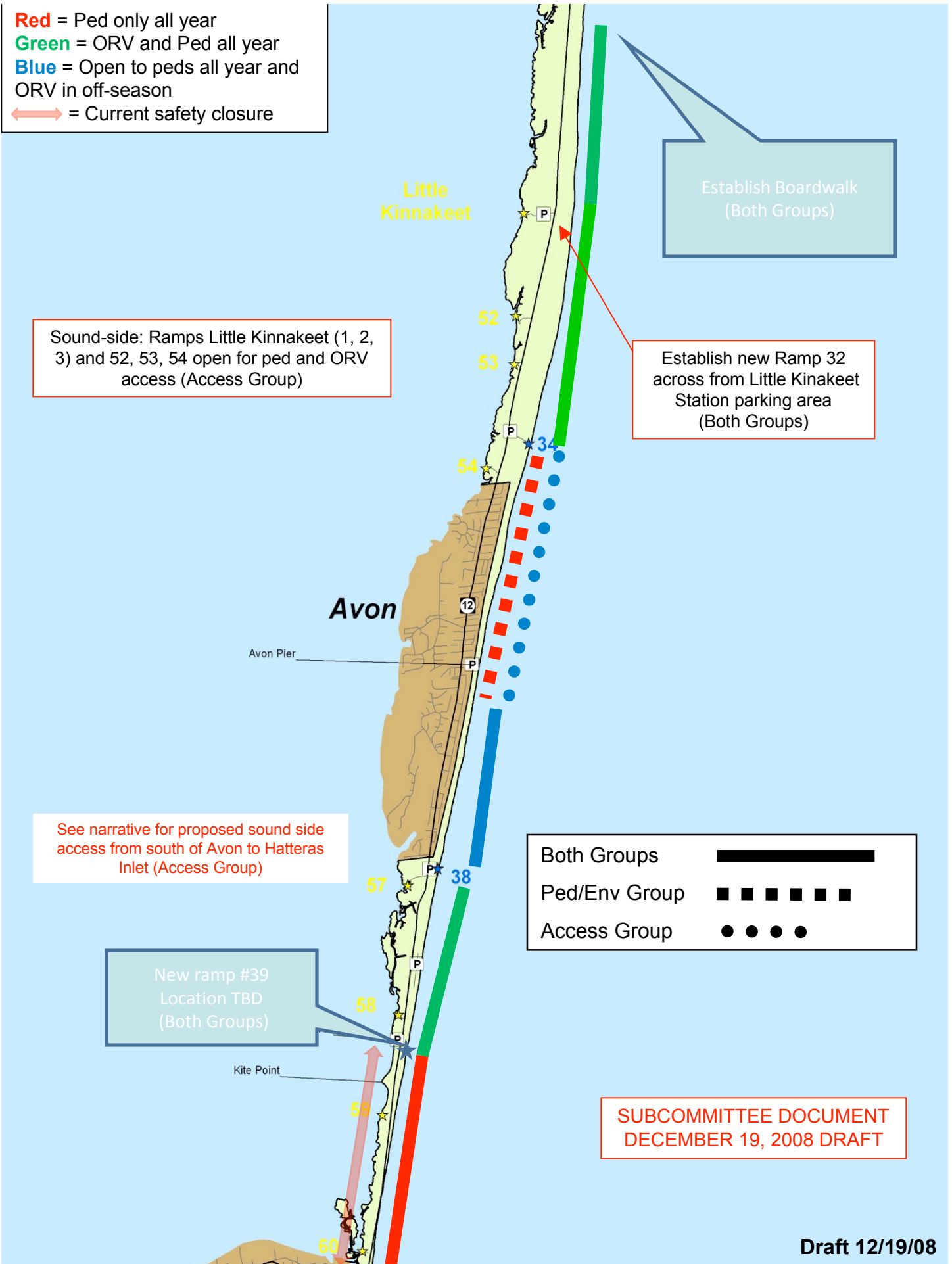
Access Group

New ramp #39 Location TBD (Both Groups)

Kite Point

SUBCOMMITTEE DOCUMENT  
DECEMBER 19, 2008 DRAFT

Draft 12/19/08



SUBCOMMITTEE DOCUMENT  
DECEMBER 19, 2008 DRAFT

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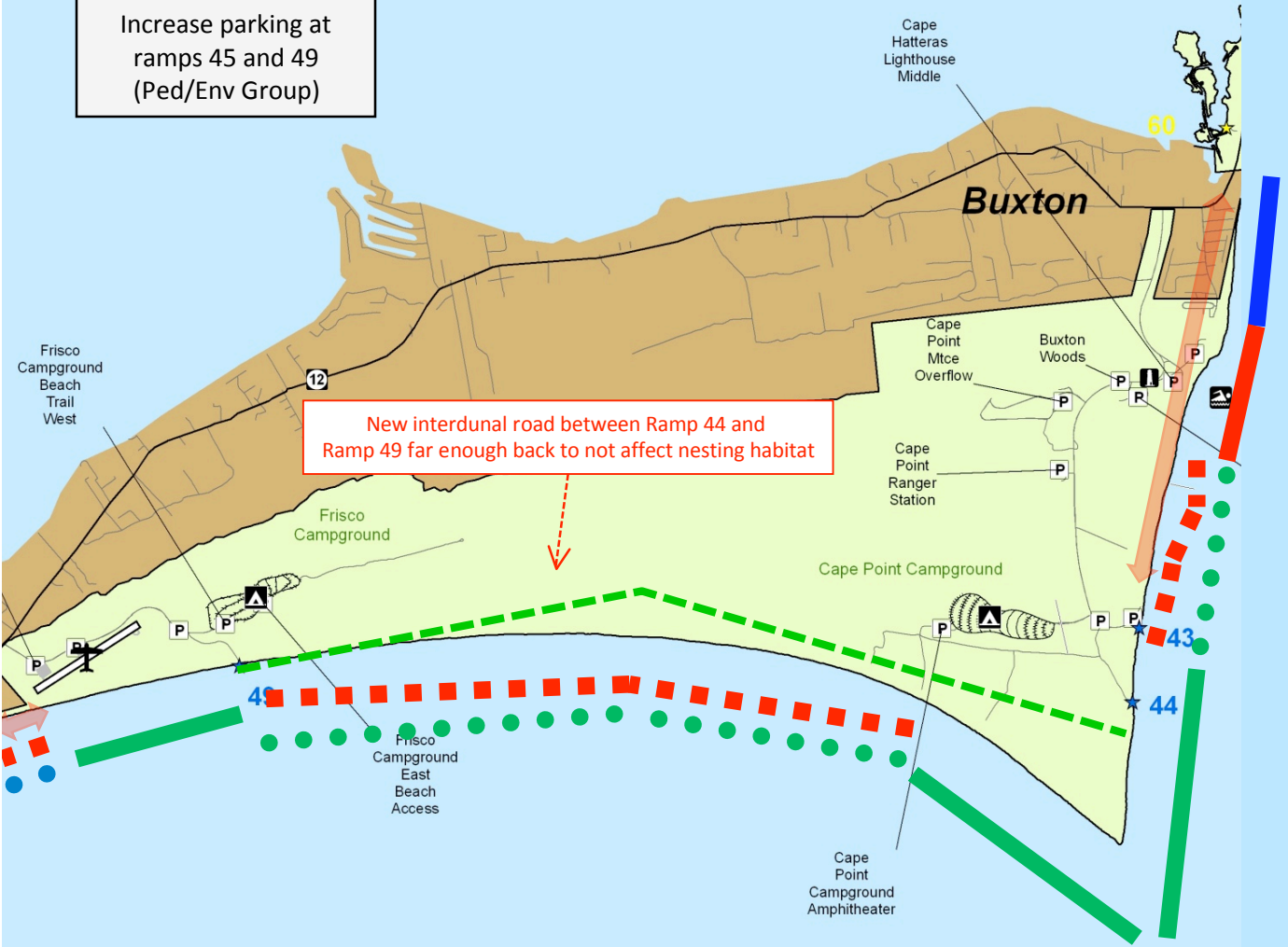
Add Ramp at South End of Village Boundary if feasible (Access Group)


Increase parking at ramps 45 and 49 (Ped/Env Group)

New interdunal road between Ramp 44 and Ramp 49 far enough back to not affect nesting habitat

300-ft ORV corridor on points /spits (Access Group)

Both Groups	▬
Ped/Env Group	■ ■ ■ ■ ■
Access Group	● ● ● ●

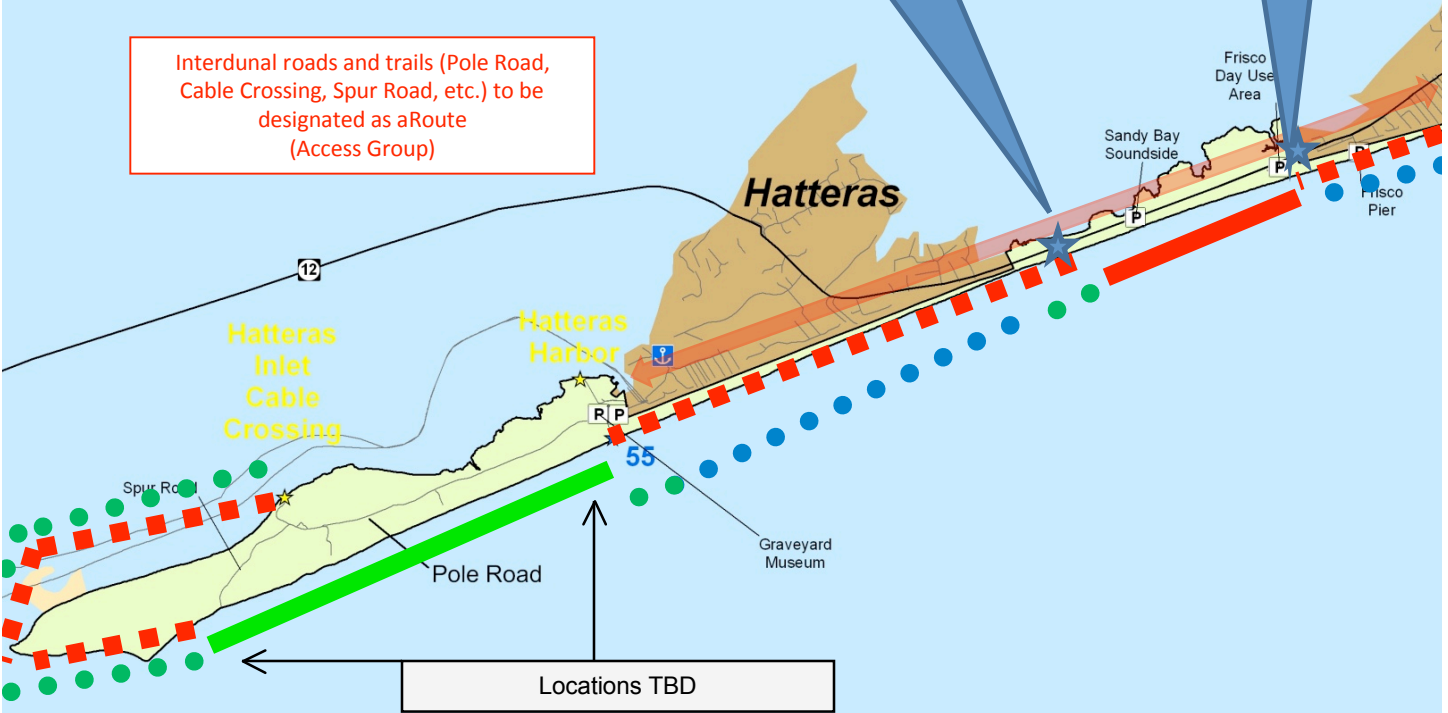


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Interdunal roads and trails (Pole Road, Cable Crossing, Spur Road, etc.) to be designated as a Route (Access Group)




New ramp #52 (Access Group)

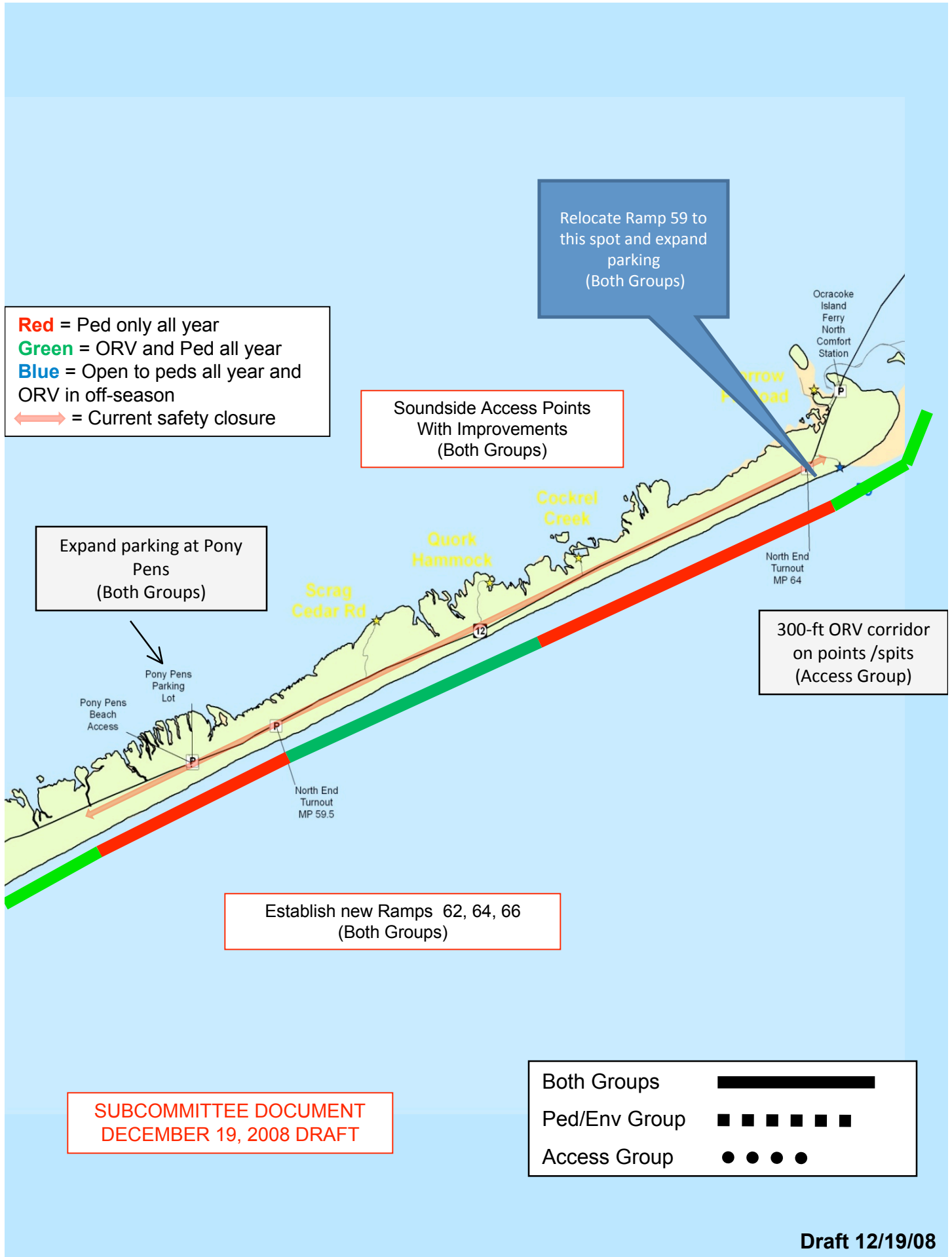
New ramp #51 (Both groups)



300-ft ORV corridor on points /spits (Access Group)

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 DECEMBER 19, 2008 DRAFT

Both Groups	
Ped/Env Group	
Access Group	



Relocate Ramp 59 to this spot and expand parking (Both Groups)

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 ← → = Current safety closure

Soundside Access Points With Improvements (Both Groups)

Expand parking at Pony Pens (Both Groups)


300-ft ORV corridor on points /spits (Access Group)

Establish new Ramps 62, 64, 66 (Both Groups)

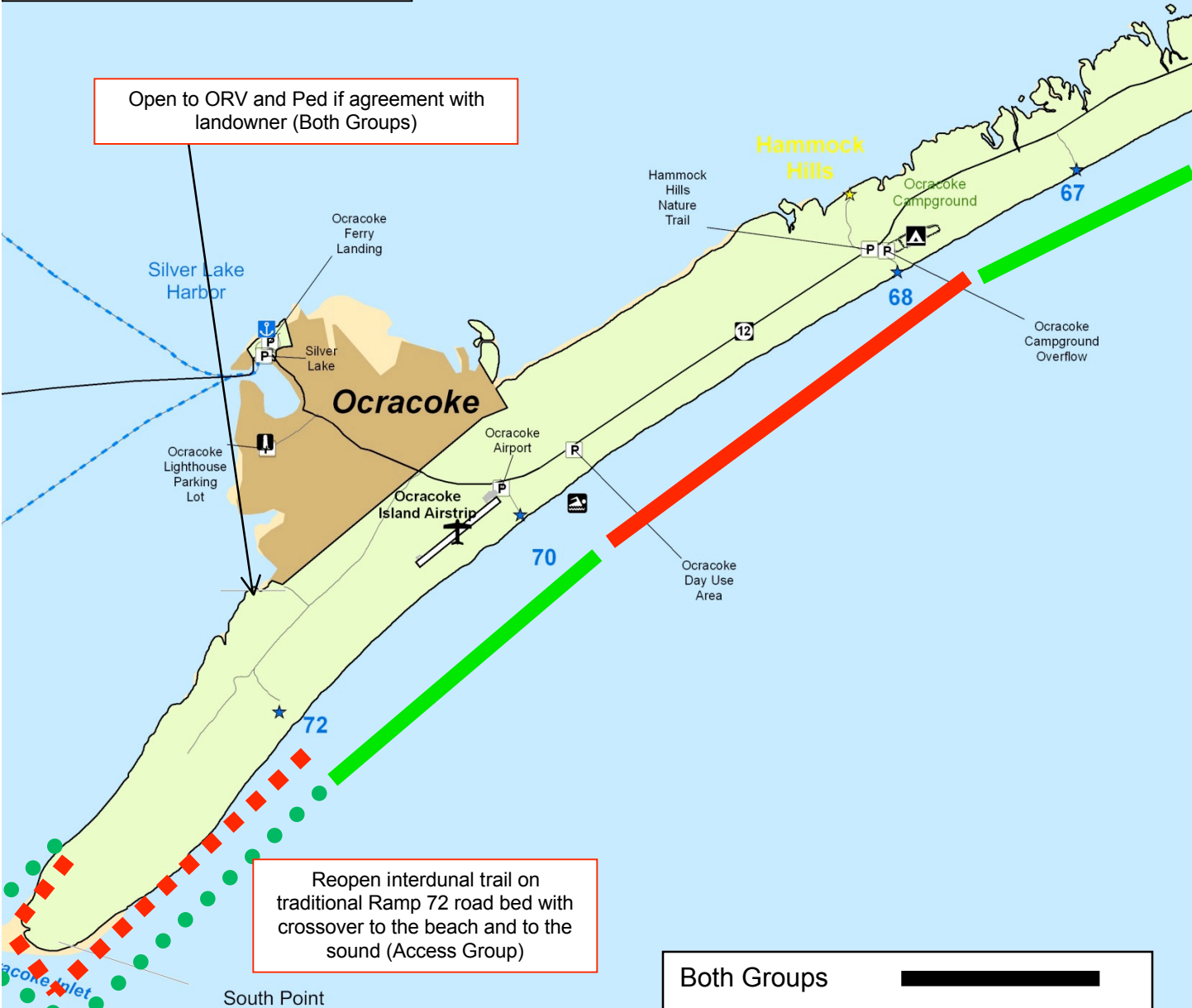
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 DECEMBER 19, 2008 DRAFT

Both Groups      **—————**  
 Ped/Env Group    **■ ■ ■ ■ ■ ■ ■ ■**  
 Access Group     **● ● ● ●**

SUBCOMMITTEE DOCUMENT  
DECEMBER 19, 2008 DRAFT




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Open to ORV and Ped if agreement with landowner (Both Groups)



Reopen interdunal trail on traditional Ramp 72 road bed with crossover to the beach and to the sound (Access Group)

300-ft ORV corridor on points /spits (Access Group)


Both Groups	
Ped/Env Group	
Access Group	

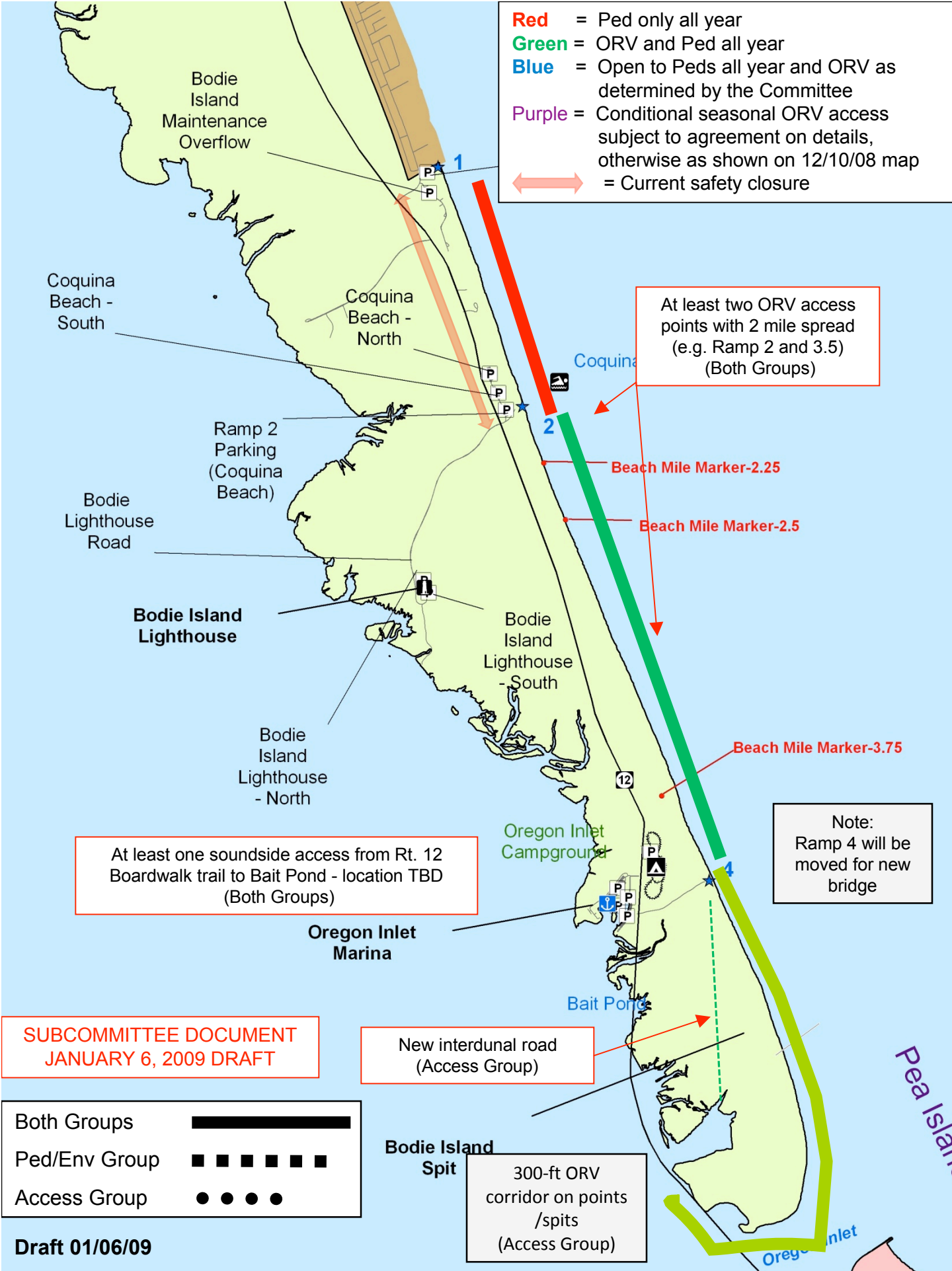
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Note: Ramp 4 will be moved for new bridge

SUBCOMMITTEE DOCUMENT  
JANUARY 6, 2009 DRAFT


New interdunal road (Access Group)

Both Groups   
 Ped/Env Group   
 Access Group 

300-ft ORV corridor on points /spits (Access Group)



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Avon Pier

See narrative for proposed sound side access from south of Avon to Hatteras Inlet (Access Group)


Both Groups	
Ped/Env Group	
Access Group	

New ramp #39 - Location TBD within 100' North of Haul Over Access Road (Both Groups)

Kite Point

SUBCOMMITTEE DOCUMENT  
JANUARY 6, 2009 DRAFT

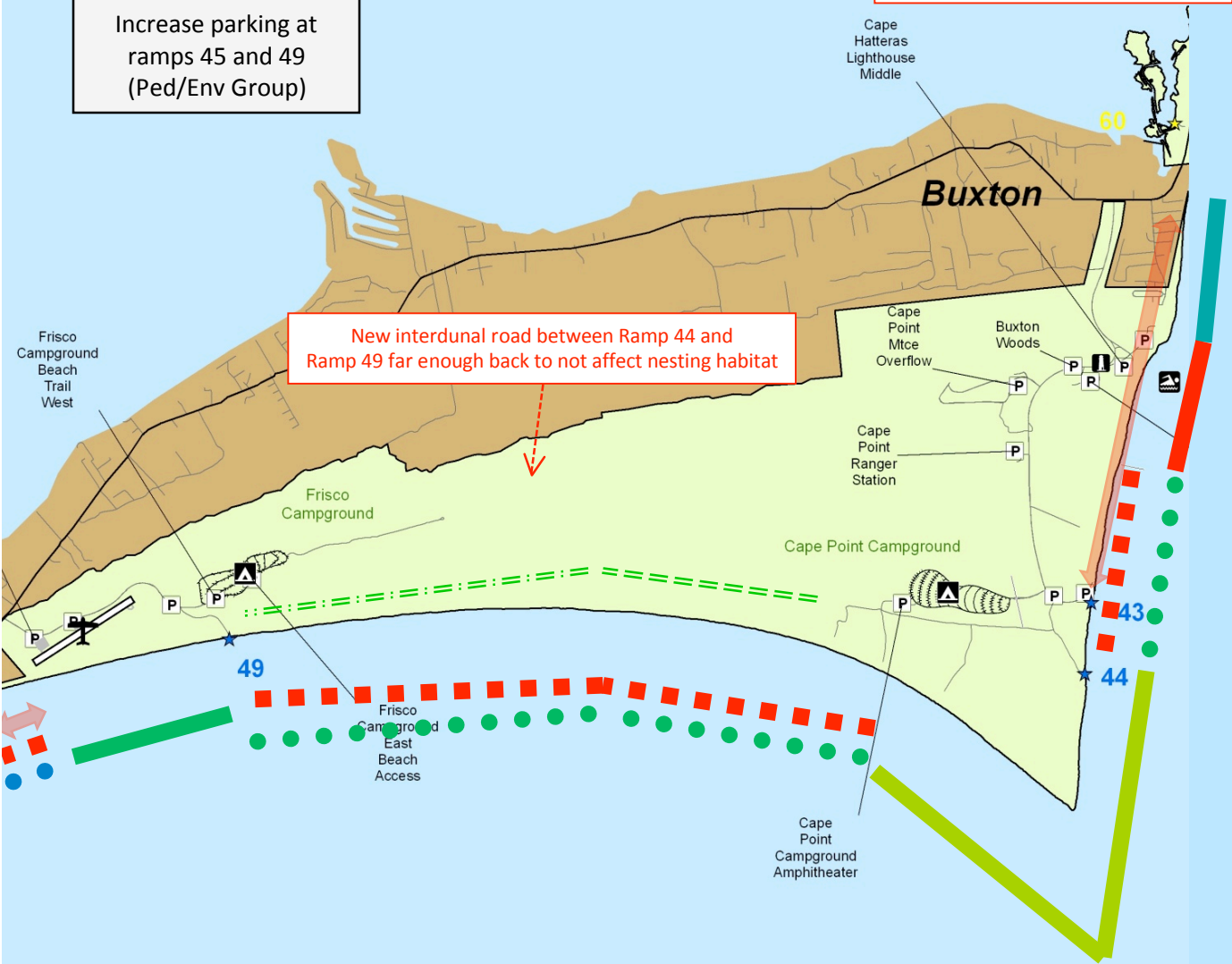
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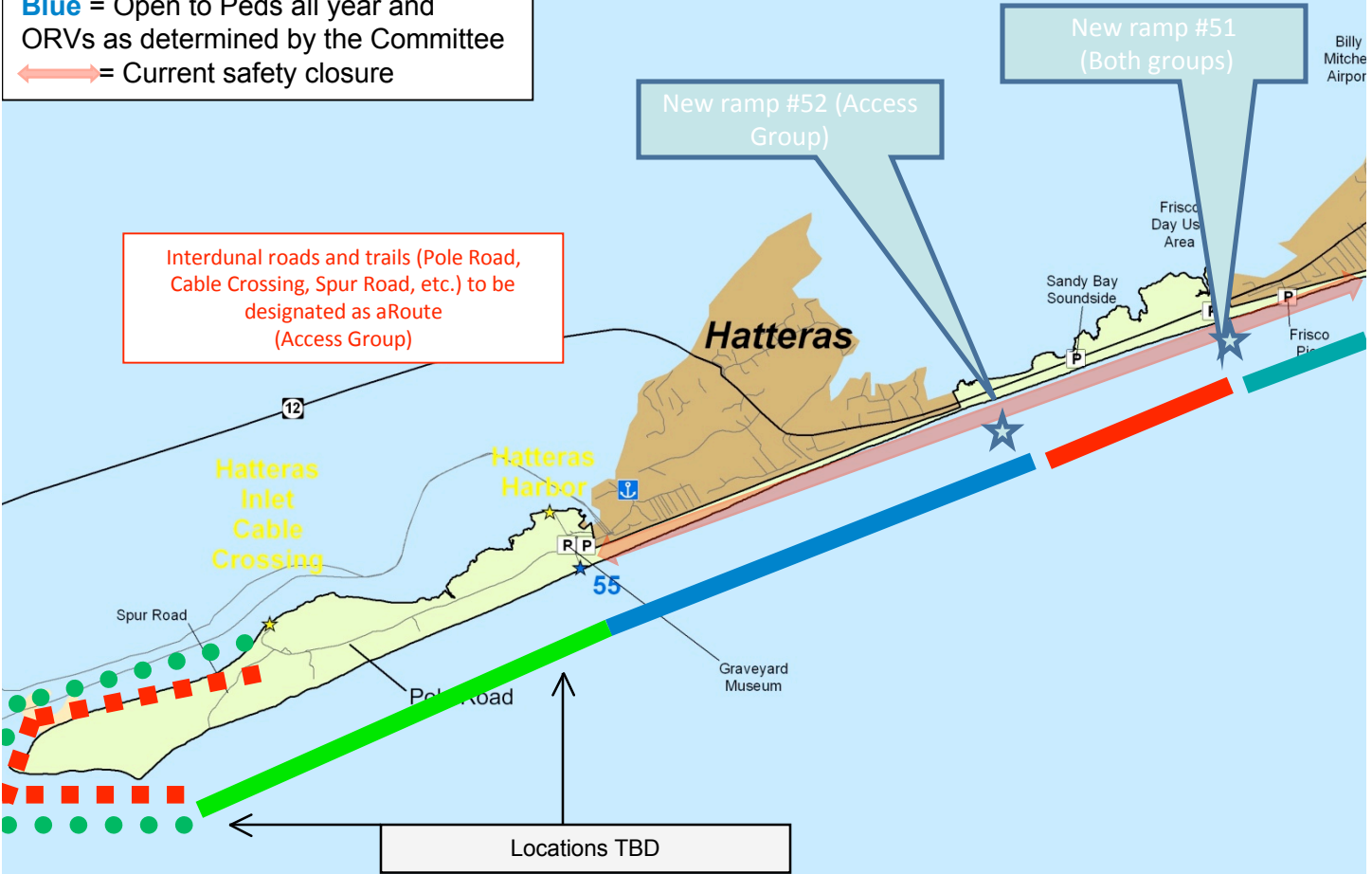


Both Groups   
 Ped/Env Group   
 Access Group 

300-ft ORV corridor on points /spits (Access Group)




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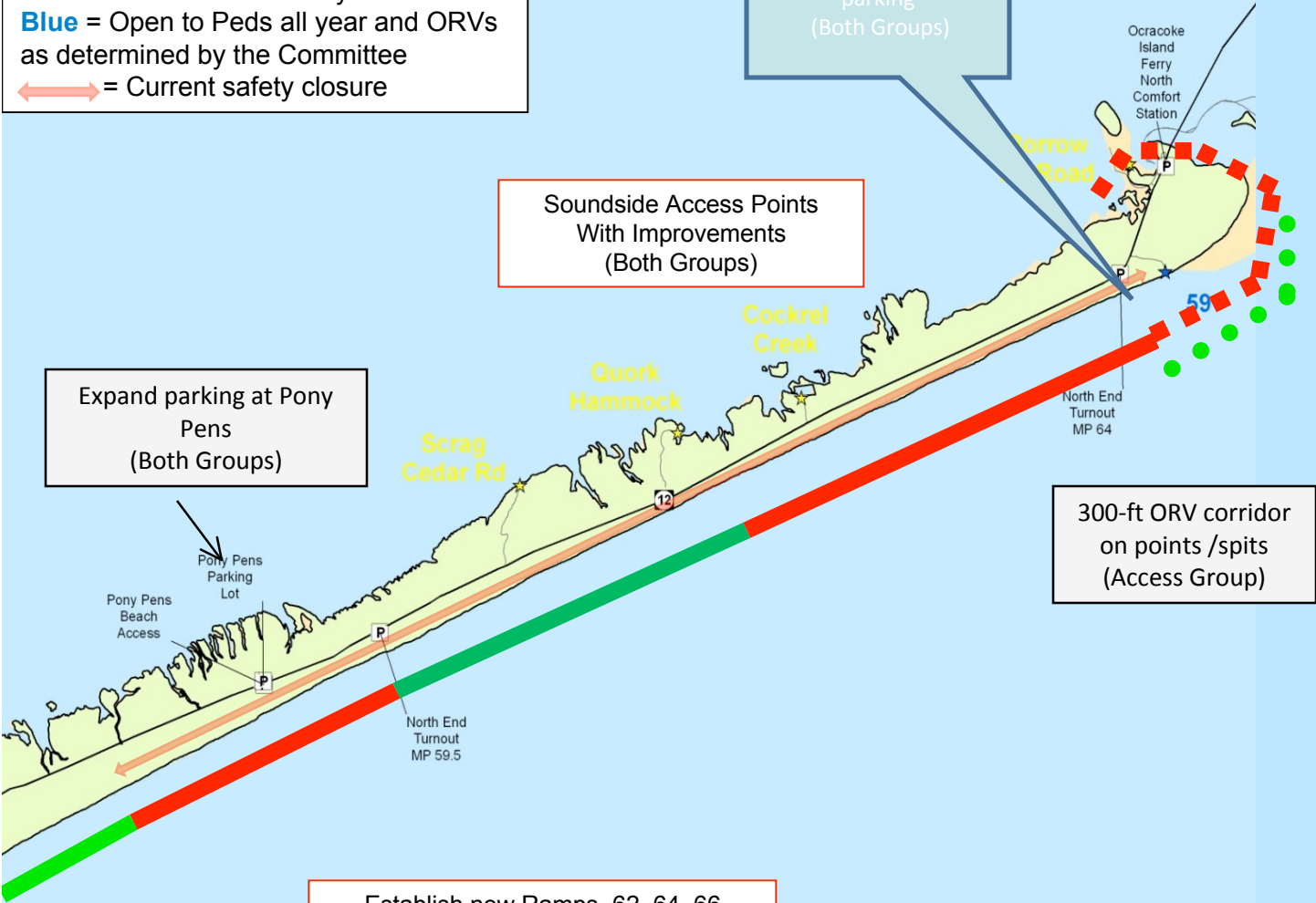
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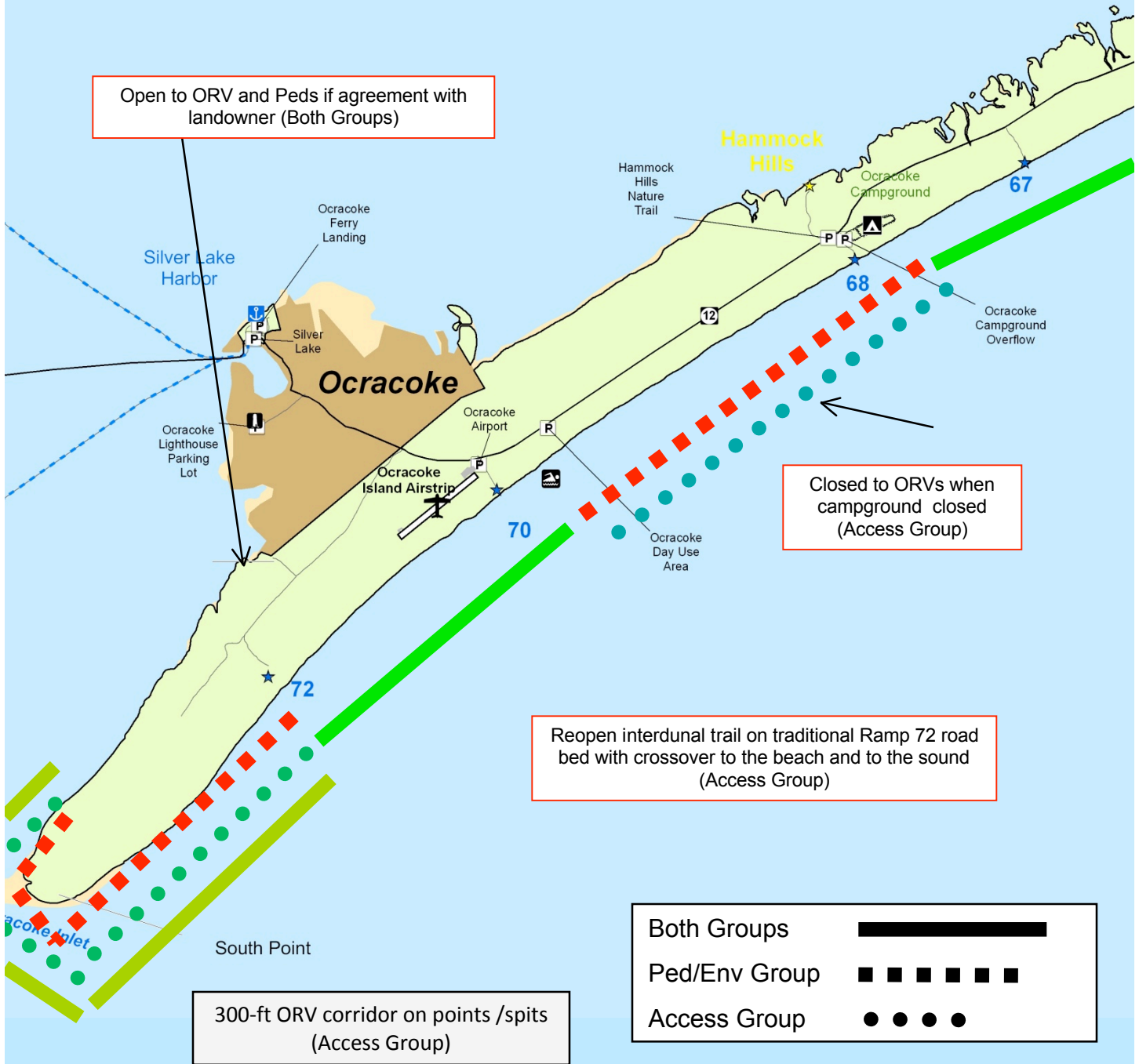


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## United States Department of the Interior



NATIONAL PARK SERVICE  
 Fort Raleigh National Historical Site Wright Brothers National Memorial  
 Cape Hatteras National Seashore  
 1401 National Park Drive  
 Manteo, NC 27954  
 252-473-2111

IN REPLY REFER TO:

A16

January 6, 2009

Memorandum

To: Cape Hatteras National Seashore Regulatory Negotiation (RegNeg) Committee

From: Michael B. Murray, Superintendent and Designated Federal Officer (DFO)

Subject: Clarification of Purpose and Scope of Advisory Committee

The Committee charter signed by Secretary of the Interior Dirk Kempthorne on November 26, 2007 provides guidance on the role and scope of the Committee. See attached document with relevant sections highlighted in YELLOW. Particularly see the following sections: B. Purpose and Function; and C. Objectives and Scope of this Activity.

It is clear that the focus of the Committee is to provide NPS with specific advice on ORV management, rather than on protected species management, though the charter recognizes the interplay between ORV management and protected species management issues. The statement in the last paragraph of Section C that "NPS does not intend to establish a collaborative NEPA process..." means, in part, that NPS is not asking the Committee as a whole to provide technical advice or to negotiate a spectrum of resource management measures applicable to protected species. Section C concludes by stating "the primary focus of the Committee's work will be developing a consensus recommendation on the proposed special regulations."

As a practical matter, considering the amount of Committee meeting and work time remaining, I request that the Committee focus its attention and efforts on developing specific recommendations or consensus advice on the following topics and issues:

- Criteria for, and designation of, ORV routes/areas and non-ORV areas
- ORV corridor width during respective seasons of the year
- Hours and dates of allowable ORV operation on the beach
- Vehicle characteristics, equipment, and operating requirements
- Safety procedures and requirements related to ORV use
- Desirable locations for ORV ramps, interdunal roads, parking lots, or other access-related infrastructure

- Whether or not to allow and when to allow ORV use on village beaches, and how to manage ORV use if it is allowed at certain times
- ORV permit/pass requirements and related education program
- Site specific management of the spits, Cape Point and South Beach
- Management of commercial fishing vehicles on the beach
- Concepts for conducting periodic review

Other matters related to protected species management, such as parkwide standards for monitoring or buffer distances, are outside the scope of advice that NPS is requesting from the Committee. The NPS also believes that an implementable range of options for carrying capacity is as defined as possible at this point in the NPS alternatives; it would be difficult in the time remaining for the Committee to develop a different and mutually agreeable approach; and the topics listed above more urgently need the Committee's attention.

In closing, I appreciate your continued interest in the ORV management issue at Cape Hatteras National Seashore and your ongoing participation in the negotiated rulemaking process.

Sincerely,



Michael B. Murray  
Superintendent

Attachment

cc:

Patrick Field, Consensus Building Institute  
Robert Fisher, Consensus Building Institute



**Charter**  
**2007**  
***Negotiated Rulemaking Advisory Committee for Off-Road Vehicle Management  
at Cape Hatteras National Seashore***

A. DESIGNATION.

The official designation of the committee is the Negotiated Rulemaking Advisory Committee for Off-Road Vehicle Management at Cape Hatteras National Seashore.

B. PURPOSE AND FUNCTION.

The Committee's function is to assist directly in the development of special regulations for management of off-road vehicles (ORVs) at Cape Hatteras National Seashore (Seashore). Executive Order 11644, as amended by Executive Order 11989, requires certain Federal agencies to publish regulations that provide for administrative designation of the specific areas and trails on which ORV use may be permitted. In response, the National Park Service (NPS) published a general regulation at 36 CFR § 4.10, which provides that each park that designates routes and areas for ORV use must do so by promulgating a special regulation specific to that park. It also provides that the designation of routes and areas shall comply with Executive Order 11644, and 36 CFR § 1.5 regarding closures. Members of the Committee will negotiate to reach consensus on concepts and language to be used as the basis for a proposed special regulation, to be published by the NPS in the *Federal Register*, governing ORV use at the Seashore. The duties of the Committee are solely advisory.

C. OBJECTIVES AND SCOPE OF THIS ACTIVITY.

The Committee will serve as an integral part in the NPS development of a proposed special regulation for ORV management at the Seashore. With the participation of knowledgeable affected parties, the NPS expects to develop a practical approach to addressing ORV management and visitor experience issues related to 1) access to beach areas for fishing and other recreational activities; 2) provision of a variety of visitor experiences on the beach, including both ORV and non-ORV experiences; 3) public safety; and 4) protection of beach environments and their associated plant and wildlife communities.

Within the constraints of NPS statutory and policy responsibilities to conserve natural and cultural resources and values and to provide for their enjoyment in a manner that will leave them unimpaired for the enjoyment of future generations, the Committee will evaluate and address key issues possibly including, but not limited to 1) the designation of specific ORV routes and areas, 2) the periods of the year and times of day during which ORVs may be operated on those routes and areas, 3) other conditions that govern the operation of ORVs

at the Seashore, and 4) other management options for accessing the beach (e.g., walkovers and shuttles). Special ORV regulations for the Seashore would identify criteria used to designate appropriate ORV use areas and routes and would establish consistent ORV management practices and procedures that include the ability to adjust ORV management in response to changes in the Seashore's dynamic physical and biological environment.

The Committee may also provide input, though not necessarily a consensus recommendation, on aspects of protected species management that may affect or be affected by ORV management and that are within the scope of the draft ORV Management Plan/Environmental Impact Statement being prepared concurrently with the proposed special regulations or that directly relate to the implementation of the Seashore's 2007 Interim Protected Species Management Plan. The NPS does not intend to establish a collaborative National Environmental Policy Act (NEPA) process, but rather to encourage information flow between the two processes at appropriate points. The primary focus of the Committee's work will be developing a consensus recommendation on the proposed special regulations.

#### D. MEMBERSHIP.

1. To achieve balanced membership among diverse national, regional, and local interests, membership of the Committee will consist of 30 representatives. Members will be appointed by the Secretary of the Interior (Secretary), and will represent the following interests:
  - a. User groups that have an active and ongoing interest in the management of the Seashore (such as ORV, open access, birding and recreational fishing groups, and other user groups);
  - b. Civic and homeowner associations;
  - c. Commercial fishermen;
  - d. Environmental and natural resource conservation groups;
  - e. Tourism, Visitation, and Business organizations; and
  - f. Federal, State, and county governments.
2. In addition to the principal representatives, alternate representatives will be appointed where possible to 1) ensure adequate representation when principal representatives are unable to attend, and 2) allow for broader participation. If a principal representative and alternate represent different organizations, then they shall be expected to represent the interests of both organizations in their Committee participation.

3. Principals and alternates are appointed for the duration of the negotiation. Any member vacancy on the Committee will be filled by the alternate for that member. If both alternate and principal representative cannot serve, the NPS will endeavor to find a replacement representative to maintain the overall balance of the Committee.
4. Members of the Committee will serve without compensation. However, while away from their homes or regular places of business, members attending Committee meetings approved by the Designated Federal Official (DFO) (see F.2 below) may be allowed reimbursement for actual travel expenses, not to exceed those permitted by the General Services Administration's rules for Federal travelers, in the same manner as persons employed intermittently in government service under section 5703 of title 5 of the United States Code (5 U.S.C § 5703).
5. Poor attendance, lack of participation, not participating in good faith, or other significant violations of the ground rules adopted by the Committee are grounds for a decision by DFO to recommend to the Secretary that a member be removed from the Committee.

E. ETHICS RESPONSIBILITIES OF MEMBERS.

No Committee or subcommittee member shall participate in any specific party matter including a lease, license, permit, contract, claim, agreement, or related litigation with the Department of the Interior in which the member has a direct financial interest.

F. ADMINISTRATION.

1. CHARTER.

The Committee is subject to the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C. Appendix 2, and shall take no action unless the charter filing requirements of Sections 9 and 14(b) of FACA have been complied with. The Committee is subject to biennial review and will terminate in accordance with Section G below, unless, before that time, the charter is renewed in accordance with Section 14 of FACA.

2. DESIGNATED FEDERAL OFFICIAL.

The Committee reports to the Superintendent of the Seashore, Manteo, North Carolina. The Superintendent, or in the Superintendent's absence, the Seashore's Chief of Resource Management, will serve as the DFO for purposes of Section 10 of FACA to oversee the management of the Committee. The DFO will be present at all meetings and is authorized to adjourn any meeting whenever he or she determines it to be in the public interest to do so.



3. SUPPORT AND COSTS.

Support for the Committee is provided by the NPS, which may pay for the rental of meeting space, necessary materials and supplies for the meetings, and the services of recording the content of those meetings. The estimated annual operating cost of the Committee, depending on the number of meetings held, is \$220,000.

4. CHAIRPERSON. The DFO will serve as Chair of the Committee.

5. TECHNICAL ADVISORS.

The Chair may accept technical assistance from representatives of other organizations. Areas in which technical assistance may be requested could include beach driving etiquette and outreach, pedestrian access, handicapped access, safety, and protected species. Technical advisors have no authority to make decisions on behalf of the Committee, nor can they report directly to the NPS.

6. WORK GROUPS/SUBCOMMITTEES.

The Committee, in consultation with the DFO, is authorized to form work groups or subcommittees for any purpose consistent with this charter, including issues such as communications and outreach, vehicle equipment and operations, bypasses and alternate routes, or criteria for designating routes and trails. Such work groups shall report back to the full Committee. They have no authority to make decisions on behalf of the full Committee, and they do not report directly to the NPS.

7. MEETINGS AND ANTICIPATED SCHEDULE.

The Committee is expected to meet approximately eight times during its term with a similar number of additional subcommittee meetings, but fewer or more meetings may be held, if necessary. When the schedule is further defined, it will be closely coordinated with the schedule of the concurrent NEPA process.

All meetings will be held at the call of the Chair, after consultation with the Committee. Committee meetings will be called, announced by publication in the *Federal Register*, and held in accordance with the requirements of FACA. Among other provisions, FACA requires open meetings and an opportunity for interested persons to file comments before and after meetings, and make statements during the meeting, to the extent that time permits.

F. DURATION AND DATE OF TERMINATION.

The Committee will terminate on the date the ORV management regulation is published in the *Federal Register*, or 2 years (24 months) after the Committee is established, whichever comes first, unless its charter is renewed in accordance with Section 14 of FACA (see F.1 above) or the Committee is terminated.

G. AUTHORITY.

The Negotiated Rulemaking Advisory Committee for Off-Road Vehicle Management at Cape Hatteras National Seashore is established under the authority of 16 U.S.C. § 1a-2(c), and in accordance with the Negotiated Rulemaking Act, 5 U.S.C. § 561-570. The establishment of this Committee is in the public interest and supports the NPS in performing its duties and responsibilities under the NPS Organic Act, 16 U.S.C. § 1 *et seq.*; Executive Order 11644, as amended; 36 CFR § 4.10; the Endangered Species Act, 16 U.S.C. § 1531 *et seq.*; the enabling legislation for the Seashore, 16 U.S.C. § 459 *et seq.*; and other legal authorities.

Dirk Kempthorne  
Secretary of the Interior

November 26, 2007  
Date Signed

DATE CHARTER FILED \_\_\_\_\_

The filing date of this first charter constitutes the date of establishment of the Negotiated Rulemaking Advisory Committee for Off-Road Vehicle Management at Cape Hatteras National Seashore.

## **6 January 2009 - REVIEW OF CAHA REG NEG REMAINING WORK**

### **Committee Topics Still Open**

- Permits – need to write up most recent proposal
- Natural Resources –
  - Vegetation mgt on Cape Point
  - Turtles
  - Night driving
  - Winter closures
  - Resource tables (not nec)
  - Breeding closure date change - just need to review updated summary
- Village Closures – all open
- Periodic Review -
- Routes and Areas -

### **Committee Topics Basically Resolved**

- Vehicle Characteristics – need to send out
- ORV Safety Closures and Pedestrian Safety – need to send out
-



# **Groundrules for the Public**

## **at CAHA Negotiated Rulemaking Meetings**

To ensure a productive meeting and enable the RegNeg Committee to do its work, we request that the public follow these groundrules. There are three public comment periods set aside on the agenda. Please focus your comments on the topics listed on the agenda.

- ✓ **Please hold your comments for the public comment periods**
- ✓ **Be creative and propose solutions**
- ✓ **Express your own views**
- ✓ **Encourage civility and respect for all**
  - ◆ **Focus on the problem, not the people**
  - ◆ **Disagree, without being disagreeable**
  - ◆ **Refrain from personal attacks**
  - ◆ **Refrain from expressing approval or disapproval of other comments**

Written comment for the Committee may be sent to:  
Designated Federal Official, 1401 National Park Drive,  
Manteo, NC 27954; or [CAHA\\_Superintendent@nps.gov](mailto:CAHA_Superintendent@nps.gov)

## Addressing the NEGOTIATED RULEMAKING COMMITTEE January '09

My name is Douglas A. Taylor and am a resident of Turnersville, NJ 08012. In advance I apologize if it sounds like I am rambling, but what is happening here I have already seen in NJ.

Back in the early 70's a section of Long Beach Island, called Holgate, was fought for by the New Jersey Beach Buggy Association to preserve it in its natural state and keep it from being developed. At that time we had to have it included as a wildlife area to be included in the John Forsyth Bird Sanctuary even though the US Government or USFW did not want it as they considered it too small of an area. Under the terms of the agreement, fishermen, birders, commercial fishermen and any other group was to have free and open access year round to the front beach area via foot, boat and OVI. During the mid 90's a movement was made to limit this access due to the Piping Plover. Nesting area (April 15th to October); first to it was only the tip of the island and we were to have access even just by foot. (The complete walking distance is ~2.5 miles to the tip and the width of the beach is two vehicle widths at most points and narrower at other points). Over a period of two years, drafts like you are proposing along with hearings and a nicely printed book were presented at each point and with alternatives for access plans which also included a "Possible Water Taxi" to be used to by pass "sensitive" areas to go to the "open" areas. To make a long story short, it seems that the USFW had their own plan already finalized and rammed it down our throats that closed access to this section that was originally not wanted to everybody in the name of Preservation of the Plover. It should be noted that the breeding population nor the number of fledglings have not significantly increased over when this same stretch of land had open and unobstructed access. The only thing from the old times was the old perimeter of 20 meters radius was observed for the birds. What I am asking of both the USFW and NPS "What guarantee do we have that the same thing will not happen to the Cape Hatteras Recreational National Park?" and how can we hold you to this promise.

Addressing another area concerning the radius of safety for the Piping Plover, I would like to know how the distance of 600ft radius was arrived at when through studies performed under the blessing of the USFW and published in their study, "*Piping Plover, Atlantic Coast Population*", this was considered the distance that a chick could possibly move from its nest over a period up to five days. Keeping a constant 600 ft radius around each nesting leads me to believe that the location of the chick is not known which causes a closing of a larger beach area to the public than is necessary. (<http://www.fws.gov/northeast/pipingplover/recguide.html>). From the daily reports that I have read from this past year, daily observations were made to track the location of the chicks. If this is true than pedestrian access should be more liberal allowing the use of areas that were closed this past year. This would also allow the pedestrians to wade in the water to by-pass the closed areas.

Presently, available data indicate that a 50 meter buffer distance around nests or chicks will be adequate to prevent harassment of the majority of incubating piping plovers and of the chicks by pedestrians.

<http://www.fws.gov/northeast/pipingplover/recplan/appendixg.html>

In this day and age we have to set the rules by active means and not by passive elimination methods. We have to take active stewardship of our lands which will allow for better use of the beaches. Allow at least pedestrian access along the waters' edge in the closed areas.

As an added comment concerning the use of vehicles in the areas identified as Closed to OVI, it would be a good idea if the vehicle is not a NPS vehicle, but a civilian vehicle, that said vehicle should be easily identified through the use of a magnetic sign. Said sign should measure at least 3 foot x 3 foot and labeled "**National Park Service Special**



**Permit # XXX**” with lettering to be at least 1 foot in height. The signs would be mounted to both the drivers and passenger side doors. These signs would be publicly registered and posted within 12 hours on the Hatteras web site designating the sign number, who it was signed out to, group designation, and reason for being in the designated area.

Since I can not physically be at the meeting I will anxiously watch the tapes for the answers along with a written responses to each question as presented.

Thank you for your time.

Respectfully, Douglas A. Taylor (fishtrek@comcast.net)

----- Forwarded by Mike Murray/CAHA/NPS on 01/08/2009 12:47 PM -----

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01/08/2009 10:34 AM

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cc  
Subject: FW: Waterbirds, vol 31(3) September 2008: Winter Ecology of Piping Plovers at Oregon Inlet, North Carolina, pp472-479

Greetings. Article file attached. PD

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Subject: Waterbirds, vol 31(3) September 2008: Winter Ecology of Piping Plovers at Oregon Inlet, North Carolina, pp472-479  
Date: Thu, 8 Jan 2009 10:28:46 -0500

Greetings, Mr. Murray.

Thank you for my "four minutes" yesterday at the NegReg committee meeting. As promised, attached is the Virginia Tech article written by the lab of Dr. Jim Fraser. Waterbirds is the international, peer-reviewed journal of waterbird biology. The Oregon Inlet project was funded by the US Army Corps of Engineers and was originally intended to include PIPL use of Hatteras Inlet and Ocracoke Inlet. I trust that the article will be posted among the Committee's materials for each member to read.

Over the next few days I will attempt to write down and forward other germane points about my winter at Oregon Inlet which time yesterday did not allow. I would like to emphasize that I came to the meeting on my initiative alone and not at the request or urging of any individual, institution or group.

Populations of many waterbirds are declining around the world. Along the Atlantic coast of the US, CAHA Nat'l Seashore is a critical link in the annual cycle of declining, threatened and endangered species each day of each year. I urge you to manage the Seashore in a comprehensive manner which at all times conserves these fragile resources now and in the future. I further urge the NPS to fund research such as took place at Oregon Inlet during 2005-06 winter in order to understand better the critical importance of the Seashore.

Breeding season research is logistically simple and the dynamics are largely understood for many species. The importance of wintering grounds, staging areas, stop-over sites and migratory corridors is acknowledged, but research is difficult and sparse, at least before electronic tagging. Absent good research management outside of the breeding season is difficult, but still critical. [I would assert that absent good research, prudent management should be more protective or conservative lest errors critical to declining or imperiled resources be made.]

Kindly advise if you have any questions or concerns that I might address. I have copied Jim Fraser and suspect that I can say that he also would be interested in answering any questions which you or your staff may have about the Oregon Inlet study or other issues.

Best regards, Peter

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PIPLOregonInNCarticle.pdf

## Winter Ecology of Piping Plovers at Oregon Inlet, North Carolina

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**Abstract.**—Humans may modify winter habitat of the imperiled Piping Plover (*Charadrius melodus*), yet published accounts of the species' winter ecology are rare. We studied Piping Plovers at Oregon Inlet, North Carolina from December 2005 to March 2006. Plovers used a 20.1 km<sup>2</sup> area (100% minimum convex polygon home range) containing narrow barrier islands with ocean and sound-side beaches, and small shoals, dredged-material islands, and marsh islands in shallow-water sounds. Plover activity was concentrated in twelve areas totaling 2.2 km<sup>2</sup> (95% fixed kernel home range). When plovers were on ocean beaches, they spent less time foraging (18%) than when on Sound Island beaches (88%) and islands (83%,  $P = 0.003$ ). Sound island use increased and beach use decreased as the tide dropped (Logistic regression,  $P < 0.001$ ). Plover use of dredged-material islands implied that habitat managers can create or restore attractive foraging sites where habitat may be declining or limiting. Wintering habitat management should aim to provide foraging opportunities during most of the day and across a range of tide conditions and ensure that foraging habitat is close to roost sites. *Received 19 July 2007, Accepted 20 January 2008.*

**Key words.**—activity budget, behavior, *Charadrius melodus*, habitat, North Carolina, radio telemetry, Piping Plover, restoration, shorebirds, winter.

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Factors that affect distribution, abundance and survival of the federally-threatened Piping Plover (*Charadrius melodus*) on the wintering grounds are poorly understood. Protecting non-breeding plovers and their habitat is a priority in the recovery plans for all three North American breeding populations (USFWS 1988, 1996, 2003), which mix on the wintering grounds (Haig *et al.* 2005). Much research has focused on breeding plovers (reviewed in Haig and Elliot-Smith 2004). Dinsmore *et al.* (1998) documented a small population of overwintering Piping Plovers in North Carolina's Outer Banks, but there have been no other studies of winter populations on the Atlantic Coast in 16 years (Nicholls and Baldassarre 1990), during which the Atlantic Coast breeding population more than doubled (USFWS 2004). The Atlantic Coast breeding population decreased slightly, however, from 2002-2005 (USFWS 2004, preliminary unpublished data). Similarly, the Great Plains population declined from 1996-2001 (Haig *et al.* 2005). Information on habitat and survival in winter might help explain these declines and help improve recovery strategies for this species.

Wintering plovers on the Atlantic Coast prefer wide beaches in the vicinity of inlets (Nicholls and Baldassarre 1990; Wilkinson and Spinks 1994). At inlets, foraging plovers are associated with moist substrate features such as intertidal flats, algal flats, and ephemeral pools (Nicholls and Baldassarre 1990; Wilkinson and Spinks 1994; Dinsmore *et al.* 1998). Because tide and weather variation often cause plovers to move among habitat patches, a complex of patches may be important to local wintering populations (Johnson and Baldassarre 1988; Drake *et al.* 2001). Given the affinity of plovers for inlet-associated habitats, artificial closure of storm-created inlets for protection of human property could reduce local plover carrying capacity. Furthermore, inlet stabilization with rock jetties and channel dredging for navigation alter the dynamics of sediment transport and affect the location and movement rate of barrier islands (Camfield and Holmes 1995), which might in turn affect the availability of plover habitat. Coastal engineers, however, sometimes deposit dredged sediment in low wave-energy bays or sounds behind barrier islands (USACE

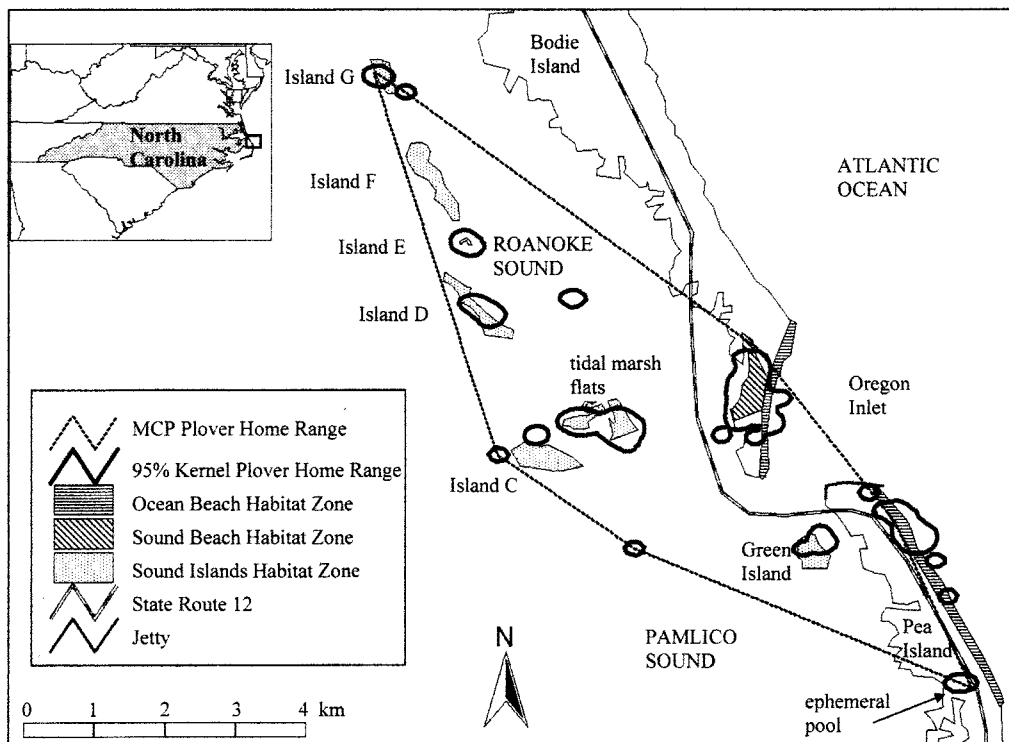
2006), creating small islands with the potential to attract Piping Plovers (Federal Register 2001).

We studied Piping Plover habitat use and behavior in winter in a human-modified inlet system. There has been little data on the use of different habitat zones in the winter that can be used in habitat conservation planning. Portions of our study area were designated as critical habitat for wintering Piping Plovers (Federal Register 2001) until 2004, when a court decision vacated the designation of this unit and three others in Dare and Hyde Counties, North Carolina (U.S. District Court, District of Columbia Civil Action no. 03-216: Cape Hatteras Access Preservation Alliance vs. U.S. Dept. of the Interior, 344 F. Supp. 2d 108, 2004). The designation was remanded to the U.S. Fish and Wildlife Service (USFWS), which is currently reconsidering it (Federal Register 2006). Data

from our study will aid in understanding spatial and temporal patterns of habitat use, and habitat preferences. The results can be used to plan critical habitat protection under the Endangered Species Act, and to provide guidelines for habitat management and creation under programs such as the U.S. Army Corps of Engineers' (USACE) "Beneficial Uses of Dredge Materials" (USACE 2006).

#### STUDY AREA

Plovers at Oregon Inlet (N 35°46.5'W, 75°32.1'), Dare County, in the Outer Banks barrier island chain of North Carolina (Fig. 1) were studied from 5 December 2005 to 23 March 2006, at the northern edge of the species' wintering range (Haig and Elliott-Smith 2004). Monthly mean temperature during the study was 9.2°C. The minimum temperature dropped below freezing in 10 d, approximately 9.4 d less than normal (NOAA 2006a). Total precipitation was 32.8 cm, 35% below normal (NOAA 2006a). Oregon Inlet Channel, a USACE-maintained navigation channel, passed through Oregon Inlet from the Atlantic Ocean in the east to Pamlico



**Figure 1.** Map of study area for Piping Plover winter ecology research, Oregon Inlet, North Carolina, 2005-2006. Pea Island is the northern tip of Hatteras Island. Piping Plover minimum convex polygon (MCP) and 95% fixed kernel home ranges and the extent of the habitat zones (ocean beach, sound beach, sound islands) recognized in this study are depicted.

Sound (average depth 4.6 m, Paerl *et al.* 2001) and Roanoke Sound (typical depth on nautical charts approximately 0.6 m) in the west. Bodie Island Spit, part of Cape Hatteras National Seashore (CAHA), was a 2-km long peninsula that bounded Oregon Inlet to the north, and ranged from 500-750 m wide. The ocean side of the spit consisted of a sandy beach approximately 150 m wide that was frequented by recreational fisherman in off-road vehicles (ORVs). The Roanoke Sound side of the spit consisted of grassy dunes interspersed with storm-fed ephemeral pools and a 20-ha sand flat, approximately two ha of which was intertidal and the rest of which was algae-covered and overwashed only during extreme high tides. Pea Island National Wildlife Refuge (NWR) on Hatteras Island bounded Oregon Inlet to the south, and was approximately 500 m wide in the study area. The ocean side of the island consisted of a sandy beach approximately 150 m wide and was accessible only by pedestrian traffic. The beach was backed by a grassy dune ridge, behind which Highway 12 ran through the barrier flats. The Pamlico Sound side of the island consisted of salt marsh. The small islands within Pamlico and Roanoke Sounds included Green Island (a flood shoal owned by CAHA) and dredged-material islands C, D, E, F, and G created by the USACE (Fig. 1). Except for Island E, which last received dredged material in 1977 and was wholly intertidal, the Corps deposited dredged material on these islands at least through the mid-1990's (U.S. Army Corps of Engineers, Wilmington District, unpublished data). Dredged-material islands had open or vegetated sand, salt marshes, tidal creeks, and tidal flats. Plovers also used several unnamed tidal marsh flats and mudflat/sandflat islands. The intertidal portions of these named and unnamed islands ranged from <1 ha to 9.6 ha. Due to the shallowness and size of the sounds, tide heights and thus the exposure of sound-side intertidal areas were much affected by wind direction and speed (Pilkey *et al.* 1998). Most tidal flat exposure occurred during strong easterly winds.

## METHODS

### Field Methods

All accessible Piping Plover habitat were surveyed daily by boat, auto, or foot, scanning by spotting scope and recording the number of Piping Plovers and any band combinations seen. These scans were used to estimate the size of the population, where the winter population was considered to be the set of individuals that used Oregon Inlet from December to March. Capture of plovers was attempted from 4 December 2005 to 8 March 2006 using a combination of noose carpets (Drake *et al.* 2003) and bungee-propelled whoosh nets (SpiderTech, Helsinki, Finland), under federal and state threatened and endangered species and banding permits, and National Park Service and National Wildlife Refuge research permits. All captured birds were uniquely marked with a color band on each tibiotarsus. A 1.4 g radio transmitter (Model BD-2, Holohil Systems Ltd., Ontario, Canada) was attached to the back between the scapulae using cyanoacrylate glue (DURO Quick Gel® Henkel Consumer Adhesives, Inc., Avon, OH). Seven individuals were captured, color-marked, and radio-tagged between 5 December-10 February. Mean radio retention was  $17 \pm 7$  d (range 3-57 d). During the daily surveys, radio-marked birds were tracked

with three-element handheld Yagi antennae and an ATS receiver (ATS, Isanti, MN). Attempts were made to locate each marked bird daily between dawn and dusk, and where time allowed twice/d during two different tidal stages. An average of 7.5 h/d (range 1.25-11.33 h/d) was spent surveying the plover population and searching for radio-tagged birds. Short survey days resulted from inclement weather or the need to spend time trapping. The surveys typically began in the morning ( $\bar{x}$  = 08.05 h, range 04.00-13.10 h) and ended in mid-afternoon ( $\bar{x}$  = 15.32 h, range 08.23-19.00 h). An average of 90% (SE = 3.8, range 33-100%) of the tagged plovers were relocated each day (N = 52 d where tagged birds were available and tracked).

An attempt was made to sample the behavior of all marked birds each day, and if possible twice/d during different tidal stages. When a marked plover was located it was observed through a spotting scope for five min. Foraging attempts (pecks at the substrate) were counted continuously and behavior (foraging, resting/preening/standing alert, intra-specific aggression, flying, other) every 10 s. Behavior of shorebirds is tide-dependent (Burger *et al.* 1977), so it was ensured that different tidal stages within each cover type were sampled to avoid biasing the results.

To estimate foraging habitat availability, the intertidal zone (ITZ, 5-8 contours over a tidal range of 30-50 horizontal m) was contour-mapped in plover foraging habitat, including barrier island ocean beach, barrier island sound beach, and five of the sound islands that contained 68/94 (72%) of the sound island plover sightings, by walking along the water's edge at various tide heights carrying a GPS unit (GeoXT, Trimble, Miami, FL). The contours were differentially-corrected using base station data and Pathfinder software (Trimble, Miami, Florida), then the area exposed at each tidal stage was calculated in a GIS (ArcGIS 9.1, ESRI, Redlands, CA). Tide tables (NOAA 2005, NOAA 2006c) were used for stations near each of the mapped sites to calculate the predicted tidal height at the time each of the contours was mapped, with the predictions adjusted for the difference between predicted (lunar) height and verified (wind-driven) height available in six-min resolution from the Oregon Inlet Marina NOAA tide station (NOAA 2006b). Simple linear regression was used to model area of ITZ exposed as a function of estimated tide height. The resultant regression equations were used to predict exposed ITZ area in three habitat zones (ocean beach, sound beach, sound islands) at the time of every plover location, considering the sum of the areas at the five sound islands mapped to be an index of ITZ availability for all sound islands.

### Data Analysis

*Home Range.* All radio-tagged Piping Plovers in the Oregon Inlet population were observed in a single flock on 27/38 survey d in which  $\geq 2$  tagged plovers were in the population, indicating that the birds tended to move as a flock. All plover locations were therefore pooled and a home range for the flock calculated, disregarding sightings that were closer than one h apart. If two tagged plovers were in the same group at the same time, one of them was randomly chosen for inclusion in the sample. A 100% minimum convex polygon (MCP) home range and a 95% fixed kernel home range were calculated using HRT: Home Range Tools (Rodgers *et al.* 2005) in ArcGIS 9.1 (ESRI, Redlands, California) af-



ter eliminating duplicate X,Y coordinates. The smoothing factor ( $h$ ) was calculated using Least-Squares Cross Validation (Seaman and Powell 1996) and standardized variances for the X and Y coordinates (Silverman 1986).

**Habitat Use and Availability.** All plover habitats used fell into one of three habitat zones: ocean beach (barrier islands), sound beach (barrier islands), and sound island (dredged material, shoal, and other marsh and mudflat/sandflat islands, Fig. 1). Discrete-choice (multinomial) logistic regression (McFadden 1974) was used to model habitat zone use (the probability of the flock occupying a particular zone) as a function of the index of sound island ITZ exposed. Use was categorized as 1 = ocean beach, 2 = sound beach, 3 = sound islands each time a radio-tagged bird was located. Since this analysis was performed for the flock rather than for individual birds, one tagged bird was randomly chosen for the analysis if two or more birds were observed together, using only observations that were at least one  $h$  apart. To check the validity of pooling the birds, an individual bird effect was tested using a repeated measures logistic regression model, which found that it did not fit better than the model with individuals pooled (AIC<sub>c</sub> for repeated measures model = 380.2, for pooled model = 381.1, where a difference <2 indicates neither model is better than the other, Burnham and Anderson 2002). By using radio-telemetry to locate the flocks, the need to consider detection bias that can affect inferences about presence (Nichols *et al.* 2000) was minimized. The fit of the model was assessed by examining the deviance/degrees of freedom (df) and the Pearson  $\chi^2/df$  (Hosmer and Lemeshow 1989). Values close to 1.0 indicated good fit. If either measure was >1.0, the larger was used as a scale factor for the covariance matrix, to reduce bias in our standard error estimates.

**Behavior.** Foraging rates among the three habitat zones were compared using repeated measures ANOVA with first-order temporal autocorrelation (Proc Mixed, SAS Institute, Cary, NC), where the birds were the subjects. Mean % time in different behaviors for each bird within each habitat zone was calculated. The median of these mean activity budgets was compared among habitat zones using multi-response permutation procedure for blocked data (MRBP) in Blossom (Cade and Richards 2001), where the blocks were individual birds. The MEDQ procedure in Blossom was used to produce the multivariate median coordinate (MMC) of the activity budgets within each habitat zone. The MMC is a measure of location that takes into account the non-independence of the response variables (Cade and Richards 2001), which were % time in behavioral categories in this case. If the overall test of a difference among habitat zones was significant, the MRBP analysis was performed on each pair of habitat zones ( $\alpha = 0.05/3$  habitat zones categories = 0.016). MRBP was then used on each behavioral category separately to determine which ones differed among habitat zones ( $\alpha = 0.05/5$  behavior categories = 0.01).

## RESULTS

### Population Size and Survival

A minimum total population size of eleven birds was estimated in the region of Oregon Inlet. This was the maximum counted in

one flock, was the maximum observed on daily counts from 1 January-23 March, and was the count in 11/82 daily surveys. All marked plovers were known to be alive on 4 March. Three were observed on 23 March, the final survey day.

**Home Range.** The MCP home range size for the population was 20.1 km<sup>2</sup> (Fig. 1). The 95% fixed kernel home range size was 2.2 km<sup>2</sup> (Fig. 1) and included twelve islands and beaches.

**Habitat Use and Availability.** The Pearson  $\chi^2/df$  for the discrete choice logistic model was 1.3, indicating some overdispersion, so  $\sqrt{1.3}$  was used as a scale factor for the covariance matrix. Probability of the flock being present on the sound islands increased and probability of use of sound and ocean beaches decreased with increasing exposure of the intertidal area of the sound islands (Fig. 2). Piping Plovers were more likely to use sound islands than the ocean beach (Wald's  $\chi^2_1 = 12.7, P < 0.001$ ) and the sound beach (Wald's  $\chi^2_1 = 16.7, P < 0.001$ ), as the Sound Islands became exposed, but were equally likely to use the sound and ocean beaches (Wald's  $\chi^2_1 = 1.9, P = 0.164$ ). In the early stages of the falling tide, the sound and ocean beach ITZ emerged while the sound island ITZ remained mostly submerged; as the tide dropped further the sound island ITZ emerged rapidly (Fig. 3).

**Behavior.** Mean foraging rate was higher in the sound islands than the ocean beach,

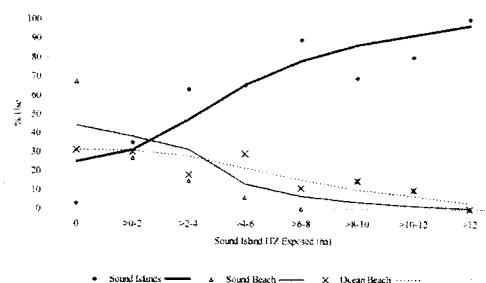


Figure 2. Piping Plover % use (points) and predicted % use from a discrete-choice logistic regression model (lines) of sound islands, sound beach, and ocean beach as a function of estimated area of sound island intertidal zone (ITZ) exposed. Global significance test for model fit: Wald's  $\chi^2_2 = 24.0, P < 0.001, N = 197$  observations of tagged birds.

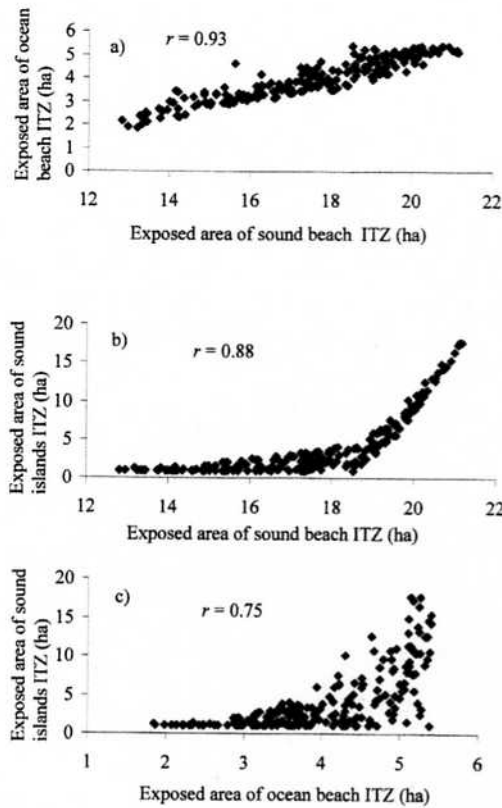


Fig. 3. Correlations ( $r$ ) between predicted exposed area a) sound and ocean beach ITZ, b) sound island and sound beach ITZ, and c) sound island and ocean beach ITZ. Data derived from National Oceanic and Atmospheric Administration tide stations and our tide line contour maps. In the bottom two figures, untransformed data is depicted but the data were log-transformed before correlation calculation, to linearize the relationships.

while foraging rate in the sound beach was similar to that of both of the other habitat zones (Table 1). Plovers spent more time standing (resting/preening/alert) and less time foraging when on ocean beaches than when on the sound beach and the sound islands (Table 2). When on the ocean beach, the flock was more often found on Pea Island south of the inlet (44/46 locations, 96%) than on Bodie Island north of the inlet (2/46 locations, 4%,  $\chi^2_1 = 38.3$ ,  $P < 0.001$ ). The southern roosting area was 1.8 km from the sound beach foraging site and 3.8 km from the most often used sound island, while the northern roosting area was 0.4 km from

the sound beach foraging site and 1.8 km from the most often used sound island.

#### DISCUSSION

Piping Plover habitat use at Oregon Inlet was strongly influenced by tidal stage. When water levels were low, exposing the intertidal areas of the sound islands, plovers preferred sound islands over both the ocean and sound sides of the barrier islands. Piping Plovers in Alabama also preferred sand flat islands at low water levels (Zivojnivich and Baldassarre 1987). Other studies have shown that where wintering shorebird habitat availability depends on the tide, habitat selection is a function of safety at roost sites (Rogers *et al.* 2006), foraging habitat quality (Burger *et al.* 1977; Smith and Nol 2000; van Gils *et al.* 2006), and the distances between roosts and foraging areas (Dias *et al.* 2006; van Gils *et al.* 2006). Although our results are in accord with and extend other findings, replication of our study with more flocks in different parts of the winter range would lend greater support to our inferences.

Wintering birds with small home ranges containing safe roosts and abundant prey should experience low commuting costs, and would be expected to have high survival, as was demonstrated for Piping Plovers wintering in Texas which had 100% survival (mean home range size  $12.6 \pm 3.3$  km<sup>2</sup>, Drake *et al.* 2001). Although the home range of Piping Plovers in our study area was only 1.6 times greater than was observed in Texas, and we likewise observed no mortality, the population size in our study area, as estimated by maximum count, was very small. This was despite the fact that foraging rates in our study area were similar to those observed in Texas (range of means within different cover types 7.0-16.2 attempts/min, Zonick 2000) where population sizes are much larger. The low population size at Oregon Inlet may have been a function of our study area being at the edge of the species' range (Dougall *et al.* 2005; Voisin *et al.* 2005). However, anthropogenic factors such as human disturbance that might diminish carrying capacity (Goss-Custard *et al.* 1996) need to be assessed before



**Table 1. Foraging rates (attempts/min) of Piping Plovers in the vicinity of Oregon Inlet, North Carolina, December 2005-March 2006.**

Habitat Area	N <sup>a</sup>	Least-square			Lower 95% CL	Upper 95% CL
		$\bar{x}$	SE			
Ocean beach	5	8.14 B <sup>b</sup>	1.70	4.29	11.99	
Sound beach	6	12.45 AB	0.95	10.30	14.61	
Sound islands	7	15.57 A	0.66	14.08	17.60	
Roadside pool <sup>c</sup>	1	12.37	—	—	—	

<sup>a</sup>N = number of birds. Foraging rate of each bird was subsampled several times (range = 1-11 for ocean beach, 1-34 for sound beach, 13-36 for sound islands).

<sup>b</sup>Means with the same capital letter are not significantly different (Repeated measures ANOVA,  $F_{2,9} = 10.21$ ,  $P = 0.005$ , pairwise comparisons calculated with Tukey's test on least-squares means).

<sup>c</sup>One marked bird was observed seven times foraging at an ephemeral pool beside Highway 12 within Pea Island NWR. Not included in ANOVA.

conclusions about ecological correlates of population size at Oregon Inlet can be drawn.

Intense human disturbance in shorebird winter habitat can be functionally equivalent to habitat loss if the disturbance prevents birds from using an area (Goss-Custard *et al.* 1996), and can lead to roost abandonment and local population decline (Burton *et al.* 1996). In our study Piping Plovers commonly roosted on the ocean beach south of Oregon Inlet and rarely roosted on the ocean beach north of the inlet, despite the fact that the southern beach was 2.1 and 4.5 times farther than the two most frequently-used foraging sites. The northern beach was used by ORVs while the southern beach had only limited pedestrian traffic. Controlled man-

agement experiments could determine if recreational disturbance drives roost site selection at Oregon Inlet, and if control of disturbance might lead to increased use of the northern beach as a roost area.

The temporal lag in ITZ exposure among sites at Oregon Inlet meant that plovers had foraging opportunities during most of the tidal cycle. Without the sound islands, good foraging habitat might have become scarce at low water levels on some days, because the sound beach ITZ dried out at low tide when the wind was easterly, and dry intertidal zone may not be profitable (Burger *et al.* 1977). The ability of plovers to find food during much of the day can be important for survival of the energetically-demand-

**Table 2. Multivariate median activity budgets of Piping Plovers in the vicinity of Oregon Inlet, North Carolina, December 2005-March 2006.**

Behavior	Median Proportion of Time Spent <sup>a</sup>			STS <sup>b</sup>	P
	Ocean beach	Sound beach	Sound islands		
Foraging	0.11	0.88	0.82	-7.23	<0.001
Resting/Preening/Alert	0.82	0.07	0.10	-7.40	<0.001
Intraspecific aggression	0.01	0.00	0.00	0.94	0.863
Flying	0.01	0.01	0.02	-0.21	0.340
Other	0.03	0.02	0.05	0.76	0.763
All				-5.24 <sup>c</sup>	<0.001

<sup>a</sup>Multivariate median coordinates (MMC) from the MRBP, N = 6 mean activity budgets (one bird was not observed on the sound beach and had to be dropped from MRBP); number of observations from which means were calculated = 158 on sound islands, 74 on sound beach, 64 on ocean beach).

<sup>b</sup>STS = Standardized test statistic (Pearson Type III) of the MRBP analysis.

<sup>c</sup>STS for the overall test of similarity of activity budgets among habitat zones. The MRBP analysis was conducted for each pair of habitat zones ( $\alpha = 0.016$ ). The sound beach and sound islands did not differ (STS = 1.61,  $P = 0.942$ ), and the ocean beach was different than both the sound beach (STS = -2.61,  $P = 0.016$ ) and the sound islands (STS = -3.18,  $P = 0.009$ ).

ing winter period (Pienkowski 1982). Most of the sound islands used by plovers were artificially created by the USACE, suggesting that constructed sand flats can successfully mitigate habitat loss due to other beach and inlet management activities or recreational disturbance, and may be useful in habitat restoration projects in general. Plovers used engineered islands in which the most recent sand deposition ranged from 28 years to < ten years, suggesting that restoration efforts could have short- and long-term benefits. The roost-foraging site distances we observed suggest that foraging habitat created as far as 6.5 km from a roost could benefit Piping Plovers. The USACE's "Beneficial Uses of Dredged Material" program provides one avenue for creation of wildlife habitat using sediment dredged during navigation projects (Yozzo *et al.* 2004; USACE 2006). In addition, recent collaboration between the Corps and the bird conservation community has significantly raised awareness of the importance for the Corps to consider bird habitat needs during coastal engineering projects (Guilfoyle *et al.* 2006, 2007).

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