

Chapter 8

**Comments and
Coordination**

8.0 Comments and Coordination

An Environmental Impact Statement (EIS) that addresses the full range of alternatives and issues important to the selection of a Preferred Alternative can be accomplished only in consultation with those who have a stake in the decision. This chapter summarizes in chronological order the scoping and coordination conducted in preparation of the 1993 Draft Environmental Impact Statement (DEIS), the 2005 Supplemental Draft Environmental Impact Statement (SDEIS), and the 2007 Supplement to the SDEIS (SSDEIS). The chapter then summarizes the public and agency review of both the SDEIS and SSDEIS, and it presents responses to the substantive comments received from both the public and environmental resource and regulatory agencies following the release of these documents.

8.1 1993 Draft Environmental Impact Statement

8.1.1 Citizen and Agency Scoping

Two rounds of scoping were conducted for the 1993 DEIS. In May 1990, upon initiation of a Bonner Bridge replacement feasibility study, a scoping letter was sent to government agencies. The feasibility study was undertaken to examine promising Oregon Inlet crossing replacement alternatives. A Citizens Informational Workshop was held July 19, 1990. Agency input from the scoping letter and public input from the workshop helped to formulate the range of alternatives examined in the feasibility study. The findings of the feasibility study are documented in *Feasibility Study for the Replacement of the Herbert C. Bonner Bridge on NC 12 Over Oregon Inlet* (NCDOT, April 1991).

Citizens Informational Workshops were held on February 19 (in Manteo) and 20 (in Hatteras Village), 1991, during which the alternatives and preliminary feasibility study findings were presented for public review. In May 1991, a second scoping letter—along with a copy of the final feasibility study report—was distributed to state and federal environmental resource and regulatory agencies. On May 29, 1991, a formal scoping meeting was held for local, state, and federal agencies. Input from the 1991 scoping letter, the scoping meeting, and the workshops was used to finalize the alternatives and issues to be considered in the 1993 DEIS.

Issues raised during the initial scoping process related to:

- Alternatives to be addressed in the DEIS;
- Meeting travel demand;
- Providing for emergency evacuation;
- Accommodating bicycles on the bridge;
- Using environmentally sensitive construction methods;
- Ensuring land use compatibility;

- Recreational resources;
- Considering effects on historic properties and archaeological resources;
- Considering coastal conditions;
- Assessing impacts to wildlife and aquatic life;
- Assessing impacts to threatened and endangered species; and
- Minimizing impacts to coastal wetlands.

8.1.2 Agency Coordination

Numerous government agencies and organizations were contacted during the feasibility study and preparation of the 1993 DEIS to gather data and discuss potential impacts. The information they provided was incorporated into:

- Traffic, community, and air quality studies;
- Coastal conditions studies;
- Natural systems studies;
- Archaeological studies; and
- Historic architecture studies.

In addition to the agency coordination conducted as part of the scoping process and data gathering, additional coordination meetings were held with agencies during preparation of the DEIS to discuss permitting and mitigation issues. Meetings were held with:

- US Army Corps of Engineers (USACE), Washington, North Carolina, Regulatory Field Office, July 8, 1991;
- North Carolina Department of Environment and Natural Resources (NCDENR), Division of Coastal Management, Elizabeth City, North Carolina, July 9, 1991;
- USACE, Wilmington, North Carolina, District Office, July 10, 1991;
- Interagency meeting in Manteo, North Carolina, July 11, 1991, with the National Park Service (NPS), the NCDENR Division of Coastal Management, the NCDENR Division of Environmental Management, the US Coast Guard, and the US Fish and Wildlife Service (USFWS);
- USFWS, Raleigh, North Carolina, Field Office, April 14, 1992; and
- North Carolina Department of Transportation (NCDOT) Permit Agency Review Meeting, Raleigh, North Carolina, July 1, 1993, with the NPS, the USACE, the US Coast Guard, the USFWS, and the NCDENR Division of Coastal Management.

In April 1993, the four cooperating agencies (US Coast Guard, USACE, NPS, and USFWS) were asked to examine a review copy of the DEIS. Revisions were made to the DEIS based on their comments.

8.1.3 Public Hearing and Agency Review

After the release of the DEIS in November 1993, combined (corridor and design) Public Hearings were held February 23, 1994 in Nags Head, North Carolina and February 24, 1994 in Buxton, North Carolina. Approximately 35 people attended the first hearing and 21 spoke. Approximately 40 people attended the second hearing and 10 spoke.

Comments on the DEIS were received from both the public and the following federal, state, and local agencies:

- Federal Emergency Management Agency;
- Federal Energy Regulatory Commission;
- USACE, Wilmington District;
- US Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS);
- US Department of the Interior;
- US Environmental Protection Agency (USEPA);
- NC Department of Cultural Resources, State Historic Preservation Office (SHPO);
- NCDENR:
 - Division of Coastal Management
 - Division of Environmental Management
 - Division of Land Resources
 - Division of Marine Fisheries
 - Division of Parks and Recreation
 - Office of Policy Development
 - Washington Regional Office
 - NC Wildlife Resources Commission; and
- County of Dare.

The following non-governmental organizations also submitted comments:

- Carolina Electric Cooperatives;
- Conservation Council of North Carolina;
- Outer Banks Chamber of Commerce; and
- Sierra Club (Legal Defense Fund and North Carolina Chapter).

8.2 Review of Preliminary Final Environmental Impact Statement

A preliminary Final Environmental Impact Statement (FEIS) was prepared in 1996, but never signed and released because formal consultation with the USFWS under Section 7 of the Endangered Species Act was not completed.

Because it had been more than seven years since completion of the DEIS, a re-evaluation was conducted in 2001 to determine if the preliminary FEIS remained a valid assessment of project impacts. Copies of the preliminary FEIS were distributed to the following state and federal environmental resource and regulatory agencies in May 2001:

- USACE, Wilmington District;
- US Coast Guard;
- US Department of Commerce, NOAA, NMFS;
- US Department of the Interior:
 - Fish and Wildlife Service, Pea Island National Wildlife Refuge
 - Fish and Wildlife Service, Raleigh Field Office
 - National Park Service, Outer Banks Group, including the Cape Hatteras National Seashore
- USEPA;
- NC Department of Cultural Resources, SHPO;
- NCDENR:
 - Division of Coastal Management
 - Division of Marine Fisheries
 - Division of Water Quality
 - Wildlife Resource Commission, Habitat Conservation Program, and

- County of Dare.

Issues raised during review of the preliminary FEIS included the need to:

- Update socioeconomic, biological, and environmental data and any resulting changes in impacts;
- Take into account Outer Banks Task Force (OBTF) activities and recent NC 12 vulnerability analysis findings;
- Discuss the current status of the proposed Oregon Inlet jetties;
- Take into account USFWS plans to designate the sand shoal island west of Bonner Bridge as a Wilderness area;
- Reflect increased piping plover nesting and critical habitat designations;
- Evaluate impacts to essential fish habitat;
- Prepare a new map of submerged aquatic vegetation;
- Consider a longer bridge to avoid three vulnerable areas (“hot spots”) between Oregon Inlet and Rodanthe where the overwash of NC 12 during storms has become a regular problem, including reconsideration of the West Bridge Alternative;
- Take into account the National Wildlife Refuge System Improvement Act of 1997 in selecting a replacement bridge location;
- Take into account the NPS’s policies on impairment of undisturbed natural processes; and
- Complete the Section 7 consultation process with the USFWS prior to the release of an FEIS.

On June 27, 2001, a meeting was held with the Federal Highway Administration (FHWA), the NCDOT, and other state and federal environmental resource and regulatory agencies to discuss the project. Discussions focused on:

- Cape Hatteras National Seashore (Seashore) and Pea Island National Wildlife Refuge (Refuge) boundaries and jurisdictions;
- The reappearance of a sand shoal island west of Bonner Bridge considered for designation as a Wilderness area in the early 1970s;
- The National Wildlife Refuge System Improvement Act of 1997 and its effect on the ability of the USFWS to authorize a new permanent easement for a bridge terminus within the Refuge;
- Hatteras Island’s terminal groin and its potential disposition once Bonner Bridge is replaced; and
- Potential new Bonner Bridge replacement alignments and the scope of replacement alternatives given the above items, as well as the presence of three “hot spots” between Oregon Inlet and Rodanthe. Overwash of NC 12 at these spots during storms has become a

regular problem and is under investigation as a part of the OBTF's study of the short-term and long-term protection and maintenance of a transportation system on the Outer Banks.

Based on the reasons listed above, the decision was made in 2001 to prepare a SDEIS.

8.3 SDEIS Scoping and Agency Coordination

Work on the SDEIS began in 2002 with a new study of potential Bonner Bridge replacement alternatives. Scoping for the SDEIS was conducted by reviewing the comments on the preliminary FEIS described in Section 8.2, as well as comments received during meetings of the project's National Environmental Policy Act (NEPA)/Section 404 of the Clean Water Act (NEPA/Section 404) Merger Team.

8.3.1 NEPA/Section 404 Merger Team Meetings

The NEPA/Section 404 merger process was developed under an agreement between the NCDOT, the FHWA, the USACE and other state and federal environmental resource and regulatory agencies. Bonner Bridge Replacement Study Merger Team members included representatives from the following environmental resource and regulatory agencies in addition to NCDOT and FHWA:

- USACE;
- USEPA;
- USFWS (Raleigh Office);
- USFWS—Pea Island National Wildlife Refuge;
- NMFS;
- NPS—Cape Hatteras National Seashore;
- NCDENR
 - Division of Coastal Management (DCM)
 - Division of Marine Fisheries (DMF)
 - Division of Water Quality (DWQ)
 - Wildlife Resources Commission (WRC); and
- North Carolina Department of Cultural Resources—SHPO.

The US Coast Guard is not a signing team member but is sent information before and following all NEPA/Section 404 Merger Team meetings.

NEPA/Section 404 Merger Team meetings allow for early formal involvement in the project development process for state and federal environmental resource and regulatory agencies. Participating agencies are those that have an interest in the issuance of USACE dredge and fill permits for wetland and stream impacts under the terms of Section 404 of the Clean Water Act.

The NEPA/Section 404 merger process is a streamlining effort that helps to avoid duplication of effort between the NEPA and Section 404 processes, since the USACE must meet the requirements of the NEPA in order to issue a dredge and fill permit under the Clean Water Act. The NEPA/Section 404 Merger Team meetings provide an opportunity for participants to formally concur with key decisions in the NCDOT's and the FHWA's National Environmental Policy Act impact assessment process so that those decisions do not need to be revisited during application for a USACE's permit.

The merger process includes the following concurrence points:

1. Concurrence on purpose and need;
2. Concurrence on the alternatives to be evaluated in detail in the environmental document;
- 2A. Concurrence on the approximate length of any proposed bridges to minimize impacts to wetlands and streams and preliminary alignment review for each detailed study alternative;
3. Concurrence on the Least Environmentally Damaging Practicable Alternative (LEDPA);
- 4A. Concurrence that all efforts were made to avoid and minimize harm to jurisdictional resources (streams and wetlands) to the maximum extent practicable;
- 4B. Concurrence on the 30 percent complete hydraulic design; and
- 4C. Concurrence on permit drawings after the hydraulic design is complete and prior to Section 404 permit application.

Concurrence Points 1, 2, and 2A occur prior to the release of a draft document (typically either an Environmental Assessment or Draft Environmental Impact Statement). Concurrence Points 3 and 4A occur after public and agency review processes for a draft document. Concurrence Points 4B and 4C occur during project final design.

The sections that follow describe four meetings that led to concurrence on points 1, 2, and 2A (which contributed to scoping the SDEIS) as well as a fifth briefing related to the development of the Parallel Bridge Corridor alternatives.

8.3.1.1 July 31, 2002 Meeting

The purpose of the first NEPA/Section 404 Merger Team meeting was to discuss the purpose and need of the Bonner Bridge replacement project, the relation of the project to the proposed NC 12 hot spot projects, and the project study area. Participants agreed that:

- The project area would be extended south to Rodanthe to encompass three locations (or hot spots) where overwash of NC 12 during storms is a particular problem;

- Data on locations of submerged aquatic vegetation (SAV) in Pamlico Sound for the project area would be gathered in order to determine if and where impacts to SAVs can be avoided and minimized;
- A study area should be established and impacts to wetlands should be avoided and minimized to the extent practicable;
- If a bridge replacement alternative is selected that does not end in Rodanthe, a future extension of the replacement bridge to Rodanthe must be considered; and
- The southern termini of the replacement bridge should be at least south of the northernmost hot spot (Canal Zone).

Concurrence was reached on the project's Statement of Purpose and Need (presented in Chapter 1). The signed concurrence form for Concurrence Point 1 is included in Appendix D.

8.3.1.2 February 12, 2003 Meeting

The purpose of the second NEPA/Section 404 Merger Team meeting (for Concurrence Point 2) was to identify the Bonner Bridge replacement corridor(s) to assess in detail in the SDEIS. Concurrence was reached on two corridors for detailed assessment in the SDEIS: Corridor Alternative 1 *wide* and Corridor Alternative 4. This decision was revisited at the July 23, 2003 meeting, which is described in the next section. The assessment of corridor alternatives that was the basis for this decision is presented in Section 2.3 of the FEIS and in Figure 2-3.

Scoping-related issues discussed at the meeting were:

- Migratory waterfowl is important within the Refuge.
- Hunt clubs that pre-date the Refuge might have historical importance.
- Islands on the Pamlico Sound side of Hatteras Island are candidate Wilderness lands and are currently managed as Wilderness lands. They could be affected by the project.
- Commercial and recreational fishing activities in the area could be affected by construction. Oyster shells have been planted in the vicinity of Corridor 1 *wide*. Corridor 4 could affect localized fishing pound nets and crab pot sets.
- Coordination related to SAV mitigation should begin early and be coordinated with groups that are already working on SAV issues.
- Construction techniques and work staging areas should be analyzed as they could influence bridge location decisions.
- The effects of the possible removal of the terminal groin at the northern end of Hatteras Island could be important when determining the location of navigation spans for a replacement bridge.
- The public will want to know if, and what type of, alternate access will be provided on Hatteras Island within the Refuge, the Seashore, and fishing opportunities at Oregon Inlet if

the current easement for NC 12 is abandoned by the NCDOT north of the southern terminus of a replacement bridge.

- Provisions for bicycles on the replacement bridge should be considered.
- Stormwater management and pile installation techniques should be discussed in the SDEIS.
- Consider using Bonner Bridge components for an artificial fishing reef when it is demolished.
- The effect of a Corridor 1 *wide* alignment upon the implementation of long-term solutions to NC 12 overwash should be considered.

8.3.1.3 July 23, 2003 Meeting

The main objectives of this meeting were to discuss revising Concurrence Point 2 (selection of corridor alternatives to be studied in the SDEIS), to identify alignment locations to evaluate within the corridor, and to discuss bridge lengths (Concurrence Point 2A).

The USFWS indicated that in order to issue a permit for a replacement bridge landing in the Refuge, such a replacement bridge would have to be determined to be compatible with the purpose and mission of the Refuge, per the National Wildlife Refuge System Improvement Act of 1997. Based largely upon serious reflection and coordination within the USFWS since the February 12, 2003 meeting, the Refuge had concluded that it was unlikely that Corridor Alternative 1 could be determined compatible. The NEPA/Section 404 Merger Team therefore concurred to drop Corridor Alternative 1 *wide* from further consideration and focus the attention of the SDEIS on Corridor Alternative 4 (referred to in the SDEIS as the Pamlico Sound Bridge Corridor.) The NEPA/Section 404 Merger Team also concurred that the bridge should be placed approximately 1 mile (1.6 kilometers) farther west than agreed to at the February 12, 2003 meeting. This would place the bridge in deeper water and thereby reduce the need for dredging during construction.

The NEPA/Section 404 Merger Team also concurred that two termini options at Rodanthe should be evaluated in the SDEIS, Segment A (Curved Rodanthe Terminus) and Segment C (Intersection Rodanthe Terminus). The assessment of alignment alternatives that was the basis for these decisions is presented in Section 2.4 of the FEIS and in Figure 2-4.

The signed concurrence forms for Concurrence Points 2 and 2A are presented in Appendix D. This decision was revisited again at the July 26, 2004 meeting, which is described in the next section.

8.3.1.4 July 26, 2004 Meeting

The NEPA/Section 404 Merger Team Co-Chairs met to discuss the addition of the Parallel Bridge Corridor to the alternatives to be evaluated in detail in the SDEIS. The attendees included members of the following agencies: the NCDOT, the USFWS—Pea Island National Wildlife Refuge, the USACE, the FHWA, and the NCDENR Division of Water Resources.

The Parallel Bridge Corridor was defined as including both a bridge over Oregon Inlet immediately west of Bonner Bridge, as well as the maintenance of NC 12 to Rodanthe for the life of the project. Thus, both the Parallel Bridge Corridor and the Pamlico Sound Bridge Corridor would provide vehicular transportation between Bodie Island (and populated areas to the north) and the first populated area on Hatteras Island (Rodanthe). It was agreed that a variety of means

for the long-term maintenance of NC 12 should be assessed, including combinations of one of more of the following:

- Road relocation;
- Dune reconstruction;
- Beach nourishment;
- Elevated roadway; and
- Bridging of hot spots or island breaches.

It was also discussed that borrow sources would need to be assessed with any NC 12 alternatives that include beach nourishment or dune maintenance. Also, if NC 12 leaves the existing easement, the Refuge's compatibility process would be triggered, and the project would require a compatibility determination from the USFWS.

The NCDOT representative indicated that, based on conversations with the remaining members of the NEPA/Section 404 Merger Team, there was a consensus that as defined above, the Parallel Bridge Corridor should be evaluated in detail in the SDEIS. The Co-Chairs agreed to circulate a concurrence form to the other NEPA/Section 404 Merger Team members without calling a formal meeting. The signing of the revised concurrence form for Concurrence Point 2 (included in Appendix D) was completed on October 13, 2004.

8.3.1.5 May 24, 2005 Briefing

NCDOT briefed the NEPA/Section 404 Merger Team on the Parallel Bridge Alternatives to be evaluated in detail in the SDEIS: Nourishment, Road North/Bridge South, and All Bridge. Several NEPA/Section 404 Merger Team members had previously participated in other meetings on January 7 and April 4, 2005 (see Sections 8.5.1.3 and 8.5.2.3) to develop NC 12 alternatives. No major comments or concerns were received.

8.3.2 Other Agency Meetings

In addition to the NEPA/Section 404 Merger Team meetings, the NCDOT met with representatives of various environmental resource and regulatory agencies to discuss specific issues related to natural and cultural resources within and near the project corridor.

On November 13, 2002, a meeting was held with representatives of the Refuge and the Seashore. The following items were discussed during the meeting:

- The area around the freshwater ponds within the Refuge has high concentrations of both shorebirds and other migratory birds as well as considerable recreational use. These factors are important considerations when deciding where to place a replacement bridge in the Refuge.
- Bridge construction techniques and their impacts are important considerations.
- The bridge should be kept on structure until it is very close to its connection with NC 12 in order to minimize wetland disturbance.

- Both agencies preferred the longer bridge alternative (Corridor Alternative 4/Pamlico Sound Bridge Corridor).
- The project must be compatible with USFWS and NPS objectives.

On June 5, 2003, the NCDOT met with representatives of the NCDENR Division of Coastal Management, the NCDENR Division of Marine Fisheries, and the National Marine Fisheries Service. The agencies discussed the possible selection of a bridge replacement corridor in Pamlico Sound utilizing existing SAV data compiled by the National Marine Fisheries Service (photo-interpreted from 1988 and 1990 aerial photography) and by the NCDENR Division of Marine Fisheries (from boat surveys conducted between 1995 and 2001).

The agency representatives at the meeting indicated they were agreeable to moving forward with corridor selection, particularly if the NCDOT chose a corridor that was in water depths of 6 feet (1.8 meters) or greater where SAVs are unlikely to exist.

On June 11, 2003, NCDOT met with representatives of the Refuge and the FHWA. They discussed the need to conduct a separate study on the future disposition of access within the Refuge. Refuge representatives indicated they would conduct such a study and the NCDOT agreed to participate, as needed.

On July 2, 2003, NCDOT consultant representatives met with the USACE. Comments from the USACE included:

- It is their opinion that removal of the terminal groin would increase their dredging costs and make maintenance of the Oregon Inlet channel much more difficult.
- Pipeline dredging currently is being used west of Bonner Bridge and materials are placed on the small existing islands. The material cannot be taken offshore.

On August 21, 2003, a meeting was held with representatives of the NCDOT, the North Carolina Aquarium Society (owners of the former US Coast Guard Station), and the SHPO. The following items were discussed during the meeting:

- The Aquarium Society owns a 5.12-acre (2.07-hectare) tract in Nags Head that is home to Jeanette's Pier.
- Consideration could be given to moving the (former) Oregon Island US Coast Guard Station at the north end of Hatteras Island to a site adjacent to the Nags Head location.
- The Aquarium Society needs assurance that the station would remain listed on the National Register of Historic Places if it were moved.
- Possible funding options for relocating the station need to be discussed.

In a follow-up telephone conversation on August 27, 2003, the Aquarium Society indicated that the idea of moving the (former) US Coast Guard Station is not an option for them at this time.

On June 28, 2005, NCDOT met with representatives of the SHPO to agree on the effects of the replacement bridge corridor alternatives on four project area resources:

- The (former) US Coast Guard Station at the northern end of Hatteras Island;
- Pea Island National Wildlife Refuge;
- The Chicamacomico Life Saving Station (National Register), which is within the Rodanthe Historic District.

The agreement of the project's effects on these resources is presented on a concurrence form in Appendix D. Potential changes to the historic district boundary, given that one of the contributing structures was moved to the Chicamacomico Life Saving Station site in 2005, also were discussed.

8.3.3 Local Officials Meeting

The NCDOT met with local officials on June 16, 2003 at the request of the Dare County Board of Commissioners. In addition to the Dare County Commissioners, a commissioner from the Town of Duck and a commissioner from the Town of Nags Head attended. The meeting replaced the public officials' meeting that was planned for June 26, 2003, in association with Citizens Informational Workshops. The focus of local government comments was on the importance of maintaining highway access to the recreational activities within the Refuge.

8.4 SDEIS Citizen Involvement

8.4.1 Citizens Informational Workshops

Three Citizens Informational Workshops were held in mid-2003 to:

- Present the corridor alternatives under consideration; and
- Obtain feedback on the merits of the corridor alternatives evaluated in 2002 and 2003 and issues important to consider when selecting the corridor alternatives to be assessed in detail in the SDEIS.

The agenda was informal. The public was invited to come at any time during a three-hour period. Copies of the workshop handouts are included in Appendix E.

The Citizens Informational Workshops were held in Rodanthe (June 26, 2003) at the Rodanthe Waves Salvo Community Center, in Buxton (June 26, 2003) at the Cape Hatteras Secondary School Auditorium, and in Manteo (July 22, 2003) at the Roanoke Island Festival Park Film Theatre. At these meetings, 173 persons registered their presence. Comments were requested and received at the workshops. Eight comment forms were received at the Rodanthe workshop, 15 at the Buxton workshop and eight at the Manteo workshop. Key issues raised by the citizens were:

- A bridge replacement is needed soon;
- The replacement bridge needs turn-offs for bird watching;
- Bike access needs to be considered when designing the replacement bridge;

- Access within the Refuge should be provided if NC 12 is moved from its present location since it is a prime surf fishing and birding area;
- Connect the replacement bridge to NC 12 near the southern terminus of Bonner Bridge and leave NC 12 where it is;
- A bridge from Wanchese to Rodanthe should be considered as an alternative;
- Adequate space should be provided in a few locations on a long bridge for helicopters to land and for emergency vehicles to turn around without going to the other end of the bridge;
- Consider whether a longer bridge might need to be closed earlier during evacuations than would a shorter bridge because of high winds;
- The Texaco (now Liberty) service station in Rodanthe should not be displaced as it is invaluable to the community;
- Corridor Alternative 4 (now Pamlico Sound Bridge Corridor) would affect views of Pamlico Sound from homes;
- Recreational commercial fishing boats use a channel adjacent to Bonner Bridge called “the crack;” and
- The terminal groin should not be removed.

Representatives from the Refuge (USFWS) were present at all three Citizens Informational Workshops. A representative from the Seashore (NPS) attended the July 22, 2003 Citizens Informational Workshop in Manteo.

8.4.2 Newsletter

The NCDOT issued the first project newsletter on SDEIS-related studies in June 2003. The newsletter was mailed to everyone on the project’s mailing list (approximately 10,000 individuals), which includes all Hatteras Island property owners (based on tax records) and those individuals who attended any of the Citizens’ Informational Workshops. Copies of the newsletter were also sent to those on the Refuge’s mailing list.

The newsletter introduced the purpose of studying new replacement bridge corridor alternatives and presented the corridors under consideration. The newsletter also indicated how to contact the study team, including a toll-free phone number (see below). It invited community groups and other stakeholders to request small group meetings with the study team if they wanted additional information or to provide comments on the project. It also announced the two Citizens Informational Workshops held on June 26, 2003. A copy of the newsletter is included in Appendix E.

8.4.3 Toll-Free Telephone Number

A toll-free telephone was announced in the June 2003 newsletter. It is answered by a senior member of the NCDOT’s consultant team. It provides a means for citizens to obtain answers to personal questions about the project and make individual comments at any time during the study.

The phone number is 1-866-803-0529. It has been available throughout the SDEIS, SSDEIS, and FEIS preparation portions of the study.

8.5 Meetings to Consider the Specific Components of NC 12 Maintenance with the Parallel Bridge Corridor

Two series of meetings were held in early 2005 for the purpose of refining the NC 12 maintenance component of the Parallel Bridge Corridor that had been agreed to by the NEPA/Section 404 Merger Team on October 13, 2004. The first series (round one) of meetings focused on identifying specific potential options for the NC 12 maintenance component; the second series (round two) focused on comparing the potential NC 12 maintenance options and selecting those to evaluate in detail in the SDEIS.

Each series consisted of three meetings:

- The first meeting was held with the study team members, as well as representatives from various planning, design, and construction divisions in the NCDOT. At this meeting, the results of study team research were discussed and a recommendation of how to proceed developed.
- The second meeting presented members of NCDOT management with the results of the first meeting for their input.
- The third meeting sought feedback from environmental resource and regulatory agency representatives.

A final decision on how to proceed was made by NCDOT after each series of meetings.

8.5.1 Round One Meetings

Three meetings held in January 2005 focused on identifying of specific potential options for the NC 12 Maintenance component. Participants discussed both the results of high erosion rate modeling of the shoreline in the Refuge from 2010 to 2060 (see Figure E-1 in Appendix E) and the potential for storm-related breaches to occur in the Refuge at five locations (see Section 2.6.2.3).

8.5.1.1 January 4, 2005 Meeting

Meeting participants defined the following NC 12 Maintenance alternatives for consideration at the subsequent two meetings:

- Beach nourishment with dune construction/maintenance to maintain NC 12 in its current location.
- North of and at the Refuge's ponds, relocation of NC 12 as a roadway to a point 230 feet (70.1 meters) west of the predicted 2060 high erosion shoreline, with dunes. Previous NC 12 studies indicate that road maintenance caused by erosion and overwash increases when the distance between the road and the ocean is less than 230 feet (70.1 meters).

- North of the Refuge's ponds, extension of a replacement Oregon Inlet bridge on an alignment that is a minimum of 230 feet (70.1 meters) west of the predicted 2060 high erosion shoreline. Access to the Refuge from NC 12 would be provided near Oregon Inlet.
- At the Refuge's ponds, relocate NC 12 west of the ponds, utilizing the existing dikes as much as possible.
- In the northern Rodanthe area and the southern part of the Refuge, relocate NC 12 onto a bridge just off-shore in Pamlico Sound.
- In the northern Rodanthe area and the southern part of the Refuge, a short-term road relocation adequate to 2020 and then a bridge just off-shore in Pamlico Sound.

A bridge in the existing NC 12 easement was eliminated from consideration because such a bridge would be in the ocean by 2020 and subject to ocean wave action, which would increase the cost of the project. Also, once in the ocean, the bridge could interfere with ocean use by the public and would not provide access to the Refuge, defeating one of the primary objectives of the Parallel Bridge Corridor. This decision was affirmed at subsequent meetings.

8.5.1.2 January 6, 2005 Meeting

The alternatives identified at the January 4th meeting were discussed with NCDOT management representatives. The decisions from the first meeting were affirmed. In addition, the following points were discussed in relation to these alternatives:

- Placing NC 12 on a bridge would allow natural overwash to occur.
- A relocated NC 12 or nourishment alternative would protect the Refuge's ponds from being inundated by the ocean as the shoreline continues to advance towards the ponds.
- A relocated NC 12 west of the Refuge's ponds would cut the Refuge in half, but it could reduce the wetland impact of roadway relocation.
- A project in the Parallel Bridge Corridor could be phased as funding is available. A replacement bridge across Oregon Inlet could be built immediately and then followed by construction of the NC 12 maintenance component as needed.
- Protection or relocation of NC 12 would not resolve shoreline erosion expected in Rodanthe.

8.5.1.3 January 7, 2005 Meeting

The alternatives identified at the January 4th meeting were discussed with representatives from the USFWS (Pea Island National Wildlife Refuge), the USACE, the NCDENR Division of Water Quality, the NCDENR Division of Coastal Management, and the FHWA. It was suggested that the relocation of NC 12 on a bridge 230 feet (70.1 meters) west of the 2060 high erosion shoreline in the Refuge's ponds area be added to the list of alternatives; this addition was made. Other comments and discussions were:

- It may be unlikely that the NC 12 maintenance options outside of the existing easement would be permitted by the USFWS, but the study team should continue to examine them.

- The current location of NC 12 is interrupting natural processes (i.e., overwash) within the Refuge, so NC 12 itself is really not compatible with the Refuge. Bridging NC 12, even over land, could be more compatible because it would cause less interruption to natural processes within the Refuge.
- Bird mortality could increase with bridging NC 12 within the Refuge.
- The relocation of NC 12 along the dikes to the west of the ponds would include impacts to Refuge infrastructure (e.g., pump stations), impacts to bird flight paths, and impacts to trails used by bird watchers. Storm surges from the Pamlico Sound could affect NC 12 if it is relocated along the west side of the island.
- An NC 12 relocation as a roadway would have extensive wetland impacts.
- The practicality of building a connector bridge from a Pamlico Sound Bridge to the north end of Hatteras Island for Refuge access was discussed. This alternative was not added because of the high cost and, without the maintenance of NC 12 to the south, users would have no place to go in their automobiles once reaching Hatteras Island.
- If a breach were to open in the Rodanthe area, finding an adequate source of sand to close such a breach could be very difficult and potentially environmentally damaging.
- A compromise solution of building the Pamlico Sound Bridge, as well as the Rodanthe area bridge, was discussed. Such an approach would provide reliable access to Rodanthe and the rest of Hatteras Island, as well as the southern 5.5 miles (8.9 kilometers) of the Refuge. Such an alternative could be selected as the Preferred Alternative based on the assessment contained in the SDEIS.

8.5.2 Round Two Meetings

A second series of meetings was held in March and April 2005 for the selection of the specific Parallel Bridge Corridor with NC 12 Maintenance Alternatives to be assessed in detail in the SDEIS. Functional design, cost, and environmental impact potential findings developed by the study team for the potential alternatives identified at the first round of meetings were presented.

8.5.2.1 March 22, 2005 Meeting

Meeting participants discussed the design, cost, and environmental impacts of the potential alternatives. With the nourishment alternative, sand availability and impacts to the beaches' invertebrate population were discussed, including the potential for a reduction in abundance and diversity of species; the quality of available sand; and the risk of losing the USFWS permit for beach nourishment partially into a 50-year nourishment program because of ongoing impacts to invertebrate populations. Other points of discussion were:

- The continued accommodation of fishing that is currently available via the catwalks on Bonner Bridge.
- Dropping the alternative of relocating NC 12 west of the Refuge's ponds because of its impact to Refuge facilities.

- Presenting at the remaining meetings a representative combination of NC 12 Maintenance alternatives that include a bridge in the Rodanthe area and nourishment at both the Refuge's ponds and the area north of the ponds. Since nourishment is very costly in the Rodanthe area, it might be reasonable to drop it as an alternative at this time.

8.5.2.2 *March 31, 2005 Meeting*

Study findings and observations from the first round two meeting were discussed with NCDOT management representatives. Items discussed included:

- The strong preference of Dare County to include catwalks on the Oregon Inlet bridge at its south end and the challenges associated with accommodating this request.
- The rapid escalation of construction costs since 2003.
- The results of the NC 12 Task Force sand source study. The study identified several sources of sand, so the sand for nourishment is potentially available, but the quality of the sand is unknown. Participants discussed the potential for a cooperative effort between the NCDOT and the USACE to use sand dredged from Oregon Inlet for nourishment, potentially reducing costs for both agencies.
- The potential for storm-caused breaches on Hatteras Island and the risk breaches present to the various alternatives.
- Dropping the alternative of relocating NC 12 west of the Refuge's ponds because of its impact to Refuge facilities.
- The practicality of building a Pamlico Sound Bridge, as well connecting bridges to the Refuge on the north (a connector bridge from a Pamlico Sound Bridge to the north end of Hatteras Island) and south (relocating NC 12 onto a bridge in the Rodanthe area).

8.5.2.3 *April 4, 2005 Meeting*

The third meeting again involved environmental resource and regulatory agency representatives including: the USFWS, the USACE, the NCDENR Division of Water Quality, the NCDENR Division of Coastal Management, and the FHWA. Meeting participants agreed that the alternative relocating NC 12 to the west of the Refuge's ponds should be dropped because of its impact to the Refuge. The alternative of relocating NC 12 in the Rodanthe area to a point beyond the 2020 shoreline and then later building a bridge in Pamlico Sound just west of northern Rodanthe also was dropped because of the potential community and natural resource impact of the short-term relocation. Discussion topics included:

- Specifics related to beach nourishment, including: the minimum project length for beach nourishment, the proposed nourishment cycle, potential sand sources, proposed dune locations and sizes, sand availability, and sand characteristics needed to be compatible with Refuge beaches.
- Potential breaches, including an agreement that when relocating NC 12 on a bridge, the bridge would span potential Hatteras Island breach locations.

- The potential need for more study on the availability of sand and its characteristics for nourishment, dunes, and closing breaches before a decision were made to select nourishment as the Preferred Alternative for NC 12 maintenance and the preparation of a FEIS.
- The need to evaluate in detail in the SDEIS multiple ways to maintain NC 12 through the Refuge until 2060, because all of the different alternatives have both positive and negative aspects.
- The NEPA/Section 404 Merger Team should be briefed on the findings of these efforts to define the specifics of NC 12 maintenance. (This briefing occurred on May 25, 2005 and is discussed in Section 8.3.1.5.)

The study team's final decision on the NC 12 Maintenance alternatives for the Parallel Bridge Corridor is presented in Section 2.6.4.

8.6 North Carolina Legislation Related to Bonner Bridge Replacement

During its 2005 Session, the North Carolina General Assembly passed the following legislation (House Bill 747) related to the replacement of Bonner Bridge:

- Contract for Accelerated Construction of the Herbert C. Bonner Replacement Bridge Project. The [North Carolina] Department of Transportation shall implement all reasonable measures to expedite completion of environmental reviews required by the National Environmental Policy Act. Within 90 days of receiving an approved Record of Decision from the Federal Highway Administration, the Department shall contract with a single private entity to design and build a replacement bridge for the Herbert C. Bonner Bridge at Oregon Inlet, in accordance with G.S. [general statute] 136-28.11, in order to expedite and accelerate the efficient, cost-effective completion of the project.
- Replacement Bridge. The General Assembly recommends that the replacement bridge constructed pursuant to this section be located with north and south termini in general proximity to the termini at the existing Herbert C. Bonner Bridge. It is recognized, however, that the Preferred Alternative for the bridge location cannot be determined prior to compliance with all Federal and State laws and regulations.
- Department to Report on Project. The Department shall report to the Joint Legislative Transportation Oversight Committee on December 1, 2005, and each December 1 thereafter until completion, on the progress of the accelerated bridge project described in this section.

8.7 SDEIS Newsletter and Public Hearings

Two Public Hearings were held following publication of the SDEIS in September 2005. The first Public Hearing was held on November 9, 2005, at the Dare County Justice Center in Manteo. The second Public Hearing was held on November 10, 2005, at the Rodanthe-Waves-Salvo Community Center in Rodanthe. Citizens Informational Workshops were held prior to each Public Hearing. The purpose of the hearings was to give citizens the opportunity to express their opinions about the project and the various alternatives analyzed in the SDEIS. Approximately 207 people attended the two Public Hearings and 33 spoke. Written comments also were

received from both the public and several state and federal agencies. Responses to these comments are provided in Section 8.11.

To announce the publication of the SDEIS, the NCDOT issued a second project newsletter in October 2005. The mailing list used to distribute the newsletter once again contained approximately 10,000 individuals, including all property owners on Hatteras Island (from tax records' addresses), individuals on the Refuge's and Seashore's mailing list, and other individuals who requested to be on the mailing list. The newsletter also was made available to individuals who attended the November 2005 Public Hearings and Pre-Hearing Open House Workshops.

The newsletter included a summary of the factors important to the selection of a Preferred Alternative, as well as two summary tables comparing the replacement bridge corridor alternatives based on the detailed evaluations in the SDEIS. The first table compared the alternatives based on: key community and cultural resource impacts; key natural resource impacts; and other considerations. The second table compared the alternatives based on estimated project costs. The newsletter also included: an announcement of the two upcoming Public Hearings and Pre-Hearing Open House Workshops along with the schedules and locations; a map showing the two replacement bridge corridor alternatives; information on how to comment on the project and how to contact the study team, including the toll-free phone number; locations at which the SDEIS and corridor maps were available for public review; and information on the next steps in the project development process. A copy of the newsletter is included in Appendix E.

The SDEIS and the public hearing announcement were posted on the Outer Banks Task Force web site (<http://www.obtf.org/>).

8.8 Agency Coordination between the SDEIS and the 2007 Supplement to the SDEIS

Three meetings of the project's NEPA/Section 404 Merger Team were conducted following the 2005 Public Hearings. NCDOT and FHWA hosted a Phased Approach Alternative Constructability Workshop at which Mike Bryant, manager of the Refuge, made opening remarks. A letter from the US Secretary of the Interior was sent to US Senator Richard Burr related to the project and its alternatives. The key meetings and the letter are described in the paragraphs below.

8.8.1 NEPA/Section 404 Merger Team Meetings

The sections that follow describe the three NEPA/Section 404 Merger Team meetings held following the release of the SDEIS.

8.8.1.1 *June 15, 2006 Meeting*

The purpose of this NEPA/Section 404 Merger Team meeting was to update the Merger Team on what was then an additional alternative being considered (the Phased Approach alternatives [including the Preferred Alternative] assessed in the SSDEIS and this FEIS), and to update the Merger Team on revised and augmented public cost estimates on both the alternatives assessed in the SDEIS, as well as the additional alternatives. Merger team members posed questions and made comments throughout the meeting. Issues discussed at the meeting included:

- Assumptions made for various costs, including both highway related and other public costs;
- The connection between the Parallel Bridge Corridor alternatives and ongoing long-range and interim NC 12 maintenance studies being conducted by the OBTF within the Refuge and Rodanthe areas, including cost considerations;
- The merits of introducing non-highway project related potential public costs into project cost comparisons;
- The differing costs between relocating utilities on a bridge and relocating utilities on land;
- Assumptions related to the potential for a storm-related breach in the Refuge;
- Refuge representatives indicated that they were not certain if the Phased Approach Alternative, if pursued and confined to the existing NC 12 easement, would have to undergo a Refuge compatibility review;
- The merits of studying alternatives for which funding is not currently allocated; and
- An engineering study of the Phased Approach Alternative would be conducted; the results of this study would determine whether it would be presented to the Merger Team for concurrence as a detailed study alternative.

8.8.1.2 September 21, 2006 Meeting

The purpose of the second NEPA/Section 404 Merger Team meeting was to discuss the Final Report of the Bonner Bridge Constructability Workshop (the engineering study discussed at the June 15 meeting), which took place from August 29 to 31, 2006 in Kill Devil Hills, and to decide whether a revised Concurrence Point 2 Agreement should be signed to include the Phased Approach Alternative so it could be evaluated in the SSDEIS.

Issues discussed at the meeting were:

- The purpose, process, and outcome of the Constructability Workshop;
- The NCDOT and FHWA's desire to conduct a full assessment of the Phased Approach Alternative that would be presented in a SSDEIS and compared with the alternatives assessed in the SDEIS;
- The merits of the Phased Approach Alternative in terms of whether its impacts would be comparable to the alternatives assessed in the SDEIS and, thereby, its reasonableness as a detailed study alternative;
- That the SSDEIS would focus on assessing the Phased Approach Alternative and that comments made on the SDEIS would be addressed together with comments on the SSDEIS in the FEIS;
- Issues related to the implementation of the Phased Approach Alternative, including: regular construction within the Refuge over the long-term as each phase is built; assurance of the long-term availability of construction funding; design features of a bridge that ultimately would be in the ocean; and procedures for meeting NEPA requirements in future phases;

- The desire of the Merger Team for more information on the potential impacts of the Phased Approach Alternative; and
- Whether the Phased Approach Alternative fit within the definition of the Parallel Bridge Corridor approved for detailed study in 2004.

The Merger Team agreed that the Phased Approach Alternative fit within the definition of the Parallel Bridge Corridor approved for detailed study in 2004. The NCDOT agreed to meet again with the Merger Team to brief them on details related to its characteristics and impacts at a future date.

8.8.1.3 December 14, 2006 Meeting

The purpose of the third NEPA/Section 404 Merger Team meeting was to present for discussion the functional designs of the two Parallel Bridge Corridor with Phased Approach alternatives (including the Preferred Alternative) and discuss potential impacts in advance of the release of the SSDEIS. Items discussed at the meeting included:

- Whether the life span of the Phased Approach alternatives' (including the Preferred Alternative) bridges would be shortened as a result of being in a harsh ocean environment; it was noted that an American Association of State Highway and Transportation Officials (AASHTO) task force is developing new specifications for the design of bridges subject to coastal storm events;
- For presentation in the SSDEIS, new costs for the replacement bridge corridor alternatives were being developed that update those presented at the June 15, 2006 Merger Team meeting;
- Beginning 10 to 20 years from now, the Phased Approach alternatives' (including the Preferred Alternative) bridges will be in the surf, that most of the bridges will be offshore by 2060, and that the actual shoreline location will depend upon the timing of future storms;
- Potential short-term changes to NC 12 are being considered in the Bonner Bridge cost estimates by assuming continued major maintenance to the Canal Zone Hot Spot and a round of nourishment at the Rodanthe 'S' Curves Hot Spot;
- AASHTO guidelines will be followed and the hydraulics will be modeled during bridge design to ensure adequate pile lengths;
- The Oregon Inlet bridge would have a series of navigation spans, which would be designed to withstand ship impact; fenders are generally used only at the navigation span in use and are moved as needed;
- The decision to place the Phased Approach alternatives' (including the Preferred Alternative) bridges on the ocean side of the existing NC 12 easement with the temporary traffic maintenance road on the sound side was made at the August 2006 workshop;
- Bridges would be closed by emergency management during a storm when sustained wind speeds are over 60 mph, as is the policy used for Bonner Bridge; and
- That a barge could be used to move the (former) Oregon Inlet US Coast Guard Station to a location north of the inlet.

At the conclusion of the meeting, it was noted that the SSDEIS would likely be distributed in early February 2007, followed by a Public Hearing and subsequent comment period. It was also noted that the Merger Team meeting to select the LEDPA would be held soon after the comment period ends.

8.8.2 Phased Approach Constructability Workshop

A Constructability Workshop was held August 29 to 31, 2006 in Kill Devil Hills, North Carolina. The purpose of the workshop was to examine the technical feasibility of the Phased Approach Alternative. Mike Bryant, the manager of the Refuge, spoke as a part of the opening welcome. The workshop is described in Section 2.7 of the FEIS.

8.8.3 US Secretary of the Interior Letter

The Secretary of the US Department of the Interior (DOI) sent a letter dated July 5, 2006 to US Senator Richard Burr in response to the Senator's concern for the need to replace Bonner Bridge. The letter is presented in Appendix A. In the letter, the Secretary noted that it is important for coordination to occur between DOI and the State of North Carolina in finding a way to replace the bridge as soon as possible to protect the health and safety of the public.

The Secretary indicated that he believed that the best way to proceed would be to separate the replacement of Bonner Bridge, a project whose delay could constitute a clear and present safety issue for all concerned, from the more difficult and less urgent issues of the realignment of NC 12. The letter indicated that DOI believes the replacement of the bridge itself could be accomplished in a way which is compatible with the National Wildlife Refuge System Improvement Act of 1997, and other laws, if it is constructed within the same easement or with minor changes to the current easement. With this understanding, the letter said that NCDOT could quickly conclude their planning and begin construction of a bridge to replace the existing bridge that Senator Burr stated is an imminent threat to public safety.

The Secretary pledged the support of DOI to allow replacement of the bridge, providing safe transportation while protecting important wildlife resources on the Refuge.

A similar letter also was sent to North Carolina Governor Michael F. Easley.

DOI sent an additional letter on September 11, 2007 to North Carolina Governor Michael F. Easley (see Appendix A). The Acting Assistant Secretary for Fish and Wildlife and Parks reminded the Governor of previous correspondence and of USFWS' participation on the NEPA/Section 404 Merger Team. He noted that USFWS requested additional information in DOI's SSDEIS comment letter (this information is included in this FEIS). He expressed concern about the effect on the Refuge of the construction of the Preferred Alternative in phases over a long period of time. He said that USFWS believes NCDOT will need to apply for a permit to build the Preferred Alternative in the existing NC 12 easement, and that USFWS would determine if the project was compatible with the mission of the Refuge in the context of considering that permit application. He also indicated that USFWS believes that building the Preferred Alternative in phases would result in continued maintenance outside of the existing road's right-of-way through the Refuge until each subsequent phase of bridge construction along NC 12 is completed.

8.9 2007 Supplement to the SDEIS Newsletter and Public Hearings

Two public hearings were held following the February 2007 publication of the SSDEIS. The first Public Hearing was held in Manteo on March 28, 2007, at the Dare County Justice Center. The second Public Hearing was held in Rodanthe on March 29, 2007, at the Rodanthe-Waves-Salvo Community Center. Both hearings were preceded by Citizens' Informational Workshops. The purpose of the hearings was to give citizens the opportunity to express their opinions about the project and all of the alternatives analyzed (including the two new Phased Approach alternatives [including the Preferred Alternative]) in the SDEIS and SSDEIS. Approximately 244 people attended the two Public Hearings, and 39 spoke. Representatives from the USACE, FHWA, NPS, and USFWS also attended these meetings. Written comments also were received from both the public and several state and federal agencies. Responses to these comments are provided in Section 8.11.

The NCDOT issued a third project newsletter to announce the SSDEIS in February 2007. The mailing list used to distribute the newsletter again contained approximately 10,000 individuals, including all property owners on Hatteras Island (based on current tax records), individuals on the Refuge's and Seashore's mailing list, and other individuals who requested to be on the mailing list. The newsletter also was made available to individuals who attended the 2007 Citizens' Informational Workshops and Public Hearings for the SSDEIS.

The newsletter included two summary tables comparing the replacement bridge corridor alternatives based on the detailed evaluations in the SDEIS and the SSDEIS for the Phased Approach alternatives (including the Preferred Alternative). The first table compared the alternatives based on: key community and cultural resource impacts; key natural resource impacts; and other considerations. The second table compared the alternatives based on estimated project costs. The newsletter also included: an announcement of the two upcoming Public Hearings and Citizens Informational Workshops along with their schedules and locations; a map showing the two replacement bridge corridor alternatives; a brief summary of the factors important to selecting a Preferred Alternative; information on how to comment on the project and how to contact the study team, including the toll-free phone number; locations at which the SSDEIS and corridor maps were available for public review; and information on the next steps in the project development process. A copy of the newsletter is included in Appendix E.

The SSDEIS and the public hearing announcement were posted on the Outer Banks Task Force web site (<http://www.obtf.org/>) for public review.

8.10 Merger Team Meetings Associated with Selection of the Preferred Alternative

8.10.1 Merger Team Meetings

Three meetings were held with the NEPA/Section 404 Merger Team to select the LEDPA. The following sections describe each of these meetings.

8.10.1.1 May 23, 2007 Meeting

The purpose of this NEPA/Section 404 Merger Team meeting was to present for discussion the detailed study alternatives and their potential impacts and to identify the LEDPA (Concurrence Point 3). The NCDOT sought consensus on the Parallel Bridge Alternative with Phased Approach/Rodanthe Bridge Alternative (Preferred) as the LEDPA. General discussion items included:

- Whether or not the alternative constituted a constructive use of the Refuge as a Section 4(f) resource. FHWA indicated that they had concluded there was no constructive use.
- Why the cost estimates for the Pamlico Sound Bridge Corridor increased by a much larger percentage from the SDEIS to the SSDEIS than for the Parallel Bridge Corridor alternatives.
- Why innovative financing could not be used to implement the Pamlico Sound Bridge. A handout titled “1989 Equity Formula” was distributed. The legislative intent of the formula is to spread funds throughout the state. The handout showed how NCDOT distributes funds between its geographic Divisions based on the 1989 Equity Formula, the amount of funding that Division 1 (which includes the project area) received in the 2007-2013 Transportation Improvement Program (TIP) (approximately \$548 million), and that Division 1 would not exceed \$1 billion in cumulative funding until 2021.
- If funding is not available for a particular alternative, the alternative is not reasonable and feasible and should not be put forth in NEPA documents.
- There are only two alternatives that cost less than \$1 billion – the Nourishment Alternative and the Road North/Bridge South Alternative. However, the agencies have serious concerns related to sand compatibility issues with the Nourishment Alternative and the Road North/Bridge South has substantial impacts to the Refuge outside of the existing easement. These issues were also important in NCDOT’s decision to recommend the Phased Approach/Rodanthe Bridge Alternative.

Individual agencies stated the following positions related to the selection of the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative:

- DCM can support the Parallel Bridge (Phase I), but not the Phased Approach Alternative’s NC 12 bridges that would be built in extremely threatened locations, eventually being located on the beach and in the surf zone. This concept goes against the fundamental management objectives of the Coastal Area Management Act (CAMA) related to not building on the beach and DCM cannot support it. The only exception they allow to this objective is public fishing piers.
- NMFS still has concerns that have not been addressed about the long-term impacts of the Phased Approach on the beach invertebrate community and the beach fisheries community. They did not agree with the assessment in the SSDEIS that there is no net loss of habitat for these species with the Phased Approach. They believe that there are concerns related to the eventual location of bridges in the surf zone not adequately addressed in the SSDEIS.
- USEPA had objected to the Parallel Bridge Corridor in writing. USEPA requested further information on the funding issue. Once they have this information, they will re-open their NEPA review and reconsider their determination of their Preferred Alternative.

- USFWS could not concur on the LEDPA at the meeting. They would like further information in response to their SDEIS and SSDEIS comments. In addition, although the Pamlico Sound Bridge has apparently been eliminated based on funding/costs, they would like further information to determine if other alternatives also should be eliminated from a cost basis. Also, although some alternatives are apparently not practicable from a cost basis, they do not have enough information to determine if other alternatives are practicable from a regulatory basis, including compatibility. The Parallel Bridge Corridor alternatives would not likely be compatible with the Refuge according to the Refuge manager.
- NPS could not concur on the LEDPA that day.
- FHWA could concur on the LEDPA as the Phased Approach/Rodanthe Bridge Alternative (Preferred).
- WRC was not represented at the meeting but indicated in a letter that WRC did not oppose NCDOT's selection of the Phased Approach/Rodanthe Bridge Alternative (Preferred) as the LEDPA.
- DMF also was not represented and their letter did not state whether DMF concurred with NCDOT's choice of the LEDPA. The letter indicated that recreational fishing opportunities should be provided equivalent to the current opportunities with the replacement bridge. It also stated that once Bonner Bridge is demolished, suitable rubble material should be used to create artificial fishing reefs in North Carolina's coastal fishing public trust waters.
- DWQ could concur with the Oregon Inlet bridge component of the Phased Approach Alternative, but not the components of the Phased Approach south of Oregon Inlet (i.e., the bridges that would be located in the ocean in the near future).
- State Historic Preservation Office could not concur on the LEDPA until they have further information from FHWA on whether the Phased Approach constituted a constructive use of Refuge lands.
- USACE is not ready to concur on NCDOT's LEDPA. They asked for more information, in writing, on the alternative funding/costs issues.

At the conclusion of the meeting, it was noted that the next step is for each of the agencies to provide written documentation to NCDOT as to what their specific concerns and needs for further information are at this point. NCDOT indicated that once they reviewed the concerns, they would decide whether to try and provide additional documentation to address the agency concerns and meet with the Merger Team again or to elevate the project to the Merger Implementation Team.

8.10.1.2 June 20, 2007 Meeting

At the second Concurrence Point 3 meeting of the NEPA/Section 404 Merger Team, NCDOT presented for discussion additional cost information on the alternatives, additional information on funding sources and the equity formula, and how that information relates to programming of the proposed project in the TIP. NCDOT engineers also answered cost-related questions that were included in the comments on the 2007 SSDEIS and in the Issue Briefs submitted by Merger Team members after the May 23 meeting. This only was an information meeting; concurrence on the LEDPA was not requested. Handouts discussed included:

- A Bonner Bridge Preliminary Estimates notebook, which included NCDOT's documentation for its cost estimates;
- A handout titled "Estimate-Related Issues" that addressed the estimate-related questions raised by the agencies during their review of the SSDEIS;
- A handout that outlined various funding sources, including the State Infrastructure Bank, GARVEE Bonds, and toll roads. It was noted that NCDOT had sought legislation that would have allowed for GARVEE Bonds to construct this project and other very costly projects; however, the statute that was approved by the NC General Assembly dictated that the bond money be distributed statewide according to the equity formula. With regards to use of toll financing, state law requires that a free route be available as an alternative to a toll road. Currently NC 12 to Bodie Island is the only free route connecting Hatteras Island to the mainland.

Other items discussed included:

- NCDOT's cost estimates were affirmed by two independent sources, the firm of Finley Engineering, which has experience in designing and building coastal bridges, and FHWA;
- The basis for cost estimates, including consideration of bids and plans for the I-10 bridge replacement on the Gulf Coast as put together by that project's Design-Build team;
- FHWA emergency relief funding procedures, including the emergency funds that come from a different funding source at FHWA than normal projects.

At the conclusion of the meeting, NCDOT requested that additional questions be provided. Also, NCDOT said they planned to meet with representatives from individual agencies (or groups of agencies) before the next meeting to discuss agency concerns further (see Section 8.10.2). NCDOT indicated that at the next meeting the Merger Team would either need to reach consensus or agree to elevate the decision.

8.10.1.3 August 15, 2007 Meeting

The purpose of the third Concurrence Point 3 NEPA/Section 404 Merger Team meeting was to decide on a LEDPA if a decision could not be reached, NCDOT would elevate the project. Items discussed at the meeting included:

- A review of the project's activity since the May 23, 2007 meeting, including the submittal of issue briefs; the material on costs and funding presented at the June meeting; additional questions on costs, including operations and maintenance costs, provided by USEPA after the June meeting; and individual agency meetings held between the June and August meetings.
- Review of the definition and components of the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative (Preferred) proposed as the LEDPA;
- A description of the FHWA NEPA procedures that would apply to each phase after Phase 1 (Oregon Inlet bridge) that would provide the flexibility to refine future phases of the project, if needed, as the project setting evolves.

Concurrence was not achieved on a LEDPA. The LEDPA decision was elevated based on the Section 404/NEPA Merger 01 Process Guidelines. Nonconcurring or abstaining Merger Team members were asked to prepare updated or new Issue Briefs, if needed. It was noted that the Merger Implementation Team, normally the first level in the elevation process, had agreed already to elevate the decision to the Review Board.

8.10.2 Individual Merger Member Meetings

Prior to the third Concurrence Point 3 meeting (August 15, 2007) for selection of the LEDPA, NCDOT and FHWA held five meetings with individual Merger Team members to discuss in detail their concerns with the LEDPA proposed by NCDOT. The sections that follow list the concerns discussed at each meeting.

8.10.2.1 June 11, 2007 Meeting with USFWS

Attendees at this meeting included representatives of the USFWS (Refuge and Raleigh Field Office), NPS, FHWA, and NCDOT. The following items were discussed:

- USFWS reiterated that any construction outside of the existing NCDOT easement through the Refuge, including emergency actions, would trigger a compatibility determination.
- USFWS said that they have to perform a NEPA analysis on any action that triggers a compatibility determination.
- NCDOT, on average, requests two special use permits per year to repair damage to NC 12 associated with overwash. USFWS can find such actions compatible only if they can assume that there is less than 10 years of impact because a long-term solution, such as the Pamlico Sound Bridge Corridor, is expected.
- USFWS said that because the Phased Approach/Rodanthe Bridge Alternative (Preferred) would constitute a long-term solution to NC 12 needs through the Refuge and the NCDOT says it will stay in the existing easement, USFWS would not be able to allow NCDOT to conduct any more “emergency repairs” or other activities that impact the Refuge outside of the NC 12 easement once the ROD for the Phased Approach is issued.
- USFWS said that NCDOT’s requests for emergency repairs to NC 12 are not really the USFWS’ concern; however, these requests, which have negative impacts on the Refuge and go against the Refuge’s mission, become a problem for USFWS because of the importance of keeping NC 12 open. USFWS feels that there have been too many impacts over too much time with short-term or emergency actions.
- USFWS said that the Phased Approach/Rodanthe Bridge Alternative (Preferred) is supposed to stay within the existing easement through the Refuge so that impacts will be confined to the existing easement, but the NEPA document says that it will actually have impacts outside of the existing easement (e.g., the potential implementation of a short-term relocation of NC 12 in the Rodanthe area). If these impacts are more than “minor,” then the alternative would not be found compatible with the Refuge.
- USFWS said that in the past they have allowed minor changes in the NC 12 easement for safety improvements as long as appropriate mitigation also was provided.

- USFWS does not want to perpetuate the “emergency” in regards to accommodating NCDOT’s requests for emergency repairs to NC 12 that have negative impacts on the Refuge, and they believe that the Phased Approach/Rodanthe Bridge Alternative (Preferred) would cause this to happen.

8.10.2.2 July 5, 2007 Meeting with the NCDENR Division of Coastal Management (DCM)

Attendees at this meeting included representatives of the DCM, FHWA, and NCDOT. The following items were discussed:

- The purpose of the meeting was to discuss DCM’s comments on the design of the Phased Approach/Rodanthe Bridge Alternative (Preferred) that relied upon the estimated 2060 shoreline.
- The topic of shoreline erosion assumptions was discussed. NCDOT indicated that for the FEIS, the project team will need to develop “trigger” criteria for the implementation of the phases of the Phased Approach/Rodanthe Bridge Alternative (Preferred).
- The project team stated that the high erosion shoreline includes a “prediction interval” that accounts for shoreline erosion occurring faster than past trends. Though no additional factor was included for sea level rise trends, the 2060 high erosion shoreline was used in developing all of the Parallel Bridge Corridor Alternatives.
- Discussion included how the shoreline erosion rates used in the SDEIS compare to the DCM shoreline erosion rates. DCM’s rates take into account just two data points and no prediction interval. The two rates are comparable within 1 foot, although there is still some uncertainty in the predicted rates.
- DCM expressed concerns about whether the bridge would be built to withstand extreme conditions. If a bridge is a major evacuation route and its design does not hold up to coastal processes, it will be a detriment to the community. The new bridge design would have to meet any design guidelines being developed as part of the FHWA Wave Vulnerability Task Force. NCDOT recognizes the challenges of locating bridges within an eventual surf zone, but the placement of the bridges are limited by location of the existing NC 12 easement.
- DCM suggested an “Adaptive Management” that would allow NCDOT to proceed with the final design of the Oregon Inlet Bridge and defer the choice of the final option or options for the subsequent phases until a later date. The group discussed why this was not an applicable approach for this project.
- DCM’s position is that construction of permanent bridges in a location that is projected to be in the ocean on or before the project’s design year would be inconsistent with the most basic principles of the Coastal Area Management Act (CAMA) and the Rules of the Coastal Resources Commission (CRC). It is possible none of the alternatives studied could completely comply with the rules of the CRC. Therefore, it is possible that DCM will need to deny a CAMA permit application for any of the alternatives for procedural reasons. In that situation, NCDOT would have the option of petitioning the CRC for a variance to undertake a project that is prohibited by the CRC’s development standards.
- DCM is concerned with bridge piers and approach retaining walls used as they relate to erosion control and structure setback rules.

- DCM is concerned about the lower level of public access to the Refuge with the Phased Approach/Rodanthe Bridge Alternative (Preferred). NCDOT stated there would be more of a guarantee of access with the Phased Approach Alternative than the Pamlico Sound Bridge Alternative.
- DCM questioned what would be done with the Phased Approach/Rodanthe Bridge Alternative's (Preferred) bridges after they are demolished at the end of their service life. The project team said current policies and procedures would be discussed in the FEIS. The difference between the disposal of the Bonner Bridge and the Phased Approach would be the quantity of material to dispose.
- The USFWS sand compatibility criteria for beach nourishment is different than the DCM criteria. Both sets of sediment criteria would need to be satisfied.

8.10.2.3 July 12, 2007 Meeting with the National Marine Fisheries Service

Attendees at this meeting included representatives of the NMFS, USACE, FHWA, and NCDOT. The following items were discussed:

- NMFS stated concerns about structures in the surf zone and how modeling for coastal processes and the assessment of related impacts will be performed. NCDOT explained the modeling.
- NMFS stated concerns of scour at the base of coastal structures related to marine species that utilize the surf zone in general and specifically its value as Essential Fish Habitat (EFH) for red drum. However, the bigger-picture issue is the change over time in the physical makeup of approximately 10 miles (16.1 kilometers) of the beach itself and its ability to support the full range of invertebrates and fishes that utilize the nearshore waters and the surf zone as habitat.
- NMFS felt that surf zone habitat was not adequately addressed in the DEIS and asked how NCDOT would assess the related impacts based upon the information available. They asked whether this assessment would be performed before the next meeting of the Merger Team. NCDOT said that additional studies would be conducted after the LEDPA was selected.
- The NMFS position on the LEDPA is based on information currently available which indicates that impacts to fishery resources, including surf zone EFH and other nearshore habitats, have not been adequately addressed. Therefore, NMFS cannot concur on a LEDPA that directly, indirectly, and cumulatively impacts NMFS trust resources over time and on a large scale when a less damaging alternative is available.
- The USACE representative noted that there also are Clean Water Act Section 404 issues at the current time as well. The representative expressed concern about the lack of information needed in order to grant a Section 404 permit. The other Federal agencies' ability to elevate USACE permit decisions, under Section 404(q), is still available regardless of the Merger elevation process.
- On behalf of the DOI, USFWS has asked the NOAA if the US Department of Commerce (DOC) would join DOI in an informal discussion with the President's Council on Environmental Quality (CEQ) about the project and how CEQ might help resolve differences between the Departments and FHWA.

- The USACE was still wrestling with the Pamlico Sound Bridge Corridor Alternative versus the Parallel Bridge Corridor with Phased Approach Alternative and their main concern was the uncertain nature of the future funding sources.
- NMFS continues to support selection of the Pamlico Sound Bridge Corridor as the LEDPA.

8.10.2.4 July 19, 2007 Meeting with USEPA

Attendees at this meeting included representatives of the USEPA, USACE, FHWA, and NCDOT. The following items were discussed:

- The USEPA requested additional detail on the basis for the operations and maintenance (O&M) costs in the SSDEIS. NCDOT provided the EPA with the original unit cost estimate showing how the O&M costs were generated for the Pamlico Sound Bridge Corridor. Further information was provided at the third Concurrence Point meeting of the Merger Team on August 15.
- The USEPA questioned the accuracy of the project construction cost estimates when compared with those of I-10 on the Gulf Coast. FHWA indicated that they performed an independent review of the costs to verify their accuracy and applicability. Costs to construct other replacement bridges in the country were not complete reconstructions, but were more extensive repairs to existing structures.
- The USEPA asked if rehabilitation activities for the existing Bonner Bridge should have been disclosed in the SSDEIS since they have the potential to push out the schedule of the replacement project. NCDOT indicated that rehabilitation is a temporary solution and was not connected to the bridge replacement alternatives being considered. The rehabilitation would not push out the schedule of the replacement project. A NEPA Categorical Exclusion (CE) was completed for the rehabilitation project (TIP No. B-5014) in June 2007. NCDOT agreed to provide the CE to the Merger Team members at the next merger meeting.
- The USEPA was concerned that adding new bridges along the shore would set up the NCDOT and FHWA for a series of multi-million dollar replacement projects as the planned bridges failed or needed retrofitting prior to their planned design life. The USEPA was also concerned about the need to armor bridge piles once in the ocean.
- The USEPA did not believe that the project complied with the *Coastal Barrier Resources Act*.
- The USEPA suggested that NCDOT consider the need for revising the Concurrence Point 1 and 2 agreements. This was based on the idea that the Merger Team should go back to having the short bridge replacement project with no improvements to NC 12 as one of the alternatives being considered. The USACE representative stated that they did not think that the Merger Team was at that point at this time.
- The USEPA would like to see more information on sea level rise with respect to the coastal processes modeling, specifically for scour. They are concerned that the Phased Approach Alternative/Rodanthe Bridge Alternative (Preferred) may not be reasonable and feasible, if most of the structures will be in the ocean in the design year, and/or if the scour modeling shows significant issues. USEPA does not have adequate information on sea level rise projections or the scour modeling to support that it is a reasonable, feasible alternative.

- The USEPA was concerned with the water quality impact from stormwater runoff from any of the alternatives, and that any stormwater runoff from bridges would have to be treated. There is the potential that an NPDES permit would not be granted should the FEIS demonstrate that the runoff could or would not be treated.
- The USEPA noted there have been some projects where the LEDPA was agreed to without knowledge of future funding sources (e.g., Western Wake Expressway [I-540]), but recognized that some past projects had alternatives dropped because of funding issues (e.g., Blowing Rock). NCDOT noted that roadway projects can be built in parts but not a bridge. The USEPA suggested obtaining a waiver from the State General Assembly so the Pamlico Sound Bridge could be funded.

8.10.2.5 July 25, 2007 Meeting with the NCDENR Division of Water Quality

Attendees at this meeting included representatives of the DWQ, USACE, FHWA, and NCDOT. The following items were discussed:

- The purpose of this meeting was to discuss DWQ's concerns with the Phased Approach/Rodanthe Bridge Alternative (Preferred) related to the cost estimates, and the loss of recreational uses and aquatic life uses of the Atlantic Ocean.
- The possibility of the finished project eventually being in the Atlantic Ocean is not ideal; however, the upfront construction cost of the Pamlico Sound Bridge Corridor makes it not practicable. The other Parallel Bridge Corridors utilize land from the Pea Island National Wildlife Refuge, a Section 4(f) resource. The FHWA said the NC 12 easement within the Refuge is not considered a Section 4(f) resource.
- The DWQ asked about the safety of a bridge that would eventually be in the surf zone. NCDOT consulted with engineers as part of the August 2006 Constructability Workshop and concurred that the project could be built and would be operationally safe.
- The DWQ was concerned about effects to fish, benthic organisms, and use of the beach.
- The DWQ asked if the Record of Decision (ROD) could acknowledge a plan to use phased permitting. FHWA stated this could be done, but the initial ROD must choose an alternative that addresses USFWS compatibility and Section 4(f).
- NCDOT asked if there is a difference between permitting a project that is built on land but later is in the ocean and permitting a project that is initially constructed over the ocean.
- The group discussed the potential to employ CEQ's phased approval process for the Phased Approach/Rodanthe Bridge Alternative (Preferred). NCDOT stated that the project very likely does not fall within the eligibility criteria for employing CEQ's phased approval process. It could have met the criteria if the problems on NC 12 were an anticipated future problem. However, problems on NC 12 exist today.
- The group discussed how a USFWS compatibility determination triggers a Section 4(f) evaluation. The Phased Approach/Rodanthe Bridge Alternative (Preferred) is an avoidance alternative because it stays within the existing NC 12 easement.

- The group discussed the inherent flexibility of choosing a LEDPA that assumes the Oregon Inlet bridge is built now and decisions made on NC 12 later. The approach of choosing the Phased Approach/Rodanthe Bridge Alternative (Preferred) now and, if needed, revising it later offers similar flexibility.
- The approximately 50 acres of wetland impact associated with the Road North/Bridge South Alternative was discussed.

8.10.3 Meeting of the Merger Review Board

On August 27, 2007, representatives of NCDOT, FHWA, USACE, and NCDENR identified the Phased Approach/Rodanthe Bridge Alternative (Preferred) as the LEDPA for replacing Bonner Bridge under the project's NEPA/Section 404 merger process (see Appendix D for the signed agreement). Senior representatives of these four agencies selected the LEDPA because the NEPA/Section 404 Merger Team could not reach a consensus on a LEDPA. Agency representatives based their decision on each alternatives' ability to meet the project's purpose and need, environmental consequences, opportunities available to mitigate impacts, cost, public and agency comment on the findings of the SDEIS and SSDEIS, and other findings presented in this FEIS. Agency representatives concurred that the Pamlico Sound Bridge Corridor is not a practicable alternative because of the high cost estimates, and therefore is not the LEDPA. The LEDPA has been adopted as the Preferred Alternative. See Section 2.15 for a discussion of specific findings of these agency representatives.

8.11 Section 7 Consultation

The FHWA consulted with the USFWS and the NMFS under Section 7 of the Endangered Species Act of 1973 to address potential impacts to threatened and endangered species. In the case of the USFWS, this consultation marked the re-initiation of formal consultation that began in 1997 follow the release of the 1993 DEIS.

Formal consultation with the USFWS for the Preferred Alternative identified in this FEIS included:

- December 17, 2007—FHWA and NCDOT met with USFWS to discuss preparation of a Biological Assessment.
- March 6, 2008—FHWA requested formal consultation in a letter (See Appendix A). Also included was FHWA's Biological Assessment.
- March 13, 2008—USFWS sent a letter to FHWA stating that all information required for initiation of consultation was either included with FHWA's March 6, 2008 letter or was otherwise available (See Appendix A).
- April 8, 2008—An addendum to the Biological Assessment was submitted to USFWS by FHWA that clarified several issues and provided revised figures.
- June 4, 2008—USFWS provided the FHWA and NCDOT with a draft Biological and Conference Opinions document.

- June 11, 2008—FHWA and NCDOT met with USFWS to discuss the draft Biological and Conference Opinions document and reasonable and prudent measures.
- July 9, 2008—USFWS met with FHWA and NCDOT to discuss the draft reasonable and prudent measures.
- July 10, 2008—USFWS provided FHWA with their *Biological and Conference Opinions* (USFWS, 2008) document (see Appendix E).

Consultation with the NMFS for the Preferred Alternative identified in this FEIS included:

- March 6, 2008—FHWA requested formal consultation in a letter (See Appendix A). Also included was FHWA's Biological Assessment.
- April 28, 2008—NMFS asked FHWA seven questions related to the Biological Assessment.
- May 30, 2008—FHWA provided responses to the seven questions and relevant pages of the SDEIS and SSDEIS related to the questions.
- August 4, 2008—NMFS provided a letter agreeing with NCDOT's conclusion that the Preferred Alternative may affect but is not likely to adversely affect protected species within their jurisdiction (see Appendix A).

8.12 Comments Received on SDEIS and SSDEIS and Responses

8.12.1 Public Comments and Responses

This section presents the comments on the SDEIS and the SSDEIS submitted by the public, interest groups, and businesses. These comments come from oral testimony, comment forms, and letters. The comments primarily included expressions of support or opposition to specific alternatives, expressions of opinion on the positive and negative aspects of a particular alternative or alternatives, thoughts on the ability of alternatives to satisfy future traffic need, and suggestions for additional alternatives. One hundred and fifty total written and oral comments were received during the November 9 and 10, 2005 public hearings. One hundred and forty six total written and oral comments were received during the March 28 and 29, 2007 public hearings.

8.12.1.1 Pamlico Sound Bridge Corridor Comments

There were 41 comments that expressed support for the Pamlico Sound Bridge Corridor at the November 9 and 10, 2005 public hearings. Included in this total were three comments that specifically supported the Pamlico Sound Bridge Corridor Curved Rodanthe Terminus and two comments that supported the Pamlico Sound Bridge Intersection Rodanthe Terminus. There were 42 comments that supported the Pamlico Sound Bridge Corridor at the March 28 and 29, 2007 public hearings. Included in this total were 15 comments that specifically supported no preference for the Pamlico Sound Bridge Corridor and 25 comments that supported the Pamlico Sound Bridge with Intersection Rodanthe Terminus.

Comments Against the Pamlico Sound Bridge Corridor Alternative

Comments: Those opposed to the Pamlico Sound Bridge Corridor gave the following reasons:

- Loss of public access to the Refuge (addressed in Section 4.5.3.1 of the SDEIS and the FEIS);
- Adverse impacts to Oregon Inlet navigation would occur because the groin would be removed (addressed in Sections 3.6.2.3 and 4.6.3 of the SDEIS and Sections 3.6.3.5 and 4.6.3 of the FEIS);
- The corridor is too expensive, primarily in contrast to the Oregon Inlet bridge component of the Parallel Bridge Corridor (addressed in Section 2.12 of the SSDEIS and the FEIS);
- Adverse impacts on the economy, primarily from non-road access to the Refuge (addressed in Section 4.1.5.3 of the SDEIS and the FEIS);
- Adverse impact to the environment (addressed throughout Chapter 4 of the SDEIS and the FEIS); and
- The bridge could be closed by high winds particularly during hurricane evacuation (a discussion of bridge safety, including the potential for bridge closure is included in the FEIS in Section 2.8).

Response: *These positions are acknowledged. The sections in the SDEIS and the FEIS where these concerns are addressed are noted above.*

Comments in Support of the Pamlico Sound Bridge Corridor Alternative

Comments: Those that supported the Pamlico Sound Bridge Corridor gave the following reasons:

- Best option for long-term dependable/safe access to Hatteras Island because it would move NC 12 off Hatteras Island where NC 12 is subject to closure during storm events;
- Provides dependable hurricane evacuation that would reduce time needed to evacuate people (i.e., allow tourists to stay longer);
- Preserves character/natural environment/wildlife of the Refuge and allows for the natural erosion of the shoreline;
- More cost-effective over the long-term because it would move the road away from an ever-changing Hatteras Island;
- Would be a tourist attraction;
- Use of the Refuge is seasonal, so the impact on the economy of losing Refuge access would not be that severe, most tourists go to areas north of Refuge for most of the year; and
- Would reduce future unknowns—once it is built, it is done (e.g., funding, nourishment, interaction with USFWS, etc.).

While favoring the Pamlico Sound Bridge Corridor, some were concerned about the loss of land in Rodanthe to accommodate the southern terminus of the bridge. It is believed that many supporters of the Pamlico Sound Bridge also are concerned about access to the Refuge and keeping the groin to protect navigation of the channel.

Response: *These positions are acknowledged. All of the alternatives were developed to provide long-term dependable/safe access to and evacuation from Hatteras Island. The difference between the Pamlico Sound Bridge Corridor bridge, Parallel Bridge Corridor with All Bridge, and Parallel Bridge Corridor with Phased Approach and the remaining alternatives is that these would bridge potential storm-related island breach locations, thereby avoiding potential damage from overwash. Impacts to the character/natural environment/wildlife in the Refuge were addressed in Sections 4.3, 4.5.2, and 4.7 of the SDEIS and the FEIS. Costs over the life of each alternative were presented in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS. Economic impacts to tourism are addressed in Section 4.1.5 of the SDEIS and the FEIS.*

8.12.1.2 Parallel Bridge Corridor Comments

Seventy-three comments were received that expressed support for the Parallel Bridge Corridor in general during the March 28 and 29, 2007 public hearings. Forty comments supported the Parallel Bridge Corridor with no preference, while 21 comments supported the Parallel Bridge with Nourishment.

Ninety-four comments were received that expressed support for the Parallel Bridge Corridor in general during the November 9 and 10, 2005 public hearings. Six comments supported the Parallel Bridge Corridor with Nourishment, while 81 comments were non-specific to which corridor they supported.

Comments Against the Parallel Bridge Corridor Alternative

Comment: Several comments stated the long-term beach erosion/migration within the Refuge will continue and that there is potential for a breach to occur in the Refuge.

Response: *This position is acknowledged. Shoreline erosion is a natural process and considered desirable by Refuge officials and preferable to artificially maintaining the shoreline, despite its threat to Refuge access and facilities (see Section 5.2.2.4 of the SDEIS and Section 4.5.3 of the FEIS). The Pamlico Sound Bridge Corridor bridge, Parallel Bridge Corridor with All Bridge, and Parallel Bridge Corridor with Phased Approach would bridge potential storm-related island breach locations. The Preferred Alternative, when complete, would both allow natural erosion of Hatteras Island in the Refuge to occur and bridge potential breach locations.*

Comment: Several comments were made expressing concern that continuing to maintain NC 12 through the Refuge will be too expensive and environmentally damaging.

Response: *This position is acknowledged. Costs over the life of each alternative were presented in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS. All of the alternatives were developed so as to minimize long-term maintenance to NC 12. The Phased Approach/Rodanthe Bridge Alternative (Preferred) would necessitate maintenance of existing the NC 12 roadway until each phase is completed; the timing of the NC 12 phases was developed so that the sections requiring the most regular*

maintenance (because of their proximity to the ocean) would be constructed first. An assessment of the potential natural resource impacts of that maintenance is included in Section 4.7 of the FEIS. It is tied to a monitoring program and process for deciding when to implement each phase as the shoreline evolves presented in Section 2.10.2.5 of the FEIS. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.

Comments in Support of the Parallel Bridge Corridor Alternative

Comments: Those that supported the Parallel Bridge Corridor gave the following reasons:

- Maintains current location of navigation channel and inlet by retaining the terminal groin (addressed in Section 4.6.3 of the SDEIS and the FEIS);
- Maintains Refuge access, with a paved road; loss of access to Refuge beaches with the Pamlico Sound Bridge Corridor will put strain on other beaches on Hatteras Island (e.g., overcrowding, too many vehicles) (addressed in Sections 4.5.1 and 4.5.3 of the SDEIS and the FEIS);
- Practical, expedient, economical in that it spreads the costs out over a longer period of time than the Pamlico Sound Bridge, which would need to be built all at once (addressed in Section 2.12 of the FEIS);
- Less cost impact on power supply to Hatteras Island, i.e., it would be very expensive to relocate the power supply on or parallel to a Pamlico Sound Bridge (addressed in Section 4.1.6.10 of the SDEIS and the FEIS; power supply costs are reflected in Section 2.3.3 of the SSDEIS and Section 2.12.3 of the FEIS);
- Time is getting short, construction of the new bridge needs to start soon; safety of existing bridge and keeping NC 12 open until project finished is a concern. Funds for that are needed, too;
- NC 12 has been in the Refuge for a long time, yet the Refuge has still appeared to thrive; and
- Some people have a fear of crossing long bridges (see Section 2.8 for the findings of a long bridge safety study conducted in response to SDEIS comment).

Reasons for supporting the Parallel Bridge Corridor with Nourishment Alternative included:

- Nourishment would preserve what tourists come to Hatteras Island for; other alternatives are unknowns in terms of economic impacts (addressed in Section 4.1.5 of the SDEIS).
- Opposition to any alternatives that would adversely impact Mirlo Beach subdivision at the north end of Rodanthe (addressed in Sections 4.1.4 and 4.3.1 of the SDEIS, SSDEIS, and FEIS). Support Nourishment Alternative to maintain community; it is only alternative with no impact on people and their properties;

A letter of support for the Phased Approach/Rodanthe Bridge Alternative (Preferred) indicated that it is the only reasonable and feasible alternative which provides necessary transportation linkage to Hatteras Island; it provides the least overall environmental damage to the Seashore and the Pamlico Sound Outstanding Resource Waters; and it protects public health and safety while

ensuring good stewardship of limited fiscal resources. Regarding the Road North/Bridge South Alternative, one commenter said it is the best alternative and nourishment money could be spent elsewhere.

Response: *These positions are acknowledged. The locations in the SDEIS and FEIS where these concerns are addressed are noted above as applicable. The Phased Approach/Rodanthe Bridge Alternative (Preferred), however, while achieving most of the objectives expressed in these comments, would only leave two access points within the Refuge, adversely affect the Mirlo Beach subdivision, and would result in approximately 13 miles (20.9 kilometers) of bridging.*

8.12.1.3 No Corridor Preference

Fifteen comments were received that expressed support for no specific corridor in general during the November 9 and 10, 2005 public hearings. Thirty-one comments stated no preference for a specific corridor during the March 28 and 29, 2007 public hearings. Some did identify concerns about project characteristics, which are included in the other comments discussed in the next section.

8.12.1.4 Other Comments

Comment: Pamlico Sound Bridge does not require a USFWS compatibility determination.

Response: *This is true because this alternative is not within the boundaries of the Refuge.*

Comment: Nourishment is the only alternative that would hold up in court since there is precedence for the maintenance of NC 12; also, it does not impact any properties in Rodanthe.

Response: *As noted in Section 5.1.2.2 of the SDEIS and Section 4.5.2 of this FEIS, under the National Wildlife Refuge System Improvement Act of 1997, proposed uses of refuges must be evaluated for compatibility with refuge goals, objectives, and the refuge's establishing legislation. Such a Compatibility Determination would be required with the Nourishment Alternative because the sand would be placed within the Refuge and outside of the existing NC 12 easement.*

Comment: A primary concern is the safe navigation through Oregon Inlet; the need to make the inlet safer and protect the inlet, including building a groin on northern side of inlet. The livelihoods of Oregon Inlet users are a concern. Keep the groin in place no matter which alternative is selected.

Response: *The positions are acknowledged. Discussions related to the impact of the alternatives on Oregon Inlet users are contained in Section 4.1.7 of the SDEIS and this FEIS. NCDOT recognizes that it would need to re-apply for the terminal groin permit to construct the Oregon Inlet component of the Phased Approach/Rodanthe Bridge Alternative (Preferred).*

Comment: Cost and impact of various alternatives on Cape Hatteras Electric Cooperative must be considered (Pamlico Sound Bridge Corridor would have substantial impacts).

Response: *This factor is addressed in Section 2.3 of the SSDEIS, Section 4.1.6 of the SDEIS, and Sections 2.12 and 4.5.4 of this FEIS.*

Comment: Selected alternative should accommodate bicycles.

Response: *See Section 2.8.2 of the SDEIS and Section 2.10.2 of the FEIS for discussions of bicycle accommodations. The 8-foot (2.4-meter) wide shoulders on the proposed bridges would be safer for use by bicycle and pedestrian traffic than Bonner Bridge's existing 2-foot (0.6-meter) wide shoulders. In addition, the planned bicycle-safe bridge rail on the proposed bridges would also provide increased safety for bicyclists.*

Comment: Build four-lane Pamlico Sound Bridge to address safety and congestion.

Response: *See Section 2.8.3 of this FEIS for a discussion of provisions for safe bridge operations.*

Comment: Icing on a Pamlico Sound Bridge is a concern.

Response: *As part of a study of the safety features on long bridges, NCDOT noted actions that could be taken to mitigate for icy conditions. See Section 2.8 of the FEIS for a discussion of provisions for safe bridge operations.*

Comment: Unless NCDOT abandons its right-of-way in the Refuge, the cost of ongoing maintenance of NC 12 should be included in Pamlico Sound Bridge Corridor costs. Also, USFWS cost for continued public access and environmental impacts of access should be included.

Response: *The costs of providing alternative access to the Refuge are presented in Section 2.3.3 of the SSDEIS and Section 2.12.3 of the FEIS. NCDOT examined these costs as part of an overall public cost estimate. The impacts of the provision of alternate access to the Refuge are not addressed in this FEIS because the USFWS has not developed any specific program of alternate access. It is presumed that any such program developed by the USFWS would be compatible with the Refuge under the National Wildlife Refuge System Improvement Act of 1997.*

Comment: Planning timeframe for the replacement bridge project is unclear in the SDEIS (i.e., is the design life 50 years or 100 years?).

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years. However, some bridge structure components of the alternatives could potentially last longer than 50 years.*

Comment: Keep part of old bridge for recreational uses, i.e., fishing. Fishing catwalks should be built on the new bridge, whichever bridge is built.

Response: *See the associated discussion in Section 2.10.1.2 of the FEIS. It is impossible to leave a portion of Bonner Bridge for fishing with the Preferred Alternative; the part of Bonner Bridge with the catwalks has to be demolished to make room for the new bridge. One viable approach to provide new fishing access appears to be leaving a portion of a traffic maintenance bridge in place after the new bridge is complete. A "boardwalk" under and around the new bridge also is a possible option. This fishing facility would be on top of the riprap that currently blankets the northern shore of Hatteras Island. The viability of catwalks also will be considered. NCDOT recognizes the importance of providing continued recreational access to Oregon Inlet.*

Comment: Use demolished bridge as part of artificial reef (for fish) near Oregon Inlet.

Response: *See the associated discussion in Section 2.9 of the SDEIS and Section 2.11 of the FEIS. Coordination also would be conducted with the NMFS in association with their regulation of several protected species.*

Comment: Use Bonner Bridge as a reef to help control erosion when it is torn down.

Response: *The Coastal Resources Commission regulations generally prohibit the use of hardened structures, such as metal sheet piling, to protect houses, roads and other oceanfront construction from erosion (NC Division of Coastal Management website).*

Comment: Let nature take its course.

Response: *The Preferred Alternative, once complete, would allow for natural movement of the shoreline (see Section 4.6.5 of the FEIS).*

Comment: Oregon Inlet bridge provides better back-up access to Hatteras Island (i.e., with a maintained road on both sides of Oregon Inlet, it would be easier to provide emergency access to island if the bridge were ever out for some reason).

Response: *NCDOT's emergency ferry terminal is located in Rodanthe, so the emergency route would not be impacted by the selection of the Preferred Alternative.*

Comment: Parallel Bridge Corridor would leave residents to still deal with horrible road conditions through Refuge in bad weather.

Response: *All alternatives, including the Preferred Alternative, include a long term solution to current and projected overwash problems on NC 12 between Rodanthe and the south end of Bodie Island.*

Comment: Opinions differ on which corridor is safer for evacuation. Road blocking accidents are a concern with the Pamlico Sound Bridge.

Response: *All of the alternatives under consideration would allow for safe evacuation during a storm. Because of concerns regarding the safety of long bridges, a discussion of bridge safety, including the effects of weather, is included in Section 2.8 of the FEIS.*

Comment: Whichever alternative is chosen must maintain access to the entire Refuge.

Response: *All the Parallel Bridge Corridor alternatives (including the Preferred Alternative) would maintain some type of access to portions of the Refuge. With the alternatives that involve bridges as a means for maintaining NC 12, the extent of access would be determined by Refuge officials. The Pamlico Sound Bridge Corridor does not include access to the Refuge.*

Comment: The Pamlico Sound Bridge and the Rodanthe bypass bridge associated with the Road North/Bridge South Alternative could have a negative impact on recreation in Pamlico Sound.

Response: *This concern is discussed in Section 4.5.4 of the SDEIS and the FEIS.*

Comment: Resume ferry service (one person said that all bridges are unrealistic and doomed to failure, expenses are excessive, and ferry does not interfere with the environment).

Response: *Ferry service would not provide a capacity to serve current and future travel demand and therefore would not meet the purpose of the project (see Section 2.2.6 of the SDEIS and the FEIS).*

Comment: Discounting should be shown in all materials presented to the public or costs are misleading (especially for the Nourishment Alternative, whose cost drops the most when discounted).

Response: *This position is acknowledged. Discounted costs are included in Section 2.3.1 of the SSDEIS and Section 2.12 of the FEIS.*

Comment: Nags Head is currently not getting funding for beach nourishment, so how would NCDOT pay for nourishment?

Response: *Tax dollars collected specifically for highway related projects would pay for nourishment if an alternative involving nourishment were implemented. These funds are separate from those used for beach nourishment projects.*

Comment: It is reasonable to assume that beach nourishment will continue no matter which alternative is selected because of pressure from various groups.

Response: *Once the Phased Approach/Rodanthe Bridge Alternative (Preferred) is completed, NC 12 would be placed on a bridge for most of its length in the project area. Nourishment would not be needed to keep NC 12 open.*

8.12.1.5 Other Expressions of Preference and Opinion

The following additional preferences and opinions were expressed by the public. The positions of those commenters are acknowledged.

- Build the bridge now.
- Extend the Pamlico Sound Bridge (possibly as a toll road) to bypass Rodanthe, Waves, and Salvo, or just go with the Oregon Inlet bridge and improve NC 12.
- If Bonner Bridge is closed before it is replaced, the economic impact on Dare County would be substantial, as would the economic impact on the State. Dare County is a donor county (it generates more state tax revenue than it receives in state tax expenditures).
- Parallel Bridge Corridor supporters love the Refuge.
- Wildlife will adapt to elevated road in Refuge.
- Human interests should take precedence over wildlife.
- All necessary measures need to be taken to save Hatteras Island from erosion (levies, beach nourishment, etc.); place human environment concerns ahead of the natural environment.

- In 2003, over 700 petitions from the Pea Island Coalition were gathered in opposition to the Pamlico Sound Bridge. However, some commenters felt that petitions from non-residents of Hatteras Island favoring the Parallel Bridge Corridor should not carry any weight in the decision.
- Politicians that are for the Parallel Bridge Corridor do not have to be inconvenienced by road problems in the Refuge. Also, many people in the tourism industry that are for the Parallel Bridge Corridor do not live on Hatteras Island.
- The real estate community seems to be firmly behind the Parallel Bridge Corridor.

8.12.2 Government Agency Comments and Responses

This section responds to written comments on the SDEIS and the SSDEIS submitted by state and federal environmental resource and regulatory agencies as well as local governments and commissions. Each substantive comment requiring a response is listed below, followed by a response. The comments in the sections quote the correspondence received. The original correspondence is presented in Appendix A. The page number of each letter in Appendix A is included in the subheadings listing each letter.

8.12.2.1 Federal

United States Department of the Army Wilmington District, Corps of Engineers-December 14, 2005 (page A-4)

Comment: “Page 2-2, Section 2.1, No-Action Alternative. The SDEIS states that “a new small-scale ferry service from Bodie Island to Hatteras Island would be developed if, following public review of the document, this alternative were selected as the preferred alternative.” It states “nine-hundred vehicles per day on a ferry is far less than the existing demand and the expected 2025 demand presented in Table 1-2 of Chapter 1, which shows an average annual daily traffic of 9,600 vehicles per day and peak traffic of 25,200 vehicles per day in 2025. While we agree that demand will exceed the capacity of a ferry service, we disagree with the statement that the “No-Action Alternative would not meet the project’s purpose and need.” The stated purpose and need for the project does not talk about capacity. If the “No-Action Alternative” includes the use of a ferry after the Bonner Bridge is demolished, then the statement that the alternative would not meet the project’s purpose and need should be deleted.”

Response: *The need for access across Oregon Inlet, reliance of the permanent Hatteras Island population on mainland goods and services, Hatteras Island and Ocracoke Island emergency evacuation requirements, and travel demand are all addressed in the Statement of Purpose and Need (see Chapter 1 of this FEIS) approved by the NEPA/Section 404 Merger Team. The NCDOT is required to provide access with sufficient capacity if it is to meet the continued demand for convenient daily and emergency access across Oregon Inlet.*

Comment: “Page 2-82, Section 2.7.2 and Page 4-110, Section 4.13.6, Bridge Characteristics and Natural Resource Protection. The SDEIS states that piles for the bridge substructure would be jettied into place and/or in some cases driven. The SDEIS needs to address more thoroughly in section 4.13.6, the environmental impacts associated with jetting and the measures that will be taken to minimize and reduce these impacts.”

Response: *Jetting characteristics are addressed further in Section 2.10.1.3 of the FEIS, including means for minimizing the distribution of material displaced by dredging where appropriate. The impacts of jetting are noted as appropriate in Sections 4.7.2, 4.7.4, and 4.7.6.*

Comment: “Page 2-108, Section 2.9, Demolition and Removal of Bonner Bridge. While the SDEIS addresses the demolition and removal of the Bonner Bridge for whatever alternative is selected, we didn’t find information relating to the removal and disposal of NC 12 if the Pamlico Sound Bridge Corridor is selected and the Pea Island Wildlife Refuge requests the removal of NC 12.”

Response: *Removing and disposing of current and temporary NC 12 pavement in association with implementation of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is addressed in Section 2.11.2 of the FEIS.*

Comment: “Page 3-38, Section 3.6.2.2, Potential Breach Locations. The SDEIS states “if a breach were to occur it would likely close eventually (although not necessarily immediately) and would likely not become a long-term phenomenon like Oregon Inlet.” Was that determination part of the study or was it a prediction made by some other party?”

Response: *The determination was made by the expert panel described in the referenced section, which is also included in this FEIS.*

Comment: “Page 3-30, Section 3.6.2.3, Oregon Inlet Movement through 2085 (Terminal Groin). The SDEIS states “the NCDOT has no current plans to remove the terminal groin on Hatteras Island after Bonner Bridge is demolished.” Other previous correspondence between the Service and NCDOT state “the right-of-way permit for the terminal groin may be terminated by the Regional Director for failure to comply with any or all terms and conditions of the grant, or for abandonment.” Once the Bonner Bridge is demolished, by conditions contained in the permit, it appears the terminal groin would be required to be removed because of abandonment. The SDEIS states, “If a bridge were built in the Pamlico Sound Bridge Corridor, the terminal groin could serve parties other than the NCDOT and other immediate needs besides protecting Bonner Bridge or its replacement. It is conceivable, however, that circumstances could change at some time in the future, and it could prove prudent to remove the terminal groin if the Pamlico Sound Bridge Corridor is used for the replacement bridge.” Clarification of this issue should be coordinated between the Service and NCDOT and contained in the document. In other locations (i.e. Section 4.6.3, Performance of the Terminal Groin) in the document discussions of the terminal groin are ambiguous.”

Response: *The Parallel Bridge Corridor alternatives (including the Preferred Alternative) require the continued presence of the terminal groin in order to protect the southern terminus of the Oregon Inlet crossing; the Pamlico Sound Bridge Corridor Alternatives do not require the terminal groin. Other parties were also interested in keeping the groin because of the perceived benefits to Oregon Inlet navigation.*

Comment: “Page 4-23, Section 4.1.7, Oregon Inlet Users. The SDEIS states that the use of “the crack” navigation channel shortens the distance traveled by vessels operating between the fishing center and the Bonner Bridge navigation span from approximately 5 miles to about 2.5 miles but that the travel time would be increased by approximately 30 minutes. Please clarify why the additional time is so long. A boat traveling at 10 mph could travel a distance of 2.5 miles in 15 minutes and from personal observations it appears most boats traveling between the fishing center and Oregon Inlet typically run faster than 10 mph.”

Response: *According to management with the Oregon Inlet Marina, the distance from that facility to Bonner Bridge is approximately 2.5 miles (4.0 kilometers) using the crack channel and 5 miles (8.0 kilometers) using USACE maintained channels (Old House Channel and Oregon Inlet Channel). Though charter boats traveling from the Marina can travel up to 18-25 mph, the boats cannot always travel at full speeds for parts of the trip. The staff interviewed stated it would take an estimated 15 minutes to travel the 2.5-mile (4.0-kilometer) distance of the crack channel and an extra 30 minutes to travel via the USACE channels.*

Comment: “Page 4-79, Section 4.7.8.3, Compensatory Mitigation. The SDEIS states “if temporary impacts to wetlands were to occur, such impacts would be mitigated on a 1:1 basis by restoring these areas to their pre-construction condition.” Until these impacts can be more thoroughly assessed we are unable to agree that a 1:1 ratio for temporary impacts is appropriate. Factors such as compaction sometimes limit how these areas can be restored. Mitigation ratios for temporary impacts will be assessed during the permit process.”

Response: *The commenter’s position is acknowledged, and this issue will be revisited during the Section 404 permitting process.*

Comment: “Page 4-7, Section 4.1.2.4, Pea Island National Wildlife Refuge Master Plan. As you are aware, a major factor in determining the range of alternatives which can be considered in the selection of the LEDPA for this project are dependent on a Compatibility Determination being reviewed by the USFWS under the provisions of the National Wildlife Refuge System Improvement Act of 1997. The SDEIS states, “The USFWS compatibility determination will be presented in the Final Environmental Impact Statement (FEIS).” Potential delays in obtaining a decision concerning compatibility may lead to delays in the project.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined to the existing NC 12 easement authorized by USFWS. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement. The operation of the Phased Approach is consistent with the purpose of the permanent easement; therefore, a compatibility determination is not required for the Preferred Alternative.*

Comment: “Section 2.7.5.1, Construction Procedures. Construction related impacts due to dredging of the Pamlico Sound for barge access is a permanent impact that must be adequately described in the SDEIS. This description should include impacts to SAV, shellfish, benthic communities, fisheries resources, and should provide information concerning proposed disposal area(s) and method of excavation.”

Response: *The construction-related natural resource impacts are discussed in Sections 4.7 and 4.13 of the SDEIS and the FEIS. Additional natural resource impact discussions related to the topics listed in the comment have been added in response to SDEIS and SSDEIS comments.*

United States Department of the Army Wilmington District, Corps of Engineers-April 17, 2007 (page A-6)

Comment: “Page 2-18, Section 2.3.1.2, Changes in Bridge Cost Assumptions Since the SDEIS. Further more in-depth documentation is needed as to why the original cost estimates were so grossly underestimated in the original document. The paragraph describes some

justification (project delivery method, inflation) as to the rise in costs but the estimated cost of construction per square meter rose 57 to 73 percent. Why does the replacement bridge construction cost (single line item in cost charts) go up 36 percent (191,000,000 to 260,000,000) for the parallel bridge and 123 percent (416,800,000 to 933,500,000) for the Pamlico Sound Bridge?”

Response: *Section 2.3.1.2 of the SSDEIS and Section 2.12.1.2 of this FEIS summarize in full the changes to the cost assumptions made between the SDEIS and the SSDEIS. The new costs prepared by NCDOT were verified by both an independent consultant with bridge construction experience and the FHWA. In the context of the selection of the LEDPA, members of the NEPA/Section 404 Merger Team, including those of the USACE, were provided notebooks containing all the cost estimates and their underlying assumptions. NCDOT staff discussed the cost estimates with the Merger Team in June 2007 (see Section 8.10.1), and the members indicated that their questions related to the cost estimates were satisfactorily resolved.*

Comment: “Page 2-19, Section 2.3.1-3, **Cost Comparison**. Further information/data/analysis to be presented pertaining to the projected life-spans of the two bridge corridors and their relative costs projected over time to reflect the true costs of the projects (i.e. if the sound bridge provides service for 100 years at a cost of 1.3 billion vs. a 50 year service life parallel bridge with NC 12 maintenance at a cost of 900 million, which one would be more practicable to construct?). The SDEIS states on page xxiii the expected full Life of the Pamlico Sound Bridge to be as much as 100 years.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years. However, the bridge structure components of the alternatives could potentially last longer than 50 years. NCDOT included revised cost estimates in the SSDEIS to show the total cost of each alternative through the year 2060. For further discussion, see Section 2.12 of the FEIS.*

Comment: “Page ix, **Other Alternatives Considered, East Bridge Corridor**. The 1991 feasibility study recommended that an East Bridge Corridor did not warrant detailed study because cost savings resulting from a shorter structure would be offset by costs related to the risk introduced by construction in an area of greater wave activity, by faster currents during storm surges, and by a location less protected from storms. While it is understood that the phased approach bridge construction is projected to take place before shoreline erosion creates construction situations as described above, realistically these scenarios could occur with the phased approach alternative. The phased approach alternative eventually puts a bridge structure in areas of greater wave action, in areas with faster current potential and in an area less protected from storms. The phased approach alternative puts a structure in a location that was deemed not warranted for study in the 1991 feasibility study. The concerns reflected in the study are still concerns today.”

Response: *The East Bridge Corridor was dropped because its more dynamic setting within Oregon Inlet would offset construction cost savings that might be realized by building a bridge shorter than the Parallel Bridge Corridor Alternative. Also, it would have greater natural resource impacts and have greater impacts to the Seashore on Bodie Island (see Section 2.2.8 of the SDEIS and the FEIS). Though the Phased Approach/Rodanthe Bridge Alternative (Preferred) includes bridges that would be eventually located within areas of greater wave action, this alternative can be constructed within the existing easement on dry land.*

Comment: “Page xiii and page 2-3, Section 2-1, 2006 Parallel Bridge Corridor with Phased Approach Alternatives Studies. The supplement uses the term “technically feasible” when describing the phased approach alternative. The Bonner Bridge Constructability Workshop written document uses the same term. Further explanation is needed describing what “technically feasible” means in terms of the phased approach alternative. It should be documented in the EIS that the workshop document states, “It should be emphasized that this approach, although feasible, is still quite technically challenging.”

Response: *It was determined through bridge engineering and construction engineering evaluations that the Phased Approach/Rodanthe Bridge Alternative (Preferred) is technically feasible. Technical feasibility means that design and construction of the Phased Approach physically can be performed under the constraints prescribed. Conventional construction techniques are available for heavy/highway contractors to use to build these bridges while maintaining traffic, remaining inside of the existing right-of-way, and not substantially affecting areas of SAV or wetlands, etc. The project constraints present unique complexities to the construction of the project. However, it is known that these complexities can be effectively addressed. Further explanation of construction techniques is provided in Section 2.10.2.4.*

Comment: “Page xvii and page 4-16, Section 4.5.3.1 Pea Island National Wildlife Refuge Access. A major concern expressed for the inclusion of the phased approach alternative was to continue to have access to the 10 plus miles of shoreline along the Pea Island Wildlife Refuge. While initial construction of a parallel bridge will provide for this access along NC 12 as it currently exists, future construction with this alternative will further limit access to the island. Once the phased approach is built out, only two access points will remain along the NC 12 corridor. An original constraint (Constructability Workshop document) for the phased approach was to maintain accessibility to NC 12 and all access points on NC 12. This alternative does not meet this constraint.”

Response: *While this statement is true, the only way to maintain full access to the Refuge from NC 12 would be to move NC 12 west of its current location or select the Nourishment Alternative. Moving NC 12 west would constitute a use of Section 4(f) property under the Department of Transportation Act of 1966, as amended and would likely be found incompatible with the National Wildlife Refuge System Improvement Act of 1997. It is likely that the Nourishment Alternative also would be found incompatible. The Phased Approach/Rodanthe Bridge Alternative (Preferred) does not constitute a Section 4(f) use or require compatibility as it is entirely within the existing NC 12 easement. The Phased Approach/Rodanthe Bridge Alternative (Preferred) includes access to the Refuge at the only two points where NC 12 still would be within the Refuge (rather than the ocean) in 2060.*

Comment: “Page xxiv, Section 7, Areas of Controversy. As stated in our original November 28, 2005 correspondence for the Supplemental Draft Environmental Impact Statement, a major factor in determining the alternatives which can be considered in the selection of the LEDPA for this project are dependent on a compatibility determination being approved by the USFWS under the provisions of the National Wildlife Refuge System Improvement Act of 1997. The SDEIS states, “The USFWS compatibility determination will be presented in the Final Environmental Impact Statement (FEIS).” The supplemental document is unclear whether or not a compatibility determination would be needed to construct the phased approach beyond phase 1. The supplemental document states that the Secretary of the US Department of Interior (DOI) response to US Senator Burr “indicates that DOI believes the replacement of the bridge itself could be

accomplished in a way which is compatible with the National Wildlife Refuge System Improvement Act of 1997, and other laws, if it is constructed within the same easement.” While we agree that is the position stated in the letter in regard to the replacement of the bridge itself, we are unclear if that means that DOI considers phase II, III, and IV to be compatible as well. Secretary Kempthorne stated in his July 5, 2006 letter that “we believe the replacement of the bridge itself could be accomplished in a way which is compatible with the Refuge Act, and other laws, if it is constructed within the same alignment or with minor changes to the current alignment.” Potential delays in obtaining a decision concerning compatibility may lead to delays in the project and cause the project to backtrack resulting in loss time and monies. Although we are unsure of when the compatibility determination must be made in the context of NEPA planning, it appears that it may be premature to select a LEDPA for the project until the compatibility determination has been completed.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement for which NCDOT has a permit and can utilize for maintaining NC 12. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement. A compatibility determination is not required because the Preferred Alternative falls within the terms of the easement permit.*

Comment: “Page xix, **Natural System**. The wetland impacts are incorrectly stated in numerous places in this section of the document. The numbers presented are in most cases the total fill which is occurring in Department of Army jurisdiction areas which includes open water impacts. The actual wetland impact numbers need be changed to reflect the true impacts to jurisdictional wetlands. There is a discrepancy in the document also relating to temporary wetland impacts. The last paragraph states the two phased approach alternatives would have 12.5 acres of temporary construction period wetland impacts, including 3.1 acres of CAMA wetland impact. Table 4-2 (Temporary Construction Fill and Pile Placement Impacts to Biotic Communities with the Parallel Bridge Corridor with Phased Approach Alternatives) on page 4-30 shows 5.6 acres of temporary construction wetland impacts. Table 4-4 on page 4-33 shows 7.12 acres of temporary wetland impacts. The correct temporary wetland impacts need to be included in the final document.”

Response: *The tables have been corrected and are included in Section 4.7.4 of this FEIS.*

Comment: “Page xxii and page 4-50, Section 4.12, **Indirect and Cumulative Impacts**. Further in-depth analysis needs to be presented pertaining to the indirect and cumulative impacts of the phased approach associated with this alternatives extended construction time frame. We do not agree with the statement in the supplement that States, “Because the proposed project would consist of the replacement of an existing bridge, as well as an existing road in the case of the Parallel Bridge Corridor, indirect and cumulative impacts would be minimal.”

Response: *In response to this comment, Section 4.7 of this FEIS includes an expanded discussion of the direct natural resource impacts associated with the Phased Approach/Rodanthe Bridge Alternative (Preferred) over the extended time frame of construction. NCDOT and FHWA consider these impacts first to be direct impacts (not indirect and cumulative impacts) since they are directly associated with the proposed action.*

Comment: “Because the potential for adverse impacts from long term construction and different construction techniques (replacing an on-grade road with a 30-foot high bridge over almost the entire length of the project) exist, we feel the current supplement does not adequately address indirect and cumulative impacts sufficiently.”

Response: *In response to this comment, Section 4.7 of this FEIS includes an expanded discussion of the direct natural resource impacts associated with the Phased Approach/Rodanthe Bridge Alternative (Preferred) over the extended time frame of construction. NCDOT and FHWA consider these impacts to be direct impacts (not indirect and cumulative impacts).*

Comment: “A more in-depth analysis is warranted as it relates to the purpose of the Pea Island National Wildlife Refuge and what long term construction does to the operation and purpose of the Refuge.”

Response: *Additional direct impact analysis related to the natural environment managed by the Refuge is included in Section 4.7 of the FEIS. Recreation use impacts, including those related to loss of access, are addressed in Section 4.5.3 of the SDEIS, SSDEIS, and this FEIS.*

Comment: “Page 2- 10, Section 2.2-2, **Phased Approach NC 12 Maintenance Characteristics**. The amount of sand needed for the Rodanthe Nourishment Alternative is estimated at 2.3 million cubic yards beginning in 2007 and 1.5 million cubic yards every four years throughout the life of the project (through 2060). Available and suitable sand sources should be identified for the life of the project and options available if future sand sources aren’t readily available should be provided.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Page 2-12, Section 2.2.2.1 **Design Features**. Additional costs could be realized for the phased approach alternatives based on structural design assumptions recommended by the AASHTO/FHWA Joint Wave Task Force. It would be beneficial prior to the selection of the LEDPA for this project to have accurate cost estimates for each alternative based on the most current design standards. It is a concern that costs could increase substantially for the phased approach if recommendations from the task force require design standards to be upgraded for bridges constructed in high energy areas such as the Atlantic Ocean. While we realize there is discussion in the cost and funding section (Section 2.3) of the supplement which addresses this issue, cost is a major concern with this project and a factor in the selection of the LEDPA and the best available information needs to be available prior to this decision point.”

Response: *The costs for all alternatives were revised for the SSDEIS based on the best available information at that time. They remain the most accurate known reflection of potential costs of the alternatives and are presented again in this FEIS.*

Comment: “Page 2- 16, Table 2-1 and 2-2, **Highway Cost to 2060 (High and Low)**. Right-of-way costs for Phased Approach/Rodanthe Bridge and Rodanthe Nourishment appear to be switched. Higher right-of-way costs should be realized for the bridge alternatives since more property would be purchased. The chart has right-of-way costs higher for the nourishment alternative.

Response: *This information was corrected in the FEIS (see Tables 2-9 and 2-10).*

Comment: Page 2-24, Section 23.4, **Capitol Funding**. Can it be assumed by this section that all the alternatives currently being studied could be funded and constructed if selected?”

Response: *No; further information developed by NCDOT after the release of the SSDEIS indicated that the State of North Carolina only has adequate funds to implement an alternative that could be phased.*

Comment: “Page 4-15 and 4-31, Section 4.5.2 and 4.7.4, **Pea Island National Wildlife Refuge Land Use Impacts on Hatteras Island and Wetlands and Open Water Habitat**. Jurisdictional wetland impact numbers need to be corrected.”

Response: *The wetland impact totals have been corrected in Sections 4.5.2 and 4.7.4 of the FEIS.*

Comment: “Page 4-32, Section 4.7.4, **Wetland and Open Water Habitat**. The Supplement states “because of the phased timeline of construction with the Phased Approach alternatives (including the Preferred Alternative) , wetland impacts could be less in Phases III and IV since sand movement within the Refuge could fill what are now considered wetlands in the NC 12 easement before bridge construction begins. It should be documented that wetland impacts as well as jurisdictional impacts could increase also as a result of sand movement.”

Response: *It is highly unlikely that wetland impacts, as well as jurisdictional impacts, of the Phased Approach alternatives (including the Preferred Alternative) could increase as a result of sand movement, given that sand movement over the long term is from the ocean to the sound.*

Comment: “Page 4-41, Section 4.7.8, **Avoidance Minimization, and Compensatory**. The 12.5 acres of temporary impacts to wetlands is incorrect based on the table on page 4-33. There are 12.5 acres of jurisdictional impacts with 7.12 acres of wetland impacts. It appears “Mitigation of Permanent Wetland Impacts” is incorrectly labeled. It appears that it should be labeled “Mitigation of Temporary Wetland Impacts for the Hatteras Island Temporary Traffic Maintenance Road.”

Response: *This information has been corrected in Section 4.7.10 of the FEIS.*

Comment: “Page 5-9, Section 5.2.2.3, **Facilities and Activities**. In the second paragraph you need to change the new linear man-made feature from 1 mile to 10 miles.”

Response: *This information has been corrected and is now in Section 4.5 of the FEIS.*

Comment: “Page 5-11, Section 5.2.2.5, Natural Systems. Please explain more clearly why temporary traffic management roads built within the existing NC 12 easement would affect 10.4 acres twice. The document implies that once Phase IV is ready for construction, all traffic would be removed from the bridge structures to temporary roads below the constructed bridges. How would these temporary roads be constructed if the shoreline has eroded westward of the bridges constructed in phases II and III?”

Response: *Phases III and IV would be constructed before the end points of Phases II and III (to which they have to connect) are on the beach or in the ocean.*

Comment: “It is our understanding that NCDOT is preparing to expend approximately 42 million dollars to conduct repairs to Bonner Bridge, thus extending its usable life by approximately 10 years. It is our assumption that this will have no effect on implementation of the selected alternative (LEDPA). However, if this is not the case, such changes should be identified in the final EIS.”

Response: *The repairs (TIP Project No. B-5014) will have no effect on the timing of project implementation and are being implemented so that the existing bridge can remain open until a new crossing is completed.*

US Department of Commerce-National Oceanic and Atmospheric Administration-National Marine Fisheries Service- April 17, 2007 (page A-9)

Comment: “The impact analysis provided in the SDEIS does not adequately address the significant environmental consequences of the alternatives to NOAA trust resources. The project area includes categories of essential fish habitat (EFH), which have been designated by the Regional Fishery Management Councils pursuant to the Magnuson-Stevens Act.

Response: *The Essential Fish Habitat analysis was revisited for the FEIS. Revisions are presented in this FEIS, with additional detail presented in an Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: The North Carolina barrier island system is an important resource providing valuable habitat for fish and wildlife. The 12.5-mile section of NC 12 that bisects the Pea Island National Wildlife Refuge (Pea Island Refuge) fragments the habitat and disrupts natural coastal processes. Most alternatives for the Parallel Bridge Corridor involve the periodic discharge of dredged material to control beach erosion at identified “hot spots.” Historically, this practice has led to changes in the composition of the beach sediments (such as more finer-grained sands and a greater percentage of heavy minerals within the sands) and changes in the invertebrate community that inhabits the intertidal beach.

The value of surf zone habitat and the impacts to it are not addressed nor are the impacts of dredging in offshore borrow sites for beach fill. Long-term beach nourishment would be required for the Parallel Bridge Corridor With Nourishment alternative. However, the feasibility and potential long-term impacts of dredging offshore and deposition of sand on the ocean beach within the Pea Island Refuge are not adequately addressed.

The SDEIS assumes that sand of a suitable quality and quantity will be available for beach nourishment for the 50-year life of the project. This assumption is not supported by the information provided. Both the need for and availability of suitable beach stabilization material

appears to be significantly understated and could affect conclusions about the suitability of the alternatives that have beach nourishment as a component.

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have gathered additional information on the source, availability, and suitability of sand for nourishment. Additional impact assessment on its extraction would have been conducted in light of the findings.*

Comment: The document includes an EFH assessment; however, the assessment is inadequate and does not provide a sufficient level of detail regarding impacts to EFH to allow for a detailed comparison of the alternatives.”

Response: *The Essential Fish Habitat analysis was revisited for the FEIS. Revisions are presented in this FEIS, with additional detail presented in an Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “Page 1-5, 1.1.3, Erosion of the Hatteras Island Shoreline. This section does not take into account the volume of sand, which frequently exceeds 500,000 cubic yards per year that has been placed on the beach as a result of dredging Oregon Inlet over the past 12 to 14 years and its effect on the erosion rates at the hot spots. In view of the potential impacts of beach nourishment on NOAA trust resources, we do not view beach nourishment as an acceptable long-term alternative for maintaining NC 12.”

Response: *Position acknowledged. An alternative that involves beach nourishment was not selected as the Preferred Alternative.*

Comment: “Page 2-67, 2.6.3.2, Design Assumptions. The discussion assumes that all sand is biologically suitable for beach nourishment. This is not the case. Maintenance of important invertebrate communities in the surf zone that support NOAA trust resources is an essential component of any beach nourishment project. Compatibility of the borrow sands with those at the natural beach is a key issue and is insufficiently addressed. This section assumes that suitable sand will be available through the year 2060. This may not be the case since sand dynamics within the proposed borrow areas could change and affect their suitability for beach nourishment. If the availability of compatible sand cannot be assured for the life of the project, it could present a major obstacle to implementing the alternatives that involve beach nourishment.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Pages 2-104, 2.8.2.1, Nourishment. The SDEIS states that beach nourishment would occur in four locations and likely be repeated at four-year intervals. The volume of sand needed appears to substantially underestimate what would be needed for beach and dune construction. Over 500,000 cubic yards of sand from Oregon Inlet have been deposited along and adjacent to the “Canal Zone Hot Spot” annually for the past four years, and it has not been sufficient to protect the highway from overwash. The estimated volumes of material needed for beach stabilization for those alternatives involving beach nourishment appear to be understated.”

Response: *An alternative that involves beach nourishment was not selected as the Preferred Alternative. Past deposition of sand from Oregon Inlet was not done as a part of a systematic program to maintain the shoreline. The sand quantities presented for the alternatives involving nourishment reflect such a program.*

Comment: “Page 2-70, Sand Requirements. Sand availability is not adequately described. Throughout the document when sand availability is discussed, little information is provided regarding its suitability for beach nourishment and the standard used to determine suitability for beach placement are not clear.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Pages 2-80, Bridge Characteristics and 2-96, 2.8.1.2 Design Characteristic. These sections are inconsistent when describing the shoulder requirement for the two bridge corridors. The Parallel Bridge Corridor has a shoulder width of 6 feet while the Pamlico Sound Bridge Corridor has a shoulder width of 8 feet. Wider shoulders on the longer bridge increase the cost versus more narrow shoulders on the short bridge. Since this scenario provides for an unequal cost comparison, the difference should be explained.”

Response: *Six-foot (1.8-meter) shoulders were used in the 1999 final design for the Oregon Inlet bridge in the Parallel Bridge Corridor. The cost estimates included in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS assumed 8-foot (2.4-meter) shoulder widths for all bridges for the replacement bridge corridor alternatives. The final design for the Phased Approach/Rodanthe Bridge Alternative (Preferred) includes 8-foot (2.4-meter) shoulders for all bridges.*

Comment: “Page 4-45, Section 4.7 through Page 4-95, Section 4.12. These sections provide an inadequate analysis of actual impacts to fishery resources. Although beach nourishment is a significant component of several alternatives, there is limited analysis of long-term impacts to the beach invertebrate community or the fishery species that utilize the invertebrates as prey. Also, no specific information is provided concerning offshore borrow sites or the potential impacts of the removal of sand for beach fill.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative.*

Comment: “Pages 4-96, Indirect and Cumulative Impact. The SDEIS states that the indirect and cumulative effects of the Parallel Bridge Corridor would be minimal. Information provided in the SDEIS does not support this conclusion. For example, the Parallel Bridge Corridor With Nourishment alternative would result in potential cumulative impacts at offshore borrow sites. The document indicates that beach nourishment will occur every four years; however, frequent storms could result in an increased frequency of beach erosion, resulting in potential cumulative impacts to surf zone invertebrate communities and benthic communities at offshore borrow sites. Therefore, alternatives that involve beach nourishment could have substantially greater adverse impacts to EFH and associated fishery resources than alternatives that do not require beach nourishment.

The document does not provide an adequate comparison of the cumulative adverse effects of the Pamlico Sound Bridge Corridor versus the Parallel Bridge Corridor. The Pamlico Sound Corridor alternatives would impact submerged aquatic vegetation (SAV), a category of EFH. However, this resource can be mitigated and would likely result in less long-term impact to EFH than the Parallel Bridge Corridor With Nourishment alternative and Road North /Bridge South alternative that includes beach nourishment.

Response: *NCDOT and FHWA consider all impacts associated with the proposed action, including construction, to be direct impacts and not indirect and cumulative impacts. As such, the impacts identified by the commenter were addressed in the direct impact discussions by environmental topic.*

Comment: Selection of the Pamlico Sound Corridor with adequate mitigation would eliminate the need for beach nourishment and allow natural beach processes to occur within the Pea Island Refuge, which would benefit marine and estuarine dependent fishery resources that utilize the surf zone and nearshore habitats.

Response: *This observation was addressed in the SDEIS, SSDEIS, and FEIS.*

Comment: Also, over the 50 year life of the project, hopper dredging in offshore borrow sites could affect sea turtles, which are under the purview of the NMFS Southeast Regional Office Protected Resources Division.”

Response: *Hopper dredging was not intended with the nourishment alternatives.*

Comment: “The cumulative and/or additive effects of the “mixed and matched” approach stipulated in the SSDEIS are not adequately explained. If additional alternatives that are the result of the “mix and match” approach are proposed, the impacts to NOAA trust resources must be fully evaluated for comparison with other alternatives.”

Response: *A “mixed and matched” approach was not selected as the Preferred Alternative. The Phased Approach/Rodanthe Bridge Alternative (Preferred) was assessed in the SSDEIS and in this FEIS.*

Comment: “The Phased Approach would over time result in bridge sections in the surf zone. We believe that scour and altered energy regimes around these structures would degrade important surf zone habitat for fish and invertebrate species and alter the value as EFH for federally managed fishery resources. The SSDEIS does not recognize that this area is EFH and does not adequately address potential adverse impacts to fishery resources that use this area as habitat.”

Response: *The essential fish habitat analysis was revisited for the FEIS. Revisions are presented in this FEIS, with additional detail presented in a Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “The SSDEIS contains several references to the Outer Banks Task Force (OBTF). Because of the emphasis placed on the OBTF, the supplement should describe the OBTF and explain the role of that organization in the overall planning process.”

Response: *The OBTF and its role are described in Section 2.2.5 of the SDEIS and Section 2.3 of this FEIS.*

Comment: “There are references to the Constructability Workshop held on August 29 to 31, 2006, with regards to the Phased Approach alternatives (including the Preferred Alternative). The purpose of the workshop was to assess the feasibility of constructing the multiple bridges, roads, and other structures within the existing right-of-way. While the workshop did determine that construction of the Phased Approach bridges were technically feasible, it did not address the practicability or environmental effects of such construction.”

Response: *The purpose of the workshop was to determine only whether the Phased Approach was technically feasible. The practicability and the environmental effects of construction of the Phased Approach bridge are addressed in the SSDEIS and the FEIS.*

Comment: “During the 50-year life of the project all but 2.1 miles of surf zone could end up underneath bridge spans. The effects of this on benthic invertebrate communities and fishery resources in the surf zone are not adequately addressed.”

Response: *Documentation of the extent to which the Phased Approach (including the Preferred Alternative) bridges would be in the surf zone was added to Section 4.7.3 of the FEIS as Table 4-23. Benthic and fisheries impacts also are discussed in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “Page 2-4, Section 2.2.1, Phase I of the Phased Approach involves the construction of a parallel bridge over Oregon Inlet. NMFS is concerned that completion of Phase I could be used as justification to return to the status quo of repeatedly reacting to storm damage to NC 12. Since the Phased Approach alternatives would be built in four phases over many years, we are concerned that after the bridge over Oregon Inlet is completed, a decision could be made to not proceed with Phases II, III, and IV. The following passage from page 2-4 suggests this may be the case: “Although the Phased Approach alternatives (including the Preferred Alternative) are described and addressed in this Supplement as a phased alternative with specific locations and lengths for the phases...these details could be adjusted based on funding availability and the changing conditions within the project area...implementation of any individual phased could be accelerated or delayed.” Due to the high costs of this project, we are concerned that the Phased Approach could lead to only replacing the bridge and using beach nourishment to repair NC 12 and maintaining the dune system in the Pea Island Refuge.”

Response: *The statement quoted was made only to acknowledge that conditions would change over time and was not intended to imply NCDOT planned to not proceed with the later phases once Phase I was completed. The need to consider changing conditions prior to implementing future phases also was emphasized by the environmental resource and regulatory agencies during meetings that sought to reach concurrence on the LEDPA. A monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS.*

Comment: “Page 2-20, Potential Cost Sharing Opportunities with Beach Nourishment. The discussion in section 2.3.1.4 regarding potential cost sharing with COE for navigational dredging and beach nourishment assumes that dredged sand is available and biologically suitable. These assumptions may not be valid. Allowing sand on the beach that is not compatible would be disruptive to the ecological processes and would degrade surf zone EFH. This section also seems to assume that funding will be available to the COE to continue pipeline dredging on an annual basis. This has not been the case in the past and is not likely to be the case in the future. Also, due to differences in hydraulic sorting that occurs in different segments of Oregon Inlet, the sand

from certain reaches of the Oregon Inlet navigation channel is not likely to be compatible for placement on the beaches at the Pea Island Refuge.”

Response: *This section noted a potential opportunity and not a firm intent. As stated, the use of sand from ocean bar dredging was assumed for nourishment, not sand dredged from the inlet. It was assumed that if sand dredged from the ocean bar were not biologically compatible, then it would not be used with the nourishment alternatives. Cost sharing arrangements could have made it more feasible for the USACE to continue dredging on an annual basis. It was not assumed, however, that under such an arrangement that all of the sand used in nourishment would come from that single source. The Phased Approach/Rodanthe Bridge Alternative (Preferred), however, does not include a nourishment component.*

Comment: “Page 3-63-Section 3.7.6.3, Fish and Shellfish. This section does not identify marine surf zone species that could be affected by beach nourishment alternatives under the Phased Approach.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred), does not include a nourishment component.*

Comment: “Page 3-71-Section 3.7.6.4, Benthic Communities. No information is provided on the benthic invertebrate communities (e.g., *Donax* sp. and *Emerits talpoida*) in the surf zone. This community is an important food source for fish and is at substantial risk for the Phased Approach alternative.”

Response: *Documentation of the extent to which the Phased Approach (including the Preferred Alternative) bridges would be in the surf zone was added to Section 4.7.3 of the FEIS as Table 4-23. Benthic impacts also are discussed in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “Pages 4-21 through 4-22, Offshore Coastal Processes with the Phased Approach. Section 4.6.3 does not fully address the issue of scour around bridge piles. The follow up discussion does not provide a detailed analysis of the ecological impacts of scour. With bridges that are over land and gradually transition to the ocean environment, the impacts from the Phased Approach will occur on a continuum along and across the beach through time. Impact assessment should include impacts to EFH quantity and quality over time. Additional analysis should also be conducted for maintenance and/or repair of bridge piles, to include the potential placement of revetment or other stabilizing structures adjacent to the piles, and their impacts on fish and wildlife resources.”

Response: *Documentation of the extent to which the Phased Approach bridges (including the Preferred Alternative) would be in the surf zone was added to Section 4.7.3 of the FEIS as Table 4-23. Additional material on fish habitat impacts is included in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008). New material addressing design criteria for establishing pile lengths so new revetments and stabilizing structures would not be expected is included in Section 2.10.1.2 of the FEIS.*

Comment: “Page 4-34-Section 4.6.1, Fish and Shellfish. This section does not address impacts to the invertebrate surf zone community that could be significantly altered by bridge supports in the surf zone. This community is an important food source for fish that utilize the surf zone as habitat. We disagree with the assumption that bridge supports in the surf zone will not affect

fishery resources. Relocation of fish to other areas depend upon many factors, such as species impacted, population density within the impacted area as well as adjacent habitat, and the quantity and quality (or suitability) of the adjacent habitat. It is incorrect and potentially misleading to discount impacts to fisheries by implying the affected species can simply move to adjacent habitat. The project area consists of a very narrow strand of intertidal and shallow subtidal habitat, making it unlikely that species displaced by project-related impacts would be able to easily locate suitable alternative habitat.”

Response: *Documentation of the extent to which the Phased Approach (including the Preferred Alternative) bridges would be in the surf zone was added to Section 4.7.3 of the FEIS as Table 4-23. Additional material on benthic and fisheries impacts are included in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “Page 4-34-Section 4.7.6.2, Essential Fish Habitat. Surf zone EFH would be significantly altered by the presence of bridge pilings that would likely result in an even more dynamic environment that may not support surf zone invertebrates. The eventual degradation of this important habitat along approximately 10 miles of beach should be addressed in greater detail.”

Response: *Documentation of the extent to which the Phased Approach (including the Preferred Alternative) bridges would be in the surf zone was added to Section 4.7.3 of the FEIS as Table 4-23. Additional aquatic-related impacts material is included in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008).*

Comment: “Page 4-58-Table 4-12. This table does not include any adverse impacts (dredging or filling) as a result of beach nourishment.”

Response: *Table 4-12 in the SDEIS only includes impacts to wetlands and open waters; any beach nourishment project would be designed to avoid placement of sand within wetlands. However, the Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “Page 4-63, Essential Fish Habitat. This section does not address impacts to surf zone EFH or marine water column EFH as a result of beach nourishment.”

Response: *Further discussions of Essential Fish Habitat are included in Section 4.7.6.2 of this FEIS and in a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008). The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “Page 4-64-Table 4-13. This table does not include any adverse impacts to EFH associated with beach nourishment.”

Response: *Further discussions of Essential Fish Habitat in the context of the Preferred Alternative are included in Section 4.7.6.2 of this FEIS and a new Essential Fish Habitat Assessment (CZR, Incorporated, 2008). The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “Page 4-65, Parallel Bridge Corridor with NC 12 Maintenance. This paragraph does not address any habitat impacts as a result of beach nourishment.”

Response: *Impacts of nourishment are noted in the section referenced. The Parallel Bridge Corridor with Nourishment Alternative and with Phased Approach/Rodanthe Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “4-66, Parallel Bridge Corridor with NC 12 Maintenance. See comments for page 4-65.”

Response: *Impacts of nourishment are noted in the section referenced. The Parallel Bridge Corridor with Nourishment Alternative and with Phased Approach/Rodanthe Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “NMFS is concerned that bridge replacement alternatives that require long-term beach nourishment and construction and maintenance of bridge structures in the beach zone would result in long-term adverse impacts to NOAA trust resources. In stating this, we acknowledge that alternatives that involve direct impacts to SAV are problematic. We also recognize the desire to maintain access to the northern end of Hatteras Island for recreational use. However, we believe that the Pamlico Sound Bridge Corridor alternatives best support the purpose and need for this project with the least impact to important estuarine and marine resources in the project area.”

Response: *The position is acknowledged. The reasons for selecting the Preferred Alternative are discussed in Section 2.15 of the FEIS and included in the NEPA/Section 404 Merger Agreement included in Appendix D.*

United States Department of the Interior-February 13, 2006 (page A-12)

(This letter includes the comments from the National Park Service, the US Fish and Wildlife Service, and the Pea Island National Wildlife Refuge.)

Comment: “Due to shortcomings in impact analysis, the SDEIS does not appear to accurately present or evaluate each of the alternatives. Direct, indirect and cumulative effects of this project are significant, but the SDEIS fails to accurately depict the full range of effects of each alternative.”

Response: *As explained later by the commenter in this letter, indirect and cumulative impacts they refer are those associated with proposed actions outside the project right-of-way. The NCDOT considers any impact associated with the construction and operation of the proposed action to be a direct impact. Expanded discussions of direct impact on natural resources are included in Section 4.7 of this FEIS.*

Comment: “One important omission in the SDEIS is a presentation of positive benefits to the environment and to the Refuge from removing the roadbed associated with the Pamlico Sound Bridge Corridor alternatives.”

Response: *Comment acknowledged; removing the existing roadbed is noted in Section 4.7.3.1 of the FEIS for the Pamlico Sound Bridge Corridor.*

Comment: “The Department found that some of the information presented in the SDEIS is inaccurate, misleading and confusing. As a result, the reader is left with no clear concept of the consequences the bridge project will have on the ecosystem. The final document should clearly identify the selected plan’s effects on the environment. Specific comments addressing the shortcomings of the SDEIS are provided in the following sections.”

Response: *Comments and concerns are noted and acknowledged. The specific comments have been addressed below.*

Comment: “The identified deficiencies in the SDEIS and Draft Section 4(f) Evaluation should be rectified and a revised SDEIS and section 4(f) Evaluation issued for review. We recommend the Federal Highway Administration (FHWA) and NCDOT provide revised documents that equally assess and clearly analyze the environmental impacts of both alternatives, thereby ensuring compliance with CEQ Implementing Regulations and NEPA procedures. If the FHWA and NCDOT do not revise the documents, the Department may recommend referral of this project to the CEQ.”

Response: *The Department of Interior’s comments are addressed in the FEIS.*

Comment: “The purpose of the Refuge is defined as, “...a refuge and breeding ground for migratory birds and other wildlife ...” (Executive Order 7864, dated April 8, 1938) and “for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d, Migratory Bird Conservation Act). Furthermore, the *National Wildlife Refuge System Improvement Act of 1997* states “The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” Therefore, fish and wildlife must be considered first and foremost during considerations of use of Refuge lands and management thereof. Visitor access, though important, is secondary to the Refuge’s primary mission.

The barrier island system has long been recognized as an important resource providing valuable habitat for migratory birds and other wildlife. The existing NC 12 corridor, which bisects the length of the Refuge for approximately 12 miles, fragments this important habitat and disrupts the natural coastal dune processes. Past maintenance of the NC 12 corridor and disposal of dredged sand have significantly impacted the natural biota of this system. Disposal of dredged sand has increasingly led to finer-grain sized sand, a greater percentage of heavy (dark) minerals and a resulting decrease in beach-face invertebrates. Efforts to maintain the NC 12 corridor through the Refuge (e.g. artificial dune construction, etc.) have altered the natural geological processes of the barrier island system, and thus have reduced and altered habitat available for fish and wildlife resources. The existing NC 12 corridor thus presents major challenges to the Refuge in implementing its mission and maintaining important ecological values. The need for an increasing intensity of maintenance under the Parallel Bridge Corridor alternatives must be viewed as a source of continued and expanded degradation of the ecological values of the Refuge.”

Response: *Position acknowledged. The objective of all of the alternatives considered in the Parallel Bridge Corridor was to substantially reduce the amount of NC 12 weather-related maintenance through 2060. For example, the Road North/Bridge South and All Bridge alternatives would move NC 12 west of the forecast 2060 high erosion shoreline. With the Phased Approach alternatives (including the Preferred Alternative), NC 12 weather-related maintenance activities within the Refuge would not be fully addressed*

until the completion of Phase IV. Section 4.6.8.6 describes the extent of NC 12 storm-related maintenance that would be expected prior to the implementation of Phases II to IV and its location, and section 4.7.8 discusses impacts. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement. Phase I would not change the level of NC 12 storm-related maintenance.

Comment: “The viability of the Parallel Bridge Corridor alternatives depends on continued protection of NC 12 between Oregon Inlet and Rodanthe through beach stabilization. The analysis presented in the SDEIS assumes that sand of suitable quantity and quality will be available throughout the 50-year life of the project. This assumption is not supported by the information provided in the SDEIS and other information available. Indeed, both the need for and availability of suitable beach stabilization material appear to be significantly understated, which biases the analyses of both the feasibility and costs of the Parallel Bridge Corridor alternatives. Furthermore, it is our view that a more balanced evaluation of these factors might lead to the conclusion that the Parallel Bridge Corridor alternatives will fail to meet the project purpose of providing ‘a replacement crossing that will not be endangered by shoreline movement through year 2050.’”

Response: *Only the alternatives involving nourishment rely on beach stabilization to protect NC 12. None of the nourishment alternatives were selected as the Preferred Alternative.*

Comment: “The NPS requests to review all NCDOT projects near, adjacent, or within the boundary of a unit of the NPS. Review of proposed projects should be mailed to the closest unit of the NPS and the Southeast Regional Office, Planning and Compliance Division, 100 Alabama Street, 1924 Building, Atlanta, Georgia 30303. The NPS will determine the level of environmental analysis required for all projects, including NCDOT projects that are within the boundary of a unit of the NPS. All Environmental Assessments and EIS’s must adequately address all NPS resources within the park and receive park and regional review prior to public release. Impairment determinations are made by the park superintendent. All surveys and studies/modeling must be coordinated with park superintendent. All NPS NEPA documents must contain: a definition of impact thresholds (minor, moderate and major impacts), state whether the impact is beneficial or adverse, and state anticipated duration of impact.”

Response: *The NCDOT has provided NPS the opportunity to review projects affecting units of the NPS. For this project, that includes participation on the NEPA/Section 404 Merger Team and opportunities to comment on the SDEIS, SSDEIS, and FEIS. NCDOT acknowledges that impairment determinations must be made by the park superintendent.*

Comment: “Pages v, 2-104 and 2-105 of the SDEIS state that beach nourishment would occur in four locations and likely be repeated at four-year intervals. We stress that this is highly dependent upon storm events and unprovable assumptions. Also, the discussion does not make reference to how volumes of sand were determined. Volumes presented appear to be substantial underestimates of what would be needed for beach and dune construction. For example, over 500,000 cubic yards of Oregon Inlet sand have been placed along and adjacent to the ‘Canal Zone Hot Spot’ annually for the past four years, and it has not been sufficient to protect the highway from overwash and sand deposition impacts. Based upon characteristics of material dredged from the Bodie Island Spit section of the Oregon Inlet navigation channel, the sand is marginally suitable, at best, for placement on the Refuge beach and would not likely remain in place to protect the highway for four years, given the annual cycle of destructive wind and water events. As such, it appears that the estimated beach stabilization and associated costs are understated.

Response: *An alternative that involves beach nourishment was not selected as the Preferred Alternative. Past deposition of sand from Oregon Inlet was not done as a part of a systematic program to maintain the shoreline. The sand quantities presented for the alternatives involving nourishment reflect such a program. It was not assumed that the sand used would come from the Bodie Island spit, but rather the ocean bar.*

Comment: Page 1-5, section 1.1.3 does not appear to take into account the volume of sand that has been placed on the beach as a result of dredging Oregon Inlet over the past 12 to 14 years. Volumes frequently exceed 500,000 yd³ per year. This has certainly affected estimates of erosion rates for the Canal Zone Hot Spot and segments of beach further south due to longshore transport. It should not be assumed that these volumes of sand be placed on the beach throughout the project life. As most of the sand is fine grained with a relatively high percentage of heavy minerals, it is marginally suitable for placement on the Refuge beach. Without the ability to mix the sand with medium to coarse sand there may come a time when disposal of the fine-grained, high percent heavy mineral sand will not be allowed on the Refuge beach.”

Response: *The purpose of this section was to summarize past erosion rates. The high erosion rate estimates used to develop the alternatives are described in Section 3.6.3.1 and took into account 58 years of shoreline data. It was not assumed that the sand used would come from the Bodie Island spit (where fine sand, with a relatively high percentage of heavy minerals, is found) but rather the ocean bar.*

Comment: “Page 2-70 under the heading “*Sand Requirements*” refers to sand availability. Sand availability is only minimally described in Section 2.6.3.4, not 2.6.3.2. Throughout the document, when sand requirements or beach stabilization are discussed, little meaningful information is presented with regard to suitability of sand for disposal on the Refuge beach. Also, when there is limited information on sand suitability, it is not clear what standards are being used. Standards for placing suitable sand on the Refuge beach may be different than standards established by other state or Federal agencies.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Page 2-73 refers to sand availability for beach stabilization. This discussion seems to assume that the sand is biologically suitable (e.g. correct color, mineral content and particle size) for nesting sea turtles and beach-face and swash-zone invertebrates that provide the base of the food web for many migratory bird species. If the sand is not biologically suitable, the issue could be a fatal flaw for one or more alternatives. Even if the sand currently available is biologically suitable, this does not mean the available sand will be suitable through the year 2060. Sand dynamics within the proposed source areas could change significantly. New information could change suitability criteria. It must be understood that sand determined to be not suitable by Refuge standards cannot be placed on the Refuge beach as it would compromise the purpose of providing quality habitat for migratory birds and other wildlife.”

Response: *The nourishment alternatives assumed that only biologically suitable sand could be used.*

Comment: “Page 2-73 states “...and from Oregon Inlet dredging could be used for beach nourishment ...” In this consideration, were existing dredging rates with the existing Bonner Bridge used or were forecast dredging rates with a new parallel bridge used? If the former, then available sand may be less with a new parallel bridge since the new bridge would have more and longer navigation spans, thus possibly reducing the need for channel dredging.”

Response: *This section noted a potential opportunity and not a firm intent. It was not assumed that under such an arrangement that all of the sand used in nourishment would come from that single source.*

Comment: “Page 2-105 in Section 2.8.2.1 gives no consideration to the biological suitability of sand for either nesting sea turtles or beach invertebrates providing the base of the food web for migratory birds and surf zone fish. The discussion does mention grain size, but it is important to note that grain size is not the only consideration. Other suitability factors to consider include heavy mineral content, color, and presence of contaminants, volume, timing and placement methodology.”

Response: *The nourishment alternatives assumed that only biologically suitable sand could be used, including all suitability factors.*

Comment: “Page 4-49 states ‘Where dredging is needed, the dredging would be to a depth of 8.0 feet (2.4 meters) to provide more flexibility for construction barge operations.’ Please elaborate on why 8 feet of dredging is needed for more flexibility while other areas already 6 feet deep are sufficient for barge operation and will not be dredged.”

Response: *The proposed extra depth is needed to reduce the frequency of re-dredging during project construction as the channel naturally fills in.*

Comment: “Page 4-67 states ‘One of the most important mitigation measures for beach replenishment is to replenish with sand similar to existing conditions.’ We agree, but this discussion should be expanded.”

Response: *The nourishment alternatives were not selected as the Preferred Alternative.*

Comment: “On page 4-67, hopper dredges are unable to place sand directly on the beach. They can put the sand near-shore typically in 18-20 feet of water. At such depths, only the finest component of this sand reaches the beach and then only during significant storm events. This process results in a ‘fining’ of native beach sand over time and has detrimental effects on beach biota. Also, if the sand source is the ocean bar then ocean disposal (even near-shore disposal) reduces the volume of naturally bypassed sand, thus causing increased erosion rates on the Refuge beach.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information on potential coastal process impacts that might be associated with nourishment.*

Comment: “Page 4-109 refers to dredged material from the Ocean Bar channel at Oregon Inlet being suitable for beach nourishment. Is this material biologically suitable for nesting sea turtles and beach face or swash zone invertebrates? Also, there are no references to the negative impacts associated with using sand from the Oregon Inlet channel having a higher percentage of heavy mineral content.”

Response: *The nourishment alternatives assumed that only biologically suitable sand could be used and that based on available data, that there is an adequate supply.*

Comment: “Pages vi, xxiii, 2-16, 2-80 and 2-96 of the SDEIS state that the Pamlico Sound Bridge Corridor bridge will have two 8-foot shoulders while the Parallel Bridge Corridor bridge will have two 6-foot shoulders. The SDEIS does not explain why the longer bridge requires 8-foot shoulders while the short bridge requires 6-foot shoulders. Furthermore, page xxiii states that the bridges south of the Parallel Bridge at Oregon Inlet will have 8-foot shoulders to accommodate bicycles. This makes the 6-foot shoulders on the Parallel Bridge even more confusing. This effectively eliminates accommodations for bike riding or makes it more dangerous on the Parallel Bridge without explanation. Obviously the wider shoulders on the longer bridge raise the cost versus more narrow shoulders on the short bridge. Since this scenario provides for an unequal cost comparison, the difference should be explained.”

Response: *Six-foot (1.8-meter) shoulders were used in the 1999 final design for the Oregon Inlet bridge in the Parallel Bridge Corridor. The cost estimates included in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS assumed 8-foot (2.4-meter) shoulder widths for all bridges for the replacement bridge corridor alternatives. The final design for the Phased Approach/Rodanthe Bridge Alternative (Preferred) includes 8-foot (2.4-meter) shoulders for all bridges.*

Comment: “Page 2-69 states ‘The cost estimates for the Oregon Inlet Bridge were based on the 1999 estimate revised to take into account the changes at the southern end, then escalated to 2005 dollars.’ We assume that this means that 1999 dollars were translated to 2005 dollars by applying an inflation multiplier. If so, was a construction index used to derive the multiplier?”

Response: *The cost estimates for the various alternatives were revised for the FEIS. Current year construction dollars were applied to separate estimates of material quantities. Simple escalation of past total costs was not done. These revised cost estimates also are presented in the FEIS in Section 2.12.1.*

Comment: “In Table 2-9 on page 2-110, do future costs of stabilizing beaches through 2060 account for inflation or are they in 2005 real dollars? All cost should reference the base date. Do cost figures account for TIP Nos. R-3116D, R-3116E and R-3116F not having to be implemented with the Pamlico Sound Bridge Corridor alternatives? It seems that a substantial savings would be realized from not having to construct these three projects at ‘hot spots’ within the Refuge. Also, do cost figures for the Parallel Bridge Corridor Nourishment Alternative include the cost of removing sand and water after each storm event, dune reconstruction, sand fencing, dune springing (usually several times per year), or repairing a breach or newly formed inlet in NC 12?”

Response: *Costs are in current-year dollars, except for the design-build escalation factor added with the SSDEIS and discussed in Section 2.12.1.2 in the FEIS. Costs reference the base date in Section 2.12. The discussion of capital funding in Section 2.12.4 reflects the projects in the 2009-2015 TIP in considering the availability of funds. TIP Nos. R-3116D, R-3116E, and R-3116F are not in the current (2009-2015) TIP. The*

Nourishment Alternative costs are for a systematic nourishment and dune enhancement program that would substantially reduce or eliminate the need for regular weather-related maintenance. Thus, such costs are not included in the Nourishment Alternative's cost estimates.

Comment: “Pages 2-110 and 2-111 identify several observations from Table 2-9. The first observation is an irrelevant and misleading statement since the bridge structure is obviously not a stand-alone component of the project. This statement inappropriately biases the discussion toward the Parallel Bridge Corridor alternatives and should be removed.”

Response: *The cost discussion was revised in the SSDEIS and is presented in Section 2.12.1.3 in the FEIS. The statement noted in the comment has been revised.*

Comment: “Page 2-112 refers to potentially reducing costs of nourishment by using sand from the U.S. Army Corps of Engineers (USACE) ocean bar maintenance. Again, this would only be true if the sand were biologically suitable for nesting sea turtles and beach face invertebrates. It should be noted that the USACE may do less dredging in the inlet with the longer spans of the parallel bridge as stated in the document. While some sand may be available from the outer bar, quantity would likely be far less than what is needed. Sand would have to be brought from farther away, thereby negating the inferences about cost reduction.”

Response: *This section noted a potential opportunity and not a firm intent. Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Page 2-112 states: ‘The new Oregon Inlet Bridge ... could eliminate or greatly reduce navigation span maintenance requirements, reducing the USACE’S dredging costs.’ This would also be true of the longer bridge in the Pamlico Sound Bridge Corridor. Also, reduced maintenance dredging with the Parallel Bridge would provide less sand for potential use for beach stabilization, assuming biological suitability. The Pamlico Sound Bridge would be located in a lower energy environment which would reduce overall maintenance costs and improve navigational safety as boats and barges would not have to negotiate the hazardous inlet channel and a relatively narrow navigation span at the same time in the strong currents of the inlet.”

Response: *Observations acknowledged.*

Comment: “The SDEIS fails to adequately evaluate the effects of the Parallel Bridge Corridor alternatives to fish and wildlife resources. In fact, the SDEIS is so bereft of information regarding the effects of continued and increasing fortification, maintenance and repair of NC 12 on Federal trust resources as to render the SDEIS inadequate as a basis for informed decision making.”

Response: *The objective of all of the alternatives considered in the Parallel Bridge Corridor was to substantially reduce the amount of NC 12 weather-related maintenance through 2060. For example, the Road North/Bridge South and All Bridge alternatives would move NC 12 west of the forecast 2060 high erosion shoreline. With the Phased Approach alternatives (including the Preferred Alternative), NC 12 weather-related maintenance activities within the Refuge would not be fully addressed until the completion of Phase IV. Section 4.6.8.6 describes the extent of NC 12 storm-related*

maintenance that would be expected prior to the implementation of Phases II to IV and its location, and section 4.7.8 discusses impacts. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement. Phase I would not change the level of NC 12 storm-related maintenance.

Comment: “Pages xix and 4-96 of the SDEIS state that indirect and cumulative effects of the Parallel Bridge Corridor would be minimal. Information provided in the SDEIS and other available information does not support this conclusion. The existing right-of-way footprint within the Refuge will remain an identifiable landscape feature with less than desirable wildlife habitat values for many years, even after the roadbed has been removed. The Parallel Bridge Corridor will result in adverse effects to habitat quantity and quality for the total ‘zone’ of effects. This ‘zone’ includes the footprint of the old roadbed, the footprint of the new roadbed, the area between the old and new roadbed, and an area adjacent to each side of the total footprint that will be affected by construction, maintenance or other activities. This total ‘zone’ of effects would be up to several hundred feet wide along 12 miles of Refuge, resulting in hundreds of acres of impact to the Refuge. This represents significant direct, indirect and cumulative impacts to the Refuge.”

Response: *It is our understanding that the Refuge is concerned that the potential indirect impact (which would contribute to cumulative impacts) of storm-related NC 12 maintenance would continue at current levels or worse through 2060 with the Parallel Bridge Corridor alternatives (including the Preferred Alternative), and thus, over the course of time, all parts of the Refuge east of the 2060 high erosion shoreline (the comment’s ‘zone’ of effect) would be affected by storm-related maintenance activities. This would not be the case. As noted in the response to the previous comment, the objective of all of the alternatives considered in the Parallel Bridge Corridor was to substantially reduce or eliminate the amount of NC 12 weather-related maintenance through 2060. Therefore, the indirect and cumulative impacts in the ‘zone’ described in the comment would not occur.*

However, because the Preferred Alternative is phased, some NC 12 maintenance would continue to occur until the final phase is completed. Section 4.6.8.6 describes for the Preferred Alternative the extent of the remaining NC 12 storm-related maintenance (the concern of this comment) that would be expected prior to the implementation of Phases II to IV and its location. Section 4.7.8 discusses the impacts of this maintenance. Both sections address this concern as a direct impact. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement. Phase I would not change the level of NC 12 storm-related maintenance from what is currently experienced.

Comment: “The document also fails to address the positive indirect and cumulative effects of the Pamlico Sound Bridge Corridor. The Department believes that the Pamlico Sound Bridge Corridor would produce beneficial indirect and cumulative effects on the Refuge by eliminating paved access through the Refuge, thereby reducing disturbance to wildlife and improving habitat conditions by returning the right-of-way and adjacent areas to natural conditions.”

Response: *This is now addressed in Sections 4.7.7 and 4.12.5.8 of the FEIS.*

Comment: “The SDEIS also fails to adequately address the indirect and cumulative effects of repeated beach stabilization and disruption of normal coastal processes. These processes include geological effects and ecological effects to the beach biota at all trophic levels, including marine invertebrates.”

Response: *The objective of all of the alternatives considered in the Parallel Bridge Corridor was to substantially reduce the amount of NC 12 weather-related maintenance through 2060, including beach stabilization. Thus, there would be no indirect and cumulative effects of repeated beach stabilization and disruption of normal coastal processes beyond that defined as a part of each alternative, e.g., nourishment that is associated with the nourishment alternatives. Discussion of expected weather-related maintenance prior to the completion of each phase of the Preferred Alternative is presented in Section 4.6.8.6.*

Comment: “Overall, Section 4.7 beginning on page 4-45 and Section 4.12 beginning on page 4-95 present very weak analyses of actual impacts to biotic communities with any alternative. Also, there is no discussion of the effects of habitat loss, degradation and fragmentation on the diversity, biological integrity and ecological integrity of the barrier island system as a result of possible various combinations of alternatives with the Parallel Bridge Corridor. The FWS and the NPS would be willing to work with you to better define these effects so that they may be appropriately considered in any revised document.”

Response: *A discussion of the larger issue of potential habitat loss as it relates to the scarcity of the remaining natural habitat on the Outer Banks is included in Sections 4.12.4.8 and 4.12.5.8 of the FEIS.*

Comment: “Pages xvii and 4-46 refer to ‘soon-to-be-listed threatened and endangered species in Dare County.’ Please specifically clarify what this statement means.”

Response: *This statement was removed from these sections in the FEIS.*

Comment: “Pages xxiv and 4-107 state ‘Night lighting would not occur near turtle nesting areas’ The definition of ‘near’ would need to be determined through consultation with the FWS.”

Response: *NCDOT has completed formal consultation under Section 7 of the Endangered Species Act of 1973, which addressed impacts to sea turtles. (See Section 4.7.9.)*

Comment: “Pages xxiv and 4-74 refer to the FWS’s *Precautions for General Construction in Areas Which May be Used by the West Indian Manatee in North Carolina*. This document has been revised and is now referred to as *Guidelines For Avoiding Impacts To The West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters*. This document can be found at http://ncus.fws.gov/mammal/manatee_guidelines.pdf.”

Response: *The revised guidance is referenced in the summary and Section 4.7.9 of the FEIS.*

Comment: “Page xxvi fails to give consideration to the leatherback sea turtle (*Dermochelys coriacea*), which potentially could nest within the project area.”

Response: *The biological conclusion for the leatherback sea turtle is now May Affect – Likely to Adversely Affect when on land based on formal consultation with USFWS and May Affect –Not Likely to Adversely Affect when in the water based on formal consultation with NMFS. This is noted in the FEIS summary and in Section 4.7.9.*

Comment: “Pages 2-47, 3-46 and 4-71 and Figure 3-6 refer to critical wintering habitat for piping plovers (*Charadrius melodus*). North Carolina piping plover Critical Habitat Units 1, 2, 4 and 5 were recently invalidated by Federal court order. Therefore, no designated critical habitat for the piping plover occurs within the project area. However, piping plovers are still known to use suitable habitat within the project area and effects to this species must be adequately considered. It should be noted that the FWS is currently reviewing the judge’s order and may propose re-designation of these units. Also, it should be noted that the Pamlico Sound Bridge Corridor alternatives could have a beneficial effect on piping plovers and that habitat would be restored within the existing NC 12 right-of-way in the form of overwash. Abandoning the existing NC 12 right-of-way would benefit piping plovers by reducing the amount of disturbance from humans and pets. Pet dogs and cats can be a significant source of mortality and harassment for piping plovers.”

Response: *FHWA and NCDOT have completed formal consultation under Section 7 of the Endangered Species Act of 1973, which addressed impacts to piping plovers. Critical habitat is discussed in the resulting Biological Assessment (FHWA and NCDOT, 2008) in Section 4.7.9 of the FEIS as potential critical habitat, as well as the Biological and Conference Opinions (USFWS, 2008) of USFWS (see Appendix E).*

Comment: “Page 2-116 addresses permits and the compatibility determination required by the FWS. In addition, ESA Section 7 consultation will be required for federally endangered and threatened species.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed by its NC 12 easement agreement and a compatibility determination is not required. FHWA and NCDOT have completed formal consultation under Section 7 of the Endangered Species Act of 1973 with USFWS.*

Comment: “Pages 4-39 and 5-31 address loggerhead sea turtles, but fail to address green sea turtles (*Chelonia mydas*) and leatherback sea turtles as potential nesters within the project area.”

Response: *These species were addressed during formal consultation with USFWS and the results are presented in Section 4.7.9 of the FEIS.*

Comment: “Page 4-47 refers to a ‘May Affect – Likely to Adversely Affect’ determination for piping plover and green sea turtle with the Parallel Bridge Corridor. A ‘Likely to Adversely Affect’ determination would trigger a formal Section 7 consultation. This determination may or may not be prudent for nesting sea turtles depending upon whether sea turtle nests are present at or near the project footprint and depending upon other factors such as the time of year when work activity would occur. The same determination may be prudent for loggerhead and leatherback sea turtles, if nests are present within or near the project footprint.”

Response: *These species were addressed during formal consultation with USFWS, and the results are presented in Section 4.7.9 of the FEIS.*

Comment: “Page 4-67 refers to adverse effects to loggerhead turtles from hopper dredges. This needs to be expounded upon.”

Response: *The SDEIS, SSDEIS, and FEIS include a commitment not to use hopper dredges because of their potential impact on sea turtles in the “Project Commitments” section.*

Comment: “Pages 4-72 and 4-73 address effects to leatherback, green and loggerhead sea turtles. It is possible that any of these three species could nest within the project area. The most likely species to nest in the project area is the loggerhead sea turtle. Effects to nesting sea turtles can be avoided or minimized if beach stabilization occurs outside the nesting period (May 1 through November 15). If work were to occur on the beach during the nesting season, a vigorous monitoring plan would need to be developed to determine if any sea turtle nests occur within the project area prior to and during project construction. This determination may or may not be prudent depending upon several variables. In general, more information needs to be provided as to the potential effects to sea turtles. Issues such as lighting effects of long-term NC 12 work, the effect of sand particles and color, and dredging need to be addressed. Please note that the FWS has jurisdiction over sea turtles when they nest on the beach, while the National Marine Fisheries Service has jurisdiction when sea turtles are at sea.”

Response: *The SDEIS, SSDEIS, and FEIS include a commitment to a watch program for nesting sea turtles in the “Project Commitments” section. This comment focuses on the impacts of beach nourishment. None of the alternatives involving beach nourishment was selected as the Preferred Alternative.*

Comment: “On page 4-74 the Department disagrees with the statement: ‘No habitat for the manatee occurs within the project area...’ This needs to be readdressed since manatees periodically appear near the project area.”

Response: *This statement is revised in Section 4.7.9 of the FEIS.*

Comment: “In general, the SDEIS fails to address potential environmental impacts to federally listed species as a result of maintenance, dune reconstruction, sand fencing, sprigging, removing sand and water, closing a newly formed inlet, or repairing a breach in NC 12 should the Parallel Bridge Corridor Nourishment Alternative be chosen.”

Response: *The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “Page 5-1 5 lists the peregrine falcon (*Falco peregrinus*) in a list of federally endangered and threatened species. The peregrine falcon is no longer federally listed.”

Response: *This change is reflected in the SSDEIS and FEIS in Section 3.3.*

Comment: “Page xii of the SDEIS states: ‘...would likely result in the Refuge providing some form of alternative access to the Refuge rather than the paved road desired by Dare County officials and their constituents.’ The sentence should read ‘...Dare County officials and some of their constituents.’”

Response: *This statement was revised in the SSDEIS, and the revision is included in the FEIS.*

Comment: “Pages xix, 4-39 and 4-90 state that the Parallel Bridge Corridor with Road North/Bridge South Alternative would generally support the Refuge’s and Cape Hatteras National Seashore’s (Seashore) policy to not stabilize the Outer Banks artificially. This statement is misleading because the information presented suggests extensive stabilizing features but does not include protective features such as groins or revetments that would most likely be required to maintain the road/bridge system. It is stated ‘Exceptions would be the three dunes that would eventually be built and any breach closure that may be needed to maintain the transportation corridor within the Refuge.’ These exceptions are so significant that they preclude this alternative from supporting Refuge and Seashore policy.”

Response: *Other than the existing terminal groin, protective features such as groins or revetments would not be required with this alternative given its location west of the forecast 2060 high erosion shoreline. If the Road North/Bridge South Alternative had been selected as the Preferred Alternative, changes to the alignment to eliminate the need for dunes could have been investigated.*

Comment: “The discussion on page 2-2, Section 2.1 of the ‘No-Action Alternative’ relates to Section 4.5.3.1 and the unsupported conclusion that the ability of visitors to reach the Refuge recreational resources will be adversely affected. This is a ‘negative’ presented in the document without a discussion of the positive aspects. As an addendum to the ‘No- Action Alternative,’ the Department recommends exploring the idea of an adequately planned ferry system. This could enhance a visitation experience to the Refuge even though that access may be different than historic access.”

Response: *The feasibility of the Oregon Inlet Bridge to be replaced by a ferry service as the sole means of access to Hatteras Island from Bodie Island is discussed in Section 2.2 of the SDEIS, SSDEIS, and FEIS. The cost and impact of a ferry service to the north end of Hatteras Island for recreational access is discussed in Section 2.5.3 of the SDEIS, SSDEIS, and FEIS. Neither was found to be a reasonable alternative.*

Comment: “Pages 2-15 and 2-116 refer to the fact that in order for NCDOT to construct a bridge or perform associated NC 12 maintenance or beach stabilization within the Refuge that is outside of its permitted easement, the Refuge Manager must find that the new bridge is compatible with the purpose of the Refuge stated in the 1938 Executive Order creating the Refuge and mission of the National Wildlife Refuge System found in the National Wildlife Refuge System Improvement Act of 1997. The Department does not necessarily agree that the Refuge Manager must do so. The compatibility issue will be dealt with under separate cover by the Refuge Manager.”

Response: *Position acknowledged. The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed by its NC 12 easement agreement, and a compatibility determination is not required. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.*

Comment: “Page 2-74 states: ‘Two primary risks were identified: potential for a storm-caused breach in the Refuge and faster than expected erosion of nourished beaches.’ The Department believes that these are very real and significant risks with a high potential to occur. The SDEIS appears to assume that law, regulation and policy will allow breach closure on the Refuge now and for the life of the project. New information regarding requirements for federally listed species, current policy/new legal requirements may affect what is found to be compatible over the next 50 years.”

Response: *Position acknowledged.*

Comment: “Page 2-76 states: ‘It is assumed that if it were decided that maintaining paved road access the full length of the Refuge is necessary, a Parallel Bridge Corridor with NC 12 Maintenance alternative likely would be selected for implementation and not the Pamlico Sound Bridge Corridor.’ This statement seems out of place within a description of the Pamlico Sound Bridge Corridor, and seems to be an overemphasis since the NEPA/404 Merger Team has not specifically stated that a paved road access through the Refuge is essential, and it is not part of the project purpose. While some may assume paved road access is essential, it should not be assumed that the Refuge considers the paved road as an essential feature. It is important to understand that the highway is not necessary for the Refuge to exist and fulfill its mission and purpose. The over emphasis on access to the Refuge on pages 2-76 and 2-78, tends to discount adaptability to new access. Negative aspects of future access are presented without presenting positive aspects about different means of access to the Refuge. The text overlooks the fact that those who do not return to visit the Refuge because of changes in access may be replaced by those who prefer the new means of access, relative isolation, and improved scenery and wildlife viewing opportunities afforded by the Pamlico Sound Bridge Corridor alternatives.”

Response: *This statement was made in response to comments from the public that if NCDOT built the Pamlico Sound Bridge Corridor, they also would have the expense of maintaining NC 12 in the Refuge. This statement was made to point out that such a position was not valid in light of NCDOT’s understanding that the Refuge does not consider a paved road in the Refuge essential. The final statement of the comment assumes that the Refuge would be willing and able to provide a means access to the Refuge that would readily serve the same number of visitors that the Refuge serves currently. The options noted by the Refuge to date and reflected in the FEIS do not indicate such a capability.*

Comment: “Page 2-78, Section 2.7 states: ‘If a storm-caused breach were to occur at the southern end of the Refuge, it would need to be closed or ferry service implemented to get visitors and their vehicles to and from the Refuge.’ The NPS questions whether a storm-caused breach at the southern end, or any location within, the Refuge would necessarily need to be closed to get visitors and their vehicles to and from the Refuge if the Pamlico Sound Bridge Corridor alternative is implemented. Artificially filling or closing the storm-caused breach would not be consistent with the management goals or policies of the Refuge or NPS which are oriented toward allowing the natural processes of the barrier island system to operate. The breach area would potentially provide excellent habitat for foraging and perhaps nesting birds such as the Piping Plover. And closing the breach in this case would not be necessary to maintain the transportation corridor (NC 12) between Hatteras Island and the mainland for residents or visitors. The decision to artificially close a breach or to allow the breach to close naturally, and/or to implement ferry service to provide access to the Refuge should be made based on the individual characteristics of the breach, should one occur.”

Response: *The Pamlico Sound Bridge Corridor terminates south of the Refuge. If a breach occurred at the southern end of the Refuge, the only way to reach the Refuge would be by water if the breach is not closed. A ferry would be a public means of conveying Refuge visitors across the breach to the Refuge. The FHWA and NCDOT agree that “the decision to artificially close a breach or to allow the breach to close naturally, and/or to implement ferry service to provide access to the Refuge should be made based on the individual characteristics of the breach, should one occur.”*

Comment: “Pages 2-78 and 2-112 state: ‘If a storm-caused breach were to occur at the southern end of the Refuge, it would need to be closed or ferry service implemented to get visitors and their vehicles to and from the Refuge.’ This statement presupposes that vehicular traffic is required or allowed on the Refuge. Other access options may include pedestrian traffic. A critical point to understand is that Refuge property does not carry deed encumbrances for a public transportation corridor as does NPS property. It is likely that a legal determination would be required from the Department as to which laws, regulations and policies would apply and how to comply with them when dealing with an inlet closure.”

Response: *The statement assumes only that walking or swimming across the breach would not be an option for all potential users of the Refuge.*

Comment: “Page 2-83 states that the Pamlico Sound Bridge could accommodate utility lines on the proposed bridge. Although the Parallel Bridge could also accommodate utility lines, there is a significant environmental benefit to the Pamlico Sound Bridge accommodating utility lines because of reduced disturbance within the Refuge from utility line placement, utility poles, etc.”

Response: *The impact of utility pole disturbance was included in the SSDEIS in Section 4.12.7 and is in Section 4.12.5.7 of the FEIS.*

Comment: “Page 2-116 addresses permits and the compatibility determination required by the FWS. Right-of-way permits would need to be reviewed for compatibility if the alternative chosen proposes a new use, an expanded use, a renewed use or an extended existing use. The terminal groin was authorized by a ‘Permit’ from the FWS. The permit is not characterized as a Special Use Permit or Right-of-Way Permit/Easement. We, therefore, request that the term ‘Special Use’ be deleted.”

Response: *This change was made in the FEIS.*

Comment: “Page 4-38 provides insufficient information regarding the full extent of project impacts. It is not clear how the acreages presented for each alternative were derived. To fully analyze impacts, acreage figures should include the current right-of-way, new right-of-way, and the area between the rights-of-way for a complete analysis of impacts to wildlife resources on the Refuge.”

Response: *The numbers include the area of new right-of-way or easement. There would be no project impact between the current easement and the new easement.*

Comment: “Pages 4-43 and 4-44 refer to sand availability for closing a breach of NC 12 within the Refuge. No discussion is given on whether the ocean bar source is biologically suitable for nesting sea turtles and invertebrates found in the swash zone and beach face.”

Response: *Neither of the two alternatives that utilize beach nourishment was selected as the Preferred Alternative. If one had been selected as the Preferred Alternative, NCDOT would have provided additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.6.3.4 of the FEIS pertaining to available and suitable sand sources.*

Comment: “Page 4-68 refers to disturbances to feeding and resting wintering waterfowl in Pamlico Sound. Please provide species and numbers of wintering waterfowl using this part of Pamlico Sound. Impacts to other migratory birds should not be overlooked as the purpose for establishing the Refuge was to provide habitat (refuge and breeding grounds) for migratory birds and other wildlife, not just waterfowl.”

Response: *This is done in Section 3.7.6.6 of the SDEIS and the FEIS.*

Comment: “Pages 4-68 and 5-31 discuss potential impacts of the Parallel Bridge Corridor Road North/Bridge South and All Bridge alternatives to feeding and resting water birds within the ponds of the Refuge from construction activities and long term mortality from road kill. However, nothing is said about the long-term impacts from disturbances caused by constant traffic noises or the effects of the road and road maintenance on habitat quality. Bird species more sensitive to noise impacts could be displaced by an adjacent road. The increased mortality of birds, the loss of habitat such as submerged aquatic vegetation and loss of bird use of the ponds might continue to affect the ability of the Refuge to fulfill its purpose.”

Response: *Additional material on noise impacts is included in Section 4.7.6.6 of the FEIS.*

Comment: “Pages 4-78 through 4-84 discuss several compensatory mitigation options. It should be noted that some of the compensatory mitigation measures described are not likely to be possible on the Refuge due to the position on the landscape. Impacts on Refuge resources will have to be mitigated on or immediately adjacent to the Refuge. Also, it should be clearly understood that mitigation cannot be used to make an otherwise incompatible proposed use compatible with the mission and purpose directives.”

Response: *Position understood.*

Comment: “Pages viii and ix of the SDEIS state ‘Ocean overwash is expected to continue to be a regular and increasing problem over the life of a replacement bridge.’ The Department notes that a Pamlico Sound Bridge would not be affected by ocean overwash.”

Response: *This is expected to be a regular and increasing problem if nothing is done. The Pamlico Sound Bridge Corridor is only one alternative that would not be affected by ocean overwash.*

Comment: “Pages xii and 4-19 state that replacing the Bonner Bridge with a 17.5-mile long bridge would increase vehicle travel distance from Rodanthe to the mainland by 2 miles and increase travel time by 2 minutes. While this may be valid, it seems to provide a more reliable travel route should NC 12 be covered by wind-blown sand, overwashed, flooded or breached by a storm north of Rodanthe. Two minutes may be a small price to pay to ensure reliable transportation. If the discussion remains in the document as presented, it seems reasonable to include a reference to the amount of time people currently spend waiting for sand and water to be removed from the highway on a frequent basis.”

Response: *All of the detailed study alternatives would address the problem of “the amount of time people currently spend waiting for sand and water to be removed from the highway on a frequent basis.”*

Comment: “Page 2-2, section 2.1 presents a confusing description of the ‘No-Action Alternative.’ The alternative as described cites ferry service to a resident population capable of transporting 400 to 450 vehicles per day during the summer. In contrast, a ‘between island’ ferry system provides transportation for up to 3,500 vehicles per day during the summer. This is mixing resident and tourist transportation data, and it makes no sense to then propose a ‘resident ferry system’ capable of transporting 400 to 450 vehicles per day when the need during summer could exceed 3,500 vehicles per day for the only land-based access to the barrier islands on the northern end.”

Response: *The commenter is correct that such a proposal makes no sense, which is one reason why the No-Action Alternative is not a reasonable alternative. Typically, the No-Action Alternative is a “Do-Nothing Alternative,” which in this case would mean Bonner Bridge would be removed and no access would be provided to Hatteras Island. NCDOT is obligated to provide at least minimal access, thus the addition of a minimal ferry service to the No-Action Alternative. The feasibility of a full ferry alternative is examined in Section 2.2 of the SDEIS and FEIS.*

Comment: “Page 2-60 refers to coastal modeling and assumes that the terminal groin will remain in place through 2060. What happens if the terminal groin does not remain in place through 2060?”

Response: *This situation is described in Section 3.6.2.3 of the SDEIS and Section 3.6.3.5 of the FEIS.*

Comment: “Page 2-86 refers to a service road for the Curved Rodanthe Terminus alternative. What are the wetlands and biotic community impacts of this service road, and are they included in the overall impacts for the alternative?”

Response: *They are included in the overall impacts of the alternative.*

Comment: “Pages 2-99 and 2-100 refer to a temporary detour road for the Parallel Bridge Corridor Nourishment Alternative. The Refuge compatibility issue described earlier will apply even with a temporary detour road, as permits will be required from the Refuge. The SDEIS gives insufficient information regarding the temporary detour road to fully evaluate impacts.”

Response: *The impacts are discussed in Chapter 4 of the SDEIS and FEIS. Chapter 2 only describes the design characteristics of the alternatives.*

Comment: “Page 2-101 states: ‘The four practical methods are described as follows: This statement contradicts the preceding sentence that states ‘... a work bridge and top-down construction are not practical.’”

Response: *All four methods are practical in some situations and not in others.*

Comment: “Page 3-7, Section 3.1.3.3, the National Park Service Plan, first paragraph: In the discussion of the NPS’s Management Policies (NPS, 2001), suggest stating that the NPS Management Policies are presently undergoing review and revision. A new draft NPS Management Policies was placed in the Federal Register in October 2005 for a 90-day public review and comment period.”

Response: *Section 3.1.3.3 is updated for the National Park Service in the FEIS.*

Comment: “Page 3-43 refers to an environmental impact study for groin removal. The permit for the terminal groin was issued for the expressed purpose of protecting the southern terminus of the Herbert C. Bonner Bridge. One of the conditions of the permit requires removal of the terminal groin when the purpose is no longer being served. Consequently, studies are not needed for removal of the groin as there is a legally binding agreement signed by involved parties for this action. The presumption is that environmental consequences have been considered in preparation of the permit to allow the groin. However, if a proposal to leave the groin in place after the existing bridge is no longer functional should be presented, the NEPA documentation for the ensuing permit modification(s) and Compatibility Determination would be required.”

Response: *The environmental consequences of removing the groin were not addressed in the NEPA documentation for the groin. If USFWS officials ask the NCDOT to remove the groin following completion of the demolition and removal of Bonner Bridge, the NCDOT and representatives of the USFWS would assess the impacts of groin removal in a separate environmental study, as needed, prior to any final decision to remove the terminal groin.*

Comment: “Page 4-37 refers to land currently occupied by Bonner Bridge being reverted back to the Seashore. How much land would be reverted back?”

Response: *The area reverted back to the Seashore on Bodie Island would be 6.3 acres (2.6 hectares).*

Comment: “The SDEIS does not adequately address the issues as to how the proposed construction of either bridge will effect those concessions with gross sales in excess of \$3,000,000.00 annually and which includes the operation of a fleet of 49 Charter Boats, a Head Boat as well as other visitor amenities including restrooms, a boat refueling dock, a travel trailer pumping-out station, five public boat launch ramps, 60 boat trailer parking spaces and 60 automobile parking spaces, all receiving heavy use in the summer months and on all Holidays.”

Response: *This concern relates to the affect of the project on the Oregon Inlet Fishing Center and Marina. A discussion of this concern is included in Section 4.1.5 of the FEIS.*

Comment: “Section 4(f) of the Department of Transportation Act of 1966, as amended (49 U.S.C. 303), states that the U.S. Department of Transportation may not approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that: there is no feasible and prudent alternative to the use of land from the property; and the action includes all possible planning to minimize harm to the property resulting from such use. The information presented still clearly demonstrates that implementation of any of the Parallel Bridge Corridor alternatives would violate Section 4(f), because the Pamlico Sound alternatives are clearly feasible and prudent and would minimize harm to the Refuge (a Section 4(f) property).”

Response: *Position noted. The Phased Approach/Rodanthe Bridge Alternative (Preferred), which was presented in the SSDEIS that was released after the receipt of this letter, is also a Section 4(f) resource avoidance alternative for the Refuge because it would remain within the existing NC 12 easement through the Refuge. FHWA has determined no constructive use of the Refuge would occur. All of the detailed study alternatives, including the Pamlico Sound Bridge Corridor alternatives, would use land from the Cape Hatteras National Seashore on Bodie Island.*

Comment: “Statements in Section 5.4 are difficult to follow. The conclusions seem to be based upon recreational access and dredging channels with some portions not being Section 4(f) property. There should be a statement to the effect that the ferry system would significantly minimize harm to the Refuge.”

Response: *A ferry service that would bypass the Refuge would minimize harm to the Refuge. The ferry facilities required in the Cape Hatteras National Seashore on the Bodie Island side of Oregon Inlet would increase harm to the Seashore, another Section 4(f) resource. See Section 2.2.6.*

Comment: “Page 5-41 refers to harm versus use questions being dependent upon preferences of the officials responsible for the Seashore and the Refuge. It should be acknowledged that for the Refuge Manager, these ‘preferences’ are mandated by law, regulation and policy. The Refuge Manager must use a best professional judgment approach based upon available science in the absence of any new compelling data when confronted with compatibility decisions.”

Response: *Position acknowledged.*

Comment: “Page 5-41 of the Draft Section 4(f) Evaluation states that ‘From the Bodie Island perspective there are no substantive differences that would result in the conclusion that one alternative corridor minimized harm better than the other.’ and in comparing the Parallel Bridge Corridor with the Pamlico Sound Bridge Corridor, that ‘...it could be concluded that either alternative minimizes harm, or it could be concluded that while different in type of harm, they are equal in the degree of harm.’ The Department does not agree with this statement. The Draft Section 4(f) Evaluation has determined that there will be Section 4(f) effects on the Oregon Inlet Coast Guard Station and on the Refuge from reduced or altered access of visitors if the Pamlico Sound Bridge Corridor is selected. We do not believe that these effects (from reduced or altered access) are on the same level as the Parallel Bridge Corridor’s 20.05 to 62.71 acres (Table 5-9) of direct physical impacts to the biotic communities of the Refuge. Nor does it consider the adverse effects to the Refuge resulting from 50 more years of intensive dune construction and/or beach stabilization associated with the Parallel Bridge Corridor alternatives. In general, it appears that the Draft Section 4(f) Evaluation attempts to put all alternatives on equal footing as to the level of Section 4(f) impacts. We do not believe this is the case. In addition, the evaluation does not adequately address the fact that the Pamlico Sound Bridge Corridor would produce beneficial effects to the Refuge in that many acres of Refuge land would be restored to its intended purpose. There are references throughout the document (beginning on page xiii) acknowledging that there will be a ‘substantial intrusion into the landscape of the refuge.’ This is an accurate assessment whether referencing visual impacts or fish and wildlife habitat impacts. It is not possible to continue to dissect a National Wildlife Refuge with road relocation and bridge construction projects without fragmentation of Refuge wildlife habitat, which is a direct threat to the ecological integrity of this Refuge’s barrier island ecosystem, and the very purpose for the Refuge’s existence.”

Response: *Position acknowledged. The statement referenced acknowledges the differing positions on the importance of road access expressed by the full range of stakeholders in the project area, including the public and local government officials. The statement is no longer contained in the Section 4(f) evaluation. See the current least harm analysis presented in Section 5.4.*

Comment: “Though all alternatives have some form of Section 4(f) impact, we believe the Parallel Bridge Corridor alternatives have far greater impacts in quantity and quality on lands protected by Section 4(f). Based upon Section 4(f) directives, we believe that park and refuge lands should not be used whenever there are feasible and prudent alternatives that would avoid or minimize harm to those lands. The NCDOT has clearly demonstrated that the Pamlico Sound Bridge Corridor alternatives present feasible alternatives from an engineering standpoint. This reduces the analysis to the question of prudence, which seems to be an issue of cost and visitor access. We believe that the Pamlico Sound Bridge Corridor is prudent. Access to the refuge for recreational purposes will continue regardless of alternative selected.

The Department believes that this Draft Section 4(f) Evaluation needs to be revised with particular attention being paid to the Pamlico Sound Bridge Corridor, which we believe has been demonstrated to be feasible and prudent with minimal adverse impacts, and likely positive effects to Refuge lands.”

Response: *Positions noted. The Phased Approach/Rodanthe Bridge Alternative (Preferred), which was presented in the SSDEIS that was released after the receipt of this letter, is also a Section 4(f) resource avoidance alternative for the Refuge because it would remain within the existing NC 12 easement through the Refuge and has been determined by FHWA not to have a constructive use of the Refuge. The Pamlico Sound Bridge Corridor is not practicable based on cost estimates and funding availability. See Section 2.15 for the reasons for selection of the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative.*

Comment: “We believe the Pamlico Sound Bridge Corridor, overall, has substantially fewer environmental impacts. The Pamlico Sound Bridge Corridor does not physically affect the Refuge. Either of the two alternatives for the Pamlico Sound Bridge Corridor is less expensive than two of the three Parallel Bridge Corridor alternatives. The Department continues to support the Pamlico Sound Bridge Corridor and is looking forward to engaging in discussions of the two alternatives within the corridor.”

Response: *Position acknowledged. It also is acknowledged that the addition of the Phased Approach alternatives (including the Preferred Alternative) in the SSDEIS did not change this position.*

United States Department of the Interior-April 27, 2007 (page A-20)

(This letter includes the comments from the National Park Service, the US Fish and Wildlife Service, and the Pea Island National Wildlife Refuge.)

Comment: “There are several references to project being analyzed by the Outer Banks Task Force (OBTF) throughout the SDEIS. Because of the emphasis placed on the OBTF, the SDEIS should describe the OBTF and explain the role of that organization in the overall planning process. The goals outlined in the OBTF Memorandum of Understanding (MOU) should be presented, and each alternative, including mix and match options, should be placed into the

context of level of contribution towards achieving those goals. It is acknowledged that the MOU was last renewed in 1999 and expired in 2004, but the fact that it established guiding principles for the OBTF should be clearly stated.”

Response: *The OBTF and its role are described in Section 2.2.5 of the SDEIS and Section 2.3 of this FEIS. The Phased Approach/Rodanthe Bridge Alternative (Preferred) will serve as a long-term approach for maintaining NC 12 between Oregon Inlet and Rodanthe, supporting the goals of the OBTF.*

Comment: “There are several references to the Constructability Workshop held on August 29-31, 2006, with regards to the Phased Approach alternatives throughout the SDEIS. The purpose of the workshop was to assess the feasibility of constructing the various bridges, and other structures within the existing right-of-way. We note that while the workshop addressed the feasibility of constructing the Phased Approach bridges, it is unclear whether or not it addressed the practicability of such construction. It is clear from the long history of maintenance activities on NC 12 that even relatively simple maintenance of the existing highway cannot be done within the existing right-of-way, much less construction of bridges, temporary roads, shoulders and ditches within that same right-of-way width. We recommend that the feasibility of constructing the various bridges, roads and other structures within the existing right-of-way, as well as maintenance of the highway, be discussed in greater detail.”

Response: *It was determined through bridge engineering and construction engineering evaluations that the Phased Approach (including the Preferred Alternative) is technically feasible. Technical feasibility means that design and construction of the Phased Approach physically can be performed under the constraints prescribed. Conventional construction techniques are available for heavy/highway contractors to use to build these bridges while maintaining traffic, remaining inside of the existing right-of-way, and not substantially affecting areas of SAV or wetlands, etc. The project constraints present unique complexities to the construction of the project. However, it is known that these complexities can be effectively addressed. Further explanation of construction techniques is provided in Section 2.10.2.4.*

Comment: “Page xix [of the SSDEIS] states “The potential also exists for a deep breach near the terminal groin, resulting in part from soundside erosion. It would likely need to be closed with a bridge, such as included in the two Phased Approach alternatives and the All Bridge Alternative.” We note that either of the Pamlico Sound alternatives would avoid this problem altogether. Therefore, we recommend that the text be modified to reflect this point.”

Response: *A statement saying that the Pamlico Sound Bridge Corridor would bypass potential breach locations between Oregon Inlet and Rodanthe was added to the summary section of this FEIS.*

Comment: “Page xxiii [of the SSDEIS] states “The Phased Approach alternatives would necessitate the implementation of short-term NC 12 maintenance actions in the Canal Zone and Rodanthe ‘S’ Curve...hot spots (with associated impacts) that are being planned in the context of studies by the Outer Banks Task Force.” The Department is very concerned that these short-term, interim measures to stabilize NC 12 could be used as justification to return to the status quo of repeatedly reacting to storm damage to NC 12 once Phase I is completed. Since the Phased Approach alternatives would be built in four phases over several years, we are concerned that after the Oregon Inlet Bridge is constructed (Phase I), the decision could be made to not proceed with Phases II, III and IV. The following statements on page 2-4 appear to be a tacit admission of

such: “Although the Phased Approach alternatives are described and addressed in this Supplement as a phased alternative with specific locations and lengths for the phases...these details could be adjusted based on funding availability and the changing conditions within the project area...implementation of any individual phase could be accelerated or delayed.” Due to the high costs of this project, the Department is concerned that the Phased Approach could be used to only build the Oregon Inlet Bridge and then return to the status quo of repairing NC 12 after storms and artificially maintaining the protective dune system in the Pea Island National Wildlife Refuge. This would continue to prevent natural barrier island processes from occurring, and thus adversely affect the Refuge and the fish and wildlife resources that utilize the Refuge throughout the 28-year construction timeframe.”

Response: *The intent of the statement referenced was to acknowledge the existence of the short-term NC 12 relocation studies (NCDOT TIP Project Nos. R-3116D, E/F) and that their outcome could affect the location of the NC 12 easement prior to the implementation of later phases, particularly in Rodanthe. The purpose of the short-term studies, in which Department of the Interior representatives participate as members of the merger team, is to identify short-term solutions to NC 12 maintenance. The intended purpose is not to substitute short-term solutions for long-term solutions, such as the proposed action. It should be noted that since the selection of the Preferred Alternative, planning work on these short-term studies has been suspended and none of the projects are listed in the 2009-2015 TIP.*

Additional discussion of NCDOT’s intent related to the timing of the implementation of Phases II to IV of the Phased Approach/Rodanthe Bridge Alternative (Preferred), particularly as it relates to changing coastal conditions, is included in Section 2.10.2.5 of the FEIS. Maintaining the status quo is not FHWA’s or NCDOT’s intent.

Comment: “We recommend that clarifying text be added to sections 7 and 9 on pages xxiv and xxv [of the SSDEIS]. The terms and conditions of the right-of-way easement specify, to a certain extent, what can and cannot be done within that right-of-way. The current easement for NC 12 grants authority to NCDOT for the specific purpose of constructing, operating and maintaining a public road through the Refuge and facilities, including parking for a ferry landing to be used in conjunction with the public road. The existing easement does not grant NCDOT the authority to any uses not described above. Consequently, replacing a road with a bridge may not be considered a minor modification to the right-of-way, even though all work may be entirely within the existing easement boundaries, and a determination must be conducted before a decision is made. If it is determined that the modification is not minor, an amendment to the easement will be required and that process will invoke Compatibility Determination requirements under the National Wildlife Refuge System Improvement Act of 1997 and its implementing regulations (50 CFR 26.41). In the Phased Approach alternatives, where it addresses construction, operation, and maintenance of NC 12 with the Refuge, we believe the proposed uses may not receive a favorable compatibility determination. We note that these concerns do not exist with the Pamlico Sound Corridor alternatives. Therefore, we recommend that the text be modified to reflect this requirement and potential outcome.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed by its NC 12 easement agreement, and a compatibility determination is not required.*

Comment: “It is stated throughout the SDEIS that the Phased Approach alternatives would be confined to the existing NC 12 easement within the Refuge. However, page 2-10 states “...by the time a Phased Approach Alternative is designed and built, it is possible that NC 12 will be in an

easement different from where it is today.” These are seemingly contradictory statements. Furthermore, page 2-10 states “Since the future location of such relocation is unknown, this design and assessment of the Phased Approach alternatives assumes its bridges are built within the existing easement and that the impacts would be similar in either case.” There seems to be a presumption that other NEPA documents prepared for maintenance activities and hot spot “solutions” will satisfactorily address concerns and impacts. If the intent is to relocate the existing NC 12 right-of-way on an “as needed” basis, then additional, direct, indirect and cumulative analysis of the impacts is necessary.”

Response: *The intent of the statement referenced was to acknowledge the existence of the short-term NC 12 relocation studies (NCDOT TIP Project Nos. R-3116D, E/F) and that their outcome could affect the location of the NC 12 easement prior to the implementation of later phases, particularly in Rodanthe. It should be noted that since the selection of the Preferred Alternative, planning work on these short-term studies has been suspended, and none of these projects are listed in the 2009-2015 TIP.*

Additional discussion of NCDOT’s intent related to the timing of the implementation of Phases II to IV of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is included in Section 2.10.2.5 of the FEIS. Maintaining it on an “as needed” basis is not FHWA’s or NCDOT’s intent.

Comment: “The discussion section 2.3.1.4 on page 2-20 regarding potential cost sharing for beach nourishment assumes that dredged sand is biologically suitable (e.g. for sea turtle nesting). This may not be a scientifically supported assumption. Sand that is not comparable to native beach sand with regards to physical and chemical properties, including grain size and color, cannot be placed on the Refuge beach. Allowing sand on the beach that is not suitable would be disruptive to the ecological processes in the beach face ecosystem, would degrade nesting habitat for sea turtles, and negatively impact beach invertebrates serving as a prey base for numerous migratory bird species. This is a critical point and we believe that it should be discussed in detail.”

Response: *The need for beach nourishment sand to be biologically suitable, whatever its source, is acknowledged in Section 2.8.2.1 of the SDEIS and Section 2.10.2.1 of the FEIS. The Phased Approach/Rodanthe Bridge Alternative (Preferred) does not include beach nourishment.*

Comment: “The discussion in section 2.3.1.4 on page 2-20 seems to assume that the Corps of Engineers has, and will continue to have, funding for pipeline dredging on an annual basis. This has not been the case in the past. Also, the sand from certain areas of the Oregon Inlet navigation channel may not be suitable for placement on the Refuge beach. This is due to difference in hydraulic sorting that occurs in different segments of the inlet. The DOI’s Fish and Wildlife Service has 12 years of trend analysis data which demonstrate impacts to invertebrates in the beach face. The invertebrate population declines after large sand disposal projects. Time, quantity, and spacing patterns of sand placement will affect the level of impacts to the invertebrates. Any sand placement on Refuge land should be fully coordinated with the DOI to avoid adverse impacts to our trust resources. We also recommend text be added that acknowledges Corps of Engineers’ funding uncertainties and sand suitability analysis that needs to occur.”

Response: *This section noted a potential opportunity and not a firm intent. As stated, the use of sand from ocean bar dredging was assumed and not sand from dredging within*

the inlet. It was assumed that if sand dredged from the ocean bar were not biologically compatible, then it would not be used with the nourishment alternatives. Cost sharing arrangements could have made it more feasible for the USCOE to continue dredging on an annual basis. It was not assumed, however, that under such an arrangement that all of the sand used in nourishment would come from that single source. The Phased Approach/Rodanthe Bridge Alternative (Preferred), however, does not include a nourishment component.

Comment: “The first paragraph on page 4-4 suggests that there is some confusion with the Pea Island National Wildlife Refuge Comprehensive Conservation Plan (CCP) and a Compatibility Determination. These two documents do not have the same purpose. The CCP provides guidance for Refuge management over the next 15 years to aid the Refuge in accomplishing the mission of the National Wildlife Refuge System and for achieving the purpose for which the Refuge was established. When conducting a Compatibility Determination for a proposed use, the CCP is used as a reference document and for guidance to determine whether that use will materially interfere with or detract from the mission and purpose directives. Text should be added to make this difference clear to the reader.”

Response: *The text is revised in the FEIS in Section 4.1.2.*

Comment: “Page 4-10 states “Like the All Bridge Alternative, the bridge [associated with the Phased Approach Alternatives] would present a stark contrast with the natural character of the Refuge...It would not be characteristic of the undeveloped and protected character of the Refuge that makes it rare along the eastern US seaboard in terms of views and a setting for recreation activities.” We strongly agree that such a massive, elevated bridge running through almost 10 miles of the Refuge would adversely affect the character of the Refuge. We note that these concerns are not as pronounced with the Pamlico Sound Corridor alternatives. The text within this section should be modified to reflect this point.”

Response: *The Pamlico Sound Bridge Alternative’s lack of visual impact on the Refuge is presented in Section 4.3.2 of both the SDEIS and the FEIS.*

Comment: “Section 4.6.3 on pages 4-21 through 4-26 does not fully address the issue of scour around bridge piles. The discussion does not follow through with any meaningful analysis of the ecological impacts of scour. With bridges over land which is gradually transitioning to the ocean environment, the Phased Approach bridge impacts will occur on continuum along and across the beach through time. Impact analysis should not focus on one or two species, but should include impacts to habitat quantity and quality for listed species as well as migratory birds and other wildlife over time. To fully disclose the impacts, additional analysis should be conducted for maintenance and/or repair of bridge piles, to include the potential placement of revetment or other stabilizing structures adjacent to the piles, and their effects on fish and wildlife resources inside and outside the existing easement, as well as those piles currently on land, currently under water, and those that may be under water in the future.”

Response: *Since the publication of the SSDEIS, NCDOT has conducted additional coastal research and engineering studies to address these questions. New material addressing both scour and the presence of the Phased Approach/Rodanthe Bridge Alternative (Preferred) over time is included in Section 4.6.8 of this FEIS. New material addressing design criteria for establishing pile lengths so new revetments and stabilizing structures would not be expected is included in Section 2.10.1.2 of this FEIS.*

Comment: “Section 4.7.5 on page 4-34 [of the SSDEIS] states “The two Phased Approach alternatives would have no direct impact on Refuge lands since they would be within the existing NC 12 easement,” We disagree with this statement. The Phased Approach/Rodanthe Nourishment alternative would directly affect 1,500 feet of Refuge beach outside the existing NC 12 easement. Construction noise and the presence of construction equipment will directly affect wildlife on Refuge lands immediately outside the existing easement. Section 4.7.5 also does not discuss impacts associated with potential road relocations and other maintenance activities during the time leading up to each successive phase of construction. The existing text should be modified to acknowledge these effects.”

Response: *A discussion of the maintenance activities leading up to each phase is included in Sections 4.6.8.6 and 4.7.8 of the FEIS.*

Comment: “From the information on pages 4-35 and 4-36 [of the SSDEIS], it can be determined that all four phases would require at least 13 years of actual construction during a 28-year timeframe. This amounts to a near-perpetual construction zone within the Refuge for 28 years. Section 4.7.6.5 does not adequately address the effects of this construction disturbance to shorebirds, waterfowl and other migratory birds. Also, the section does not adequately address the permanent effects to birds and other species of having a bridge on or near the beach. At some point, as the beach erodes, the bridge will be directly over the beach. Later, the bridge will be in the ocean immediately off-shore from the beach. The SDEIS does not address what the specific effects to the birds would be. We are especially concerned with the effects to the federally threatened piping plover (*Charadrius melodus*). Text should be added to address this issue.”

Response: *Additional material related to natural resource impacts of the Phased Approach/Rodanthe Bridge Alternative (Preferred), including changes in those impacts over time as the shoreline erodes, is added to Section 4.7.6 of the FEIS. Additional discussion on the effects on the piping plover is added to Section 4.7.9 of the FEIS and is based on completed formal consultation on threatened and endangered species with the USFWS per the guidelines of Section 7 of the Endangered Species Act. The USFWS Biological and Conference Opinions (USFWS, 2008) document is presented in Appendix E.*

Comment: “Page 4-37 states “However, shoreline erosion could create Piping Plover habitat under the bridges as the shoreline erodes.” This is a questionable statement since it is uncertain that piping plovers would utilize otherwise suitable habitat under a bridge. The text should be modified to reflect this point.”

Response: *This statement has been clarified in Section 4.7.9 of the FEIS.*

Comment: “The discussion on green sea turtles (*Chelonia mydas*) on page 4-38 mentions nighttime lighting, but does not describe the effects, The discussion on loggerhead sea turtles (*Caretta caretta*) on pages 4-38 and 4-39 does not mention nighttime lighting or its effects. We recommended appropriate text be added to analyze the effects of nighttime lighting to these two species.”

Response: *Additional discussion on the effects on sea turtles of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.7.9 of the FEIS based on formal consultation on threatened and endangered species with the USFWS per the guidelines of Section 7 of the Endangered Species Act. The Biological and Conference Opinions (USFWS, 2008) document of USFWS is presented in Appendix E.*

Comment: “In the discussion on seabeach amaranth (*Amaranthus pumilus*), page 4-40 states “If the species would be affected, the location containing the species would not be used for dredged material disposal.” It is unclear how NCDOT could leave a gap in its beach nourishment without compromising the structural integrity of the rest of the beach fill. Clarifying text should be added to address this point.”

Response: *This statement refers to the disposal of construction dredging material and not nourishment associated the nourishment alternatives. Note that the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative (Preferred) does not include beach nourishment.*

Comment: “The last sentence on page 4-40 implies that displaced wildlife can move to adjacent habitat with little impact. Movement and assimilations into surrounding habitat depends upon many factors such as species impacted, population density within the impacted area as well as adjacent habitat, and the quantity and quality (or suitability) of the adjacent habitat. It is inappropriate and misleading to discount impacts to wildlife by implying the affected species can simply move to adjacent habitat. The project area consists of a very narrow strand of barrier island and habitat availability is very limited, making it unlikely that wildlife displaced by project-related impacts would be able to easily locate suitable alternative habitat. The text should be modified to address this point.”

Response: *Comment acknowledged. This text is revised in Section 4.7.9.1 of the FEIS.*

Comment: “The discussion in section 4.12.2 on page 4-52 [of the SSDEIS] suggests that only the National Park Service and U.S. Fish and Wildlife Service consider ocean overwash desirable, but falls short of presenting an analysis regarding the necessity of ocean overwash for maintaining the barrier island system. Many coastal geologists, coastal engineers and scientists from other disciplines recognize overwash as a renewal process that is critical to maintaining the barrier island system (e.g., Pilkey et al. 1998, pp. 41-48). We believe the text should be modified to address the importance of overwash to coastal ecosystems.”

Response: *A discussion of the positive benefits of shoreline movement was added to Section 4.7.7 of this FEIS.*

Comment: “Page 4-53 states “The NCDOT would seek a new permit [for the terminal groin] from the Refuge to protect the new bridge.” We continue to emphasize that selecting any Parallel Bridge Corridor alternative, including the Phased Approach Alternatives would not guarantee that a new permit to retain the terminal groin will be issued. The text should be modified to reflect this point.”

Response: *NCDOT recognizes that the selection of the Phased Approach/Rodanthe Bridge Alternative (Preferred) does not guarantee that a new permit for the terminal groin would be issued. The requested statement is added to Section 4.12.5.6 of the FEIS.*

Comment: “Section 5.0 beginning on page 5-1 paraphrases the SDEIS but adds little information and analysis with regards to how the Phased Approach affects Section 4(f) resources. We believe the evaluation discounts impacts to these resources by implying that the phased work will occur within the existing right-of-way without full consideration of the direct, indirect and cumulative effects of various mix and match options of implementing the Phased Approach over time. The net effect of the analysis is that it fails to recognize that the Phased Approach is a “status quo” approach to replacing the Bonner Bridge and maintaining NC 12 through the Refuge for as long

as there is a sufficient land base for relocating the road. It appears that for 13 years out of 28, the Refuge would be in a near perpetual construction zone. The concern is that the Refuge's purpose of providing habitat for migratory birds and other wildlife could be adversely affected. Over time, the net result is a barrier island national wildlife refuge with severely degraded habitat quantity and quality for migratory birds, listed species and other wildlife. We note that these concerns do not exist with the Pamlico Sound Corridor alternatives. The text within this section should be modified to reflect this point."

Response: *Section 4(f) of the Department of Transportation Act of 1966, as amended, does not apply to the portion of the Phased Approach/Rodanthe Bridge Alternative (Preferred) that passes through the Refuge because it is confined to the existing NC 12 easement and has also been determined not to have a constructive use of the Refuge. Impacts to the Refuge are addressed both in the appropriate sections in Chapter 4 of the FEIS, including additional material related to the issues raised in this comment, and Chapter 5.*

Comment: "Construction staging area will need to be identified for equipment, materials storage and a construction camp. Cape Hatteras National Seashore is willing to cooperate with NCDOT on this issue provided that the staging sites are evaluated for potential impacts as part of the NEPA planning and compliance process."

Response: *NCDOT met with Seashore representatives to discuss potential staging sites. NCDOT has no current plans for a staging area on Bodie Island. If the design-build contractor does decide to pursue a staging area on Bodie Island, it would need to be approved by the NPS prior to the commencement of construction. Coordination with the NPS and obtaining necessary permits would be the responsibility of the contractor (including any mitigation measures stipulated). Any approved staging areas permitted by the NPS would be indicated on construction sequencing plans and submitted to the NCDOT and permitting agencies for review and comment (see Section 2.10.1.3 of the FEIS).*

Comment: "The DOI request that access is not disrupted, to the extent possible, to Oregon Inlet Fishing Center (a National Park Service Concession), the U.S. Coast Guard Station Oregon Inlet, Bodie Island Campground and Ramp 4 off-road vehicle access for Bodie Island Spit."

Response: *Minimal or no disruption of access is anticipated for the Oregon Inlet Fishing Center and the US Coast Guard Station Oregon Inlet. Any need for briefly disrupting or altering access would be coordinated with the Seashore and management of the Oregon Inlet Fishing Center.*

United States Environmental Protection Agency-December 30, 2005 (page A-24)

Comment: "EPA's review of the Supplemental DEIS (SDEIS) has identified adverse environmental impacts for all three of the final PBC alternatives. In particular, EPA is concerned with long- term impacts on water quality and critical resources, as well as the ability of these alternatives to meet the PINWR Management Plan compatibility and Section 7 Endangered Species Act (ESA) requirements. However, EPA defers to FWS, the responsible agency for a final determination of Refuge compatibility and endangered species protection. Additional information is needed regarding specific avoidance and minimization measures to PINWR. Thus, the impacts are of sufficient magnitude and duration that the PBC alternatives are rated EO-2 "Environmental Objections - Insufficient Information". Although the PBC Nourishment

alternative would seem to be more acceptable by remaining on the existing roadway alignment, the long term impacts from increased traffic, repetitive beach nourishment and sand dune replenishment and other road maintenance activities would be as detrimental to the natural resources as the new alignment alternatives.”

Response: *These positions are acknowledged.*

Comment: “EPA has assigned a rating of EC-2 “Environmental Concerns” to the PSBC alternatives because the 17.5 mile bridge over estuarine waters presents water quality concerns from construction and operation activities, with additional information needed on mitigation of those impacts. EPA’s detailed comments on the SDEIS are enclosed with this letter.

The long-term project impacts (i.e., beyond the standard highway planning period) should be fully considered by decision makers because of the unique setting and ongoing challenges of managing the PINWR and its essential habitat for migratory waterfowl. Maintaining a reliable transportation corridor along an ever-changing coastal barrier island is a concern particularly with the vulnerability of the PBC alternatives. After considering all of the issues, a relocation of NC 12 outside of PINWR would achieve long term environmental benefits to the Refuge while providing reliable transportation access between Bodie and Hatteras Islands.”

Response: *These positions are acknowledged. EPA’s detailed comments are addressed below.*

Comment: “EPA does not have any comments regarding NCDOT’s defined purpose and need for the project: (1) to provide a new access to Hatteras Island from the North, (2) provide a viable long term replacement crossing of Oregon Inlet given its extreme natural changes in navigation channel, and (3) provide a facility that will not be endangered by shoreline dynamics long term. These purposes are specific to a project exposed to the storm prone coastline and barrier island dynamics, and should be met to ensure that the best alternative is selected.”

Response: *No response is needed.*

Comment: “The SDEIS indicates on Pages 2-16, 2-80 and 2-96 that the PSBC Bridge will have two 8-foot shoulders and the PBC Bridge will have two 6-foot shoulders. It is stated that the 6-foot shoulders would accommodate bicyclists and pedestrians more safely than the existing 2-foot shoulders on Bonner Bridge. While EPA supports multi-modal options for highway projects, there is no explanation in the SDEIS why the 8-foot shoulders are considered for the PSBC Bridge but not for the PBC Bridge. This will affect the costs for the various alternatives developed by NCDOT based upon the typical design for each corridor. From a safety standpoint, it would appear that 8-foot shoulders should also be considered for the PBC bridge alternatives. Cost tables in the SDEIS should be revised to reflect similar bridge designs typical sections for PSBC and PBC.”

Response: *Six-foot (1.8-meter) shoulders were used in the 1999 final design for the Oregon Inlet bridge in the Parallel Bridge Corridor. The cost estimates included in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS assumed 8-foot (2.4-meter) shoulder widths for all bridges for the replacement bridge corridor alternatives. The final design for the Phased Approach/Rodanthe Bridge Alternative (Preferred) includes 8-foot (2.4-meter) shoulders for all bridges.*

Comment: “The SDEIS does not stress the importance of all the engineering studies and evaluations performed by NCDOT to develop the PSBC 2003 Alignment Alternatives (Page 2-41). There were efforts by NCDOT and other Merger Team agencies with substantive input from nationally recognized coastal geology experts to develop reasonable PSBC alignments. The reason for developing the PSBC alignments was to provide for an avoidance alternative for potentially severe environmental impacts to the PINWR.”

Response: *NCDOT acknowledges the importance of these efforts. They are sufficiently described in Sections 2.3 and 2.4 of the SDEIS and the FEIS.*

Comment: “The SDEIS identifies the challenges associated with the development of a PBC with NC 12 Maintenance on page 2-58. The main challenges are as follows: Coastal Erosion and Breach Formation, Existing NC 12 Easement, Wetlands, Refuge Management Plan and Legal Requirements, Disposition of the Terminal Groin, and Dare County’s Desire to Maintain Road Access to the Entire Refuge. The SDEIS states that multiple approaches to long-term NC 12 maintenance were evaluated and that there was coordination with resource and regulatory agency representatives on the three detailed study alternatives for PBC with NC 12 Maintenance. As recently as May 23, 2005, the Merger Team met and was presented seven PBC alternatives and the PSBC alternative for detailed consideration. Appendix B contains Merger Team concurrence Forms. There is no Merger Team concurrence in Appendix B or descriptions of the three detailed study alternatives for PBC with NC 12 Maintenance, EPA concurred on the NCDOT’s desire to perform additional environmental analysis on the PBC with NC 12 Maintenance alternative (in addition to PSBC).”

Response: *The concurrence form referenced is that of October 2004 in Appendix B of the SDEIS and Appendix D of the FEIS. Specific alternatives were not listed in the concurrence form. The Merger Team was briefed on the final decision on specific alternatives on May 25, 2005. All Merger Team meetings are described in Sections 8.3 and 8.5 of the SDEIS, Section 8.2 of the SSDEIS, and Sections 8.3, 8.5, and 8.8.1 of this FEIS.*

Comment: “EPA has environmental objections to the NC 12 relocation to the west of the existing NC 12 easement, which includes the PBC with Road North/Bridge South and PBC with All Bridge alternatives. Both of these alternatives have severe and permanent environmental impacts to the PINWR (including compatibility with Refuge management goals, direct negative impacts to threatened and endangered species, severe impacts to wetlands, and to the Refuge as a Section 4(f) historic property). EPA also has environmental objections to the PBC with Nourishment alternative. Even though this alternative does not require any new right of way for NC 12 or the new bridge, it includes significant beach re-nourishment and new dune construction within the Refuge. As shown on Figure 2-9a, the length of beach re-nourishment and new dune construction for the PBC with Nourishment alternative would be 7 to 8 miles along the 15.2 miles of the existing corridor. Nearly all of this proposed construction and shoreline maintenance would occur within the PINWR. EPA has additional and specific comments regarding ‘Nourishment’ and the PBC with NC 12 Maintenance alternative challenges below.”

Response: *These positions are acknowledged. None of the alternatives referenced were selected as the Preferred Alternative.*

Comment: “On page 2-64 of the SDEIS, NCDOT itemizes six additional ‘Representative Combination Alternatives for PBC with NC 12 Maintenance alternative segments. Table 2-8 provides a breakdown of cost, sand requirements and wetland “use” for these six additional detailed study alternatives. Wetland impacts for the three ‘Relocate Road’ alternatives and All Bridge alternative range between 34.3 acres and 81.0 acres. EPA considers bridging wetlands in this coastal environment a permanent adverse environmental impact to natural resources. Shading from bridges and other impacts from human activities (e.g., run-off from roadway deck drains which includes toxic contaminants from dripped motor oil and anti-freeze, brake lining dusts, etc.) alter the function and affect quality and use of those wetlands for wildlife purposes. The full direct, indirect and cumulative impacts from relocating NC 12 within the Refuge are not evaluated sufficiently in the SDEIS with regard to effects to protected species or other wildlife. For the two remaining ‘Representative Combination Alternatives’ in Table 2-8, including PBC with Nourishment and PBC with Nourishment North/Bridge South, the quantities of sand needed are estimated at 46,633,300 and 18,216,600 cubic yards assuming re-nourishment requirements every four years, average erosion rates, etc. EPA considers all of these PBC ‘Representative Combination Alternatives’ to be environmentally objectionable and do not provide an avoidance alternative to the Refuge.”

Response: *This table was used to assist in the selection of the detailed study alternatives. Impacts of the detailed study alternatives are presented in Chapter 4 of the SDEIS, the SSDEIS, and this FEIS.*

Comment: “The PSBC alternatives with either a Curved Rodanthe Terminus or an Intersection Rodanthe Terminus were developed for a viable, long-term solution to avoid impacts to the Refuge, minimize impacts to Section 4(f) properties, minimize permanent impacts to jurisdictional wetlands, minimize impacts to Submerged Aquatic Vegetation (SAV), and keep the long-term transportation interruptions on NC 12 (for providing goods and services between the mainland and Hatteras Island) to a minimum. EPA would still have environmental concerns with a Pamlico Sound Bridge alternative because of the contaminant runoff from the bridge deck. These water quality concerns can be adequately addressed, however. Providing reliable transportation in such a dynamic coastal barrier island setting is less difficult with the bridge over the Sound than through PINWR on Hatteras Island. The SDEIS has adequately demonstrated that the PSBC alternatives fully meet the requirements defined in the Purpose and Need Statement as the most reliable and environmentally sound solution for the replacement of Bonner Bridge. The useable life of the new bridge and the PBSC relocation of NC 12 could exceed current predictions for the 2060 design year without major rehabilitation or repair. The Project Commitments section indicates that the estimated full life of the bridge to be as much as 100 years.”

Response: *These positions are acknowledged. Additional material related to water quality impacts is included in Section 4.7.2 of the FEIS.*

Comment: “Drs. Fisher, Riggs and Overton and others have done detailed and intensive studies on coastal geology and shoreline erosion rates along the northeastern North Carolina coastal system since 2000. The panel of experts identified five potential breach sites (Page 3-38). However, it is not possible for these experts to predict the actual storm event which will potentially cause the breaches. These sites are vulnerable due to underlying geologic conditions, historic inlet formations, magnitude and characteristics of past storm events, stability of Oregon Inlet, etc. And while beach nourishment and new dune construction may reduce the potential for breach formation (Pg. 3-39, Dr. Robert Dean), a single storm event could remove all of the sand to nourished areas. Most of the panel members generally agreed that it may only take one severe storm event to cause another breach in one of the sites they identified. Page 2-74 of the SDEIS

identifies the two primary risks: the potential for a storm-caused breach within the Refuge and faster than expected erosion of nourished beaches. There is no statistical analysis regarding the frequency or likelihood of a storm-caused event supporting the vulnerability assumptions. EPA fully agrees with the panel's breach and 'normal' erosion rate vulnerability analyses."

Response: *No response is needed.*

Comment: "What is not emphasized in the SDEIS regarding breach formation or in 'normal coastal erosion models' is the potential break in NC 12, traffic disruptions for indefinite periods, safety issues for persons needing to obtain emergency services and medical care following a severe storm event, and the potential cost in millions for local and regional businesses while repairs to NC 12 are being made. Such events would impact tourist use, reliance of the permanent Hatteras Island population on mainland goods and services, emergency evacuation requirements if there was another pending storm before repairs were completed, and totally disrupt the estimated 5,400 vehicles per day (2002 Annual average daily traffic). The adverse economic impacts of the loss of NC 12 due to island breach were analyzed and presented beginning on page 4-14. While the analysis addresses a one and three month average time of NC 12 closure, it did not consider the economic impact of the six month closure defined by the expert panel. It also appears that the timeframes considered were for closing the island breach only, so additional time and money would be needed for the reconstruction of the roadway.

It should also be noted that the NC 12 roadway could be made impassible by less severe storm events than a complete breach of the island. Removing the NC 12 route from the vulnerable sections through the PINWR essentially eliminates this economic concern. Further, peripheral towns like Rodanthe serve as gateways to wilderness areas and it could realize an economic benefit from a PSBC alternative."

Response: *All of the detailed study alternatives are located west of the 2060 high erosion shoreline, placed on bridges, or involve a regular schedule of beach nourishment with the expectation that the regular NC 12 maintenance that currently occurs following storm events would no longer occur once the project is complete. The one exception is the effect of breaches that might occur on alternatives that do not bridge potential breach locations. As noted in the comment, the economic impacts associated with breaches are discussed in the SDEIS and FEIS. The economic impact of a six-month closure is estimated as twice the economic impact of a three-month closure. The time allotted for breach closure includes time to replace the pavement.*

Comment: "Under the two PBC alternatives with Nourishment and New Dune Construction, EPA has environmental objections with such potential large-scale maintenance and construction activities. ... These massive re-nourishment and construction activities will significantly impact both wildlife and human activities within PINWR. The SDEIS has predicted that massive maintenance and construction activities would be required every 4 years. The SDEIS does not fully address the direct and indirect and cumulative impacts to listed species from such dredging and maintenance operations. ...EPA further understands that there may also be problems with not only finding consistent sand grain size, but also with the color of the sand compared to existing beach conditions. FWS has found that color can alter the heating effects and ultimately the sex characteristics in nesting sea turtles..."

On Page 4-78 of the SDEIS, NCDOT indicates that they will work with environmental resource and regulatory agencies to develop plans for nourishment, dune construction, and dredged material disposal plans that would minimize harm to natural resources. While this is a general

minimization statement, it does not provide detail on how minimization would actually occur considering the priority will be to immediately re-open NC 12 to traffic following a significant storm event. These accepted minimization plans become ineffective following a storm related disaster, and there are numerous emergency repair requests that follow such storm events. While these minimization plans may address normal shoreline erosion effects, they do not provide any assurance that long-term harm is not caused to listed species and wildlife from repeated emergency or interim actions. ... The history of public notice emergency maintenance actions along the Outer Banks, suggests a 1-2 year frequency, not 4 years, should be assumed. There are also significant environmental impacts from sand dredging activities in a coastal environment, especially in areas designated as essential fish habitat (EFH) and other benthic communities. The SDEIS only provides generalized information on these potential impacts and does not specifically address how these negative impacts will be either avoided or minimized through the selection of one of the PBC with Nourishment alternatives.”

Response: *All of the detailed study alternative are located west of the 2060 high erosion shoreline, placed on bridges, or involve a regular schedule of beach nourishment with the expectation that the regular NC 12 maintenance following storm events that currently occurs would no longer occur or be minimized once the project is complete.*

Comment: “History and scientific studies along the Outer Banks indicate that breaches will form at some point in the future from a severe storm along NC 12 in PINWR. ... Various coastal geology experts retained by NCDOT have generally characterized that there is a probability that a breach or multiple breaches will occur during the project design life ending in 2060, page 3-39. Thus, it is reasonable and foreseeable that daily traffic along NC 12 (with a PBC alternative requiring beach or dune nourishment) will be disrupted until emergency repairs to NC 12 can be made. Experts estimate the time and costs for each breach event ranged from 3 to 6 months (page 4-45) and from \$7.28 million to \$10.66 million, respectively, depending on quantity and distance to the borrow site (page 4-44).”

Response: *NCDOT recognizes the probability of breach formation within the project area. Section 3.6.2.2 of the SDEIS and Section 3.6.3.2 of the FEIS address breach formation. The Phased Approach/Rodanthe Bridge Alternative (Preferred) would bridge the predicted potential breach locations in the project area. It should be noted that the All Bridge Alternative would also have bridged these locations.*

Comment: “EPA supports the National Park Service (NPS) policy on beach re-nourishment activities along the Cape Hatteras National Seashore and other lands under Federal stewardship. NCDOT has estimated the total length of beach requiring regular nourishment at 6.3 miles. Nourishment is proposed to occur in four National Seashore locations, “likely repeated at four-year intervals” (Summary - pages v and vi). There is no specific technical analysis presented in the SDEIS which compares these estimated beach nourishment activities with other projects along the Outer Banks. In some areas along Cape Hatteras National Seashore, EPA understands that beach nourishment projects are proposed and occur on an annual or biennial basis in order to keep replacing lost sand from certain beaches (e.g., Salvo) to protect NC 12.”

Response: *The four-year interval, as opposed to an annual or biennial interval for nourishment, described for the alternatives involving nourishment assumed that adequate quantities of sand would be placed on the beach to permit four years of erosion before a new round of nourishment would be needed. However, the Phased Approach/Rodanthe Bridge Alternative (Preferred) does not include beach nourishment.*

Comment: “As stated in the SDEIS, any improvements to NC 12 outside of the existing 100-foot easement would require a right-of-way permit from the FWS. At past Merger meetings which EPA attended, FWS representatives from the Refuge indicated that a permit would not be issued for any improvements outside of the existing right-of-way. Given that the FWS is the Federal steward of the PINWR, EPA defers to FWS on that issue.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.*

Comment: “Actual Section 404 jurisdictional wetlands losses for PBC alternatives range from 4.28 to 78.15 acres (Table 4-12). For the two PSBC alternatives, total jurisdictional losses are 4.84 and 4.18 acres. Avoidance and minimization to jurisdictional wetlands is preferable when there are clear alternatives that can meet the purpose and need for the project. From a Section 404 perspective, a permit can be issued to the least damaging practicable alternative so long as that alternative does not have other significant adverse environmental consequences. While the jurisdictional impacts to wetlands are relatively low for the PBC Nourishment alternative, as discussed previously, there are significant environmental and cost impacts associated with massive shoreline re-nourishment initiatives. Furthermore, as noted previously, the PBC alternatives may not address the long-term stability of the NC 12 corridor and Section 7 issues under the ESA.”

Response: *This position is acknowledged.*

Comment: “Table 5-8 of the SDEIS identifying the biotic community impacts on just Bodie Island within the Cape Hatteras National Seashore is unclear. Actual impacts to jurisdictional wetlands from PSBC alternatives are 0.79 acres from shading effects only. Actual jurisdictional impacts to wetlands from PBC alternatives are 0.37 acres from fill and 1.50 acres from shading effects. The table totals would appear to show a greater wetland impact from PSBC alternatives. The non-jurisdictional impacts 10 upland man-dominated areas represent the largest impact category in the table for PSBC alternatives (i.e., 2.17 acres).”

Response: *This table was removed for the FEIS.*

Comment: “The wetland impacts from the two ‘non-nourishment’ PBC alternatives represent significant and permanent impacts to PINWR. The SDEIS does not provide a full environmental analysis as to the impacts to wildlife at the Refuge as a result of wetlands loss. There would be the direct loss of other habitat. In addition, there would also be extensive habitat fragmentation and we have noted evidence of collisions between vehicles and waterfowl. Collisions between waterfowl and passenger vehicles from raised highway facilities surrounded by waterfowl impoundments and foraging wetland areas can be severe and represent an unsafe roadway condition. Shifting the road to the west of the existing easement into these wetlands and other essential wildlife habitat areas does not provide a reasonable balance between safe transportation needs and minimizing harm to the natural environment.”

Response: *Wildlife impacts both in wetlands and uplands are addressed in Section 4.7.6 of the SDEIS, the SSDEIS, and the FEIS. The position indicated on the need to balance safe transportation needs with minimizing harm is acknowledged.*

Comment: “Finally, as a point of technical issue is NCDOT’s categorization of “shading” being an impact to Pamlico Sound bottom. Table 4-11 indicates the PSBC (bridge) having 73.8 acres of shading impact to the Sound in water depths deeper than SAV habitat. While shading should be considered a negative impact over any vegetated areas because of the reduced light available for plant photosynthesis, scientific data should be referenced to document functional impact to the bottom of the Sound. To our knowledge, finfish traverse and utilize habitat under bridges, and the benthic epifaunal and infaunal communities are not functionally compromised by shading from bridges. These are areas of already very low light intensity below the recognized depth extent of SAV habitat.”

Response: *It is acknowledged that finfish traverse and utilize habitat under bridges, and the benthic epifaunal and infaunal communities are not functionally compromised by shading from bridges.*

Comment: “In summary, our primary wetland concerns are the long-term habitat and wildlife impacts of the PBC alternatives to the PINWR from direct jurisdictional wetland losses, habitat fragmentation and ongoing re-nourishment activities. Our wetland concerns with the PSBC alternatives are the direct wetland losses ranging from 4.18 to 4.84 acres and any impacts that may be due to open water shading.”

Response: *This concern is acknowledged. NCDOT is committed to avoiding and minimizing wetland and other habitat impacts to the extent possible.*

Comment: “Page 2-58 of the SDEIS identifies the PINWR management plan as a “challenge” to the PBC alternatives. This challenge could be the most pronounced in moving the proposed bridge replacement project forward. In 2001, the Refuge management gave a preliminary determination that the Oregon Inlet bridge in the PBC alone ‘cannot be found compatible’ [with their Management Plan] and a right-of-way permit cannot be issued. The SDEIS has not identified any change to the Refuge’s opinion from 2001. Through the NEPA/404 Merger Process, EPA has not learned of any condition which has altered FWS’s position on the PBC alternatives. It is EPA’s understanding that the Refuge management cannot act on a permit until an application has been submitted and other requirements have been completed (e.g., Formal consultation under Section 7 of the ESA). It is also EPA’s understanding from past Merger Team meetings that FWS representatives do not desire paved access through the Refuge and have a goal of reducing disturbances to wildlife and improving habitat conditions by returning the right-of-way and adjacent areas to natural conditions. EPA gives deference to the FWS on the long-term management goals for PINWR. Disposition of the Terminal Groin at Oregon Inlet is a similar matter to the Refuge Management Plan and the potential need for a compatibility determination by the FWS.”

Response: *Despite the Refuge’s position, NCDOT studied the Parallel Bridge Corridor Alternatives because of the concerns over loss of Refuge access if the Pamlico Sound Bridge Corridor was constructed and because of funding concerns given the high initial cost of the Pamlico Sound Bridge Corridor. The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement for which NCDOT has a permit. Therefore, a compatibility determination is not required.*

Comment: “EPA understands Dare County’s concern regarding access to the Refuge, including fishing at the north end of Hatteras Island and continued retention of the terminal groin. However, access for many National parks, forests and refuges in the U.S. are through other modes of transportation, including boats, off-road vehicles, hiking, etc. Few national wildlife

refuges (NWR) in North Carolina provide paved access for the public throughout their property limits (e.g., Swanquarter NWR, Great Dismal Swamp NWR, Currituck NWR, and Pocosin Lakes NWR). There are numerous other opportunities for beach access and fishing along the Outer Banks and on Hatteras Island that are not within PINWR. Between the Village of Hatteras and the Town of Rodanthe, there are approximately 34 miles of beach access and alternative fishing areas serviced by NC 12. There are extensive beach and recreational opportunities on Bodie Island within the Cape Hatteras National Seashore available to the public. Where appropriate and consistent with the Refuge Management Plan, Dare County officials, NCDOT, FHWA and FWS should explore other opportunities for accessing and enjoying the Refuge beaches and natural trails (e.g., bicycle and hiking trails).”

Response: *The economic impact assessment in Section 4.1.5.3 of the SDEIS and the FEIS takes into account visitor use of other recreation areas should direct road access to the Refuge be lost. Opportunities for providing alternate access are discussed in Section 2.3.3 of the SSDEIS and Section 2.10.1.2 of the FEIS, as well as Section 4.5.3.1 of the SDEIS and FEIS.*

Comment: “The SDEIS provides extensive discussion of the Section 4(f) property impacts to Cape Hatteras National Seashore and PINWR. The Section 4(f) evaluation, while very detailed, appears to provide an incomplete representation of the nature and severity of the impact from the PSBC alternatives to the PINWR. While the Refuge’s three purposes and objectives are stated on Page 5-9, the impact evaluation focuses more on the lost opportunities for public enjoyment. The removal of traffic along existing NC 12 and from the Refuge would appear to fully meet the prime Refuge objectives: provide nesting, resting and wintering habitat for migratory birds and provide habitat and protection for endangered and threatened species. EPA disagrees with the statement of harm on Page 5-41 of the SDEIS concerning the PSBC and PBC alternatives under the Section 4(f) evaluation (“they are equal in degree of harm”). The intensity and degree of harm from the PBC alternatives are direct, permanent and negatively alter the function and management of the Refuge. The lack of paved access to the former Oregon Inlet Coast Guard Station and the potential reduction in visitors to the PINWR from paved NC 12 access can not be measured as equal in degree or intensity.”

Response: *The statement on page 5-41 of the SDEIS acknowledges the differing positions on the importance of road access to the Refuge expressed by the full range of stakeholders in the project area, including the public and local government officials. The Phased Approach/Rodanthe Bridge Alternative (Preferred) does not constitute a Section 4(f) use of the Refuge. See the least harm analysis in Section 5.4.*

Comment: “The PBC alternatives have less of an impact to businesses and residences than the PSBC alternatives but the impacts are low for a project of this length. There is an advantage of the PSBC Rodanthe Intersection Terminus alternative particularly by lessening relocation of Rodanthe businesses.”

Response: *This position is acknowledged.*

Comment: “Mitigation for road and bridge operational impacts is addressed throughout the document. Construction impacts are addressed including those of temporary access to construction and demolition areas discussed beginning on page 4-58. It is indicated that a temporary haul road would be necessary over open waters and emergent wetlands. EPA appreciates that impacts from these actions are unavoidable but that they can be minimized by available technique and technology. Temporary haul roads and bridges are differentiated in the

document, but we wish to state that not all haul roads need to be on fill material. Temporary board roads could lessen impacts to wetlands. The loss of SAV is problematic because the altered physical conditions may not allow SAV to recover, and the success rate for SAV restoration is very poor. Accordingly, the loss of SAV should carry a higher mitigation ratio than the minimum 1:1 ratio mentioned for other wetlands.

It is noted that the “top down construction technique” to minimize the impact to aquatic and wetland communities was rejected in the 1993 review. While a partial top down technique is mentioned in the SDEIS to be possible for some construction, EPA requests further consideration particularly if a PSBC alternative is selected.”

Response: *These positions are acknowledged, and impacts from temporary haul roads and bridges will be minimized to the extent possible. The Pamlico Sound Bridge Corridor was not selected as the Preferred Alternative.*

United States Environmental Protection Agency-April 20, 2007 (page A-29)

Comment: “...EPA has assigned a rating of EC-2 “Environmental Concerns; additional information is requested” for both of the PBC-PA alternatives because of the potential impacts to jurisdictional waters of the U.S., the long-term effects to water quality, the long-term impacts to the Refuge including the permanent impact to migratory birds, the severe visual impacts to the Cape Hatteras National Seashore, the prolonged impacts to natural resources from construction and maintenance activities, and the severe risk of constructing additional bridges (between “hotspots”) along the NC 12 corridor that will be subject to ocean wave conditions. Maintaining a reliable transportation corridor along an ever-changing coastal barrier island is a concern particularly due to the vulnerability of the PBC and PBC-PA alternatives. In light of the many issues presented in the 1993 DEIS, the 2005 SDEIS and this SSDEIS, EPA recommends a re-consideration of some of the preliminary alternatives that were not studied in detail, including the rehabilitation of the existing Bonner Bridge combined with continued NC 12 maintenance activities and permanent ferry service.”

Response: *Regarding rehabilitation, currently a major maintenance effort (NCDOT TIP Project No. B-5014) is underway to add an estimated ten years to the life of the current bridge. To completely rehabilitate the bridge for a long-term life would require replacing every part of it, essentially building a new bridge (and requiring the structure to be closed during construction) (see Section 2.2.4 of the SDEIS and the FEIS). The capacity, environmental impact, and cost concerns associated with a ferry alternative are addressed in Section 2.2.6 of the SDEIS and this FEIS remain valid. A reassessment of the bridge rehabilitation and ferry service alternatives is not needed.*

Comment: “However, with the ongoing vulnerable coastal conditions the most viable, long-term alternative for the NC 12 corridor appears to be the relocation of the roadway off the barrier island system and into the more protected Pamlico Sound. Therefore, based on all the analyses to-date the PSBC alternatives would provide, on balance, the best long-term and reliable solution with the least overall environmental impacts.”

Response: *This position is acknowledged. The reasons for selecting the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative are presented in Section 2.15 of the FEIS.*

Comment: “EPA does not have additional comments regarding NCDOT’s defined purpose and need for the project: (1) to provide a new access to Hatteras Island from the North, (2) provide a viable long term replacement crossing of Oregon Inlet given its extreme natural changes in navigation channel, and (3) provide a facility that will not be endangered by shoreline dynamics long term. These purposes are specific to a project exposed to the storm prone coastline and barrier island dynamics, and should be met to ensure that the alternative is selected. With regards to the PBC-PA alternatives, EPA is not convinced that these additional alternatives can reasonably meet purpose #3 above. The periodic construction of new bridges along the existing NC 12 corridor at the ‘hotspot’ locations will most likely be exposed to the full intensity of storms and ocean wave conditions. EPA has attempted to find other bridges in the U.S. (and Worldwide) where permanent bridges are constructed in the wave break zone along barrier island formations. EPA has been unable to find other barrier island bridges that are similarly proposed under the PBC-PA or PBC alternatives.”

Response: *Position acknowledged. NCDOT also knows of no similar bridges to those with the Phased Approach alternatives (including the Preferred Alternative).*

Comment: “EPA is concerned that the transportation agencies may not be giving previously rejected alternatives an equal comparison to the current alternatives under full consideration. As the cost of the bridge replacement options currently under detailed study has increased exponentially within the last few years to more than \$1 billion, the rehabilitation of the existing bridge alternative discussed on page ix of the SSDEIS should be reconsidered. EPA recognizes the potential problems with the existing Bonner Bridge including extensive corrosion of reinforcing steel, major spalling of concrete, extensive pile scour, insufficient ship impact strength, and the narrowing of the navigation span zone due to channel migration. Unfortunately, the continued operation and maintenance efforts to keep the existing bridge minimally safe are also costing millions of dollars each year. While the reasons to eliminate this preliminary alternative were valid more than a decade ago, the need for a new structure considering both the significant costs and the potentially severe environmental impacts makes a re-evaluation that more meaningful. EPA as a member of the Outer Banks Task Force has seen the photographs and other documentation provided by NCDOT on the condition of the existing bridge and the substantial repair measures to keep the bridge minimally safe. EPA is not discounting the challenge of trying to rehabilitate the existing Bonner Bridge and address the issues mentioned above. However, the decision to eliminate this alternative at the feasibility stage was made more than 15 years ago without the full understanding of barrier island dynamics.”

Response: *Regarding rehabilitation, currently a major maintenance effort (NCDOT TIP Project No. B-5014) is underway to add an estimated ten years to the life of the current bridge. To completely rehabilitate the bridge for a long-term life would require replacing every part of it, essentially building a new bridge (and requiring the structure to be closed during construction) (see Section 2.2.4 of the SDEIS and the FEIS). A reassessment of the bridge rehabilitation alternatives is not needed.*

Comment: “When the Bonner Bridge was first constructed across Oregon Inlet in 1962, the science and engineering concerning the dynamics of barrier islands was not fully known to transportation officials. EPA has been unable to find a similar structure located along a barrier island anywhere else in the U.S. or worldwide. Since the time it was initially constructed, it is has become apparent to a number of highly regarded scientists, engineers and other interested parties contracted by NCDOT and FHWA that the effects of building a bridge along a barrier island represents a substantial risk and a huge public investment. As stated in the SSDEIS, “Beach erosion, however, has increased problems with ocean overwash along NC 12 south of

Bonner Bridge. Ocean overwash is expected to continue to be a regular and increasing problem over the life of a replacement bridge. Increasing the length of the existing Bonner Bridge either through the selection of one of the PBC alternatives or PBC-PA alternatives by miles of new bridges will only increase the future risk and public investment to keep NC 12 open by additional bridging. The planning for the replacement of Bonner Bridge began just 30 years after its opening. The concept that the new bridge(s) located in a parallel corridor (regardless of the construction method or timeframe) will ‘safely’ last 50 or more years into the future is not realistic considering the present condition of Bonner Bridge. Thirty (30) years after the potential replacement of the 2.7 mile new Bonner Bridge, planning for its replacement will need to be made before Phase IV of PBC-PA alternative would even be completed in Post 2030. All of the PBC alternatives will continue to be subject to shoreline erosion, high winds, storm surges, erosive waves, beach overwash, inlet migrations, hurricanes and other extreme conditions.”

Response: *Position acknowledged. All bridges designed after October 2007 must be in accordance with FHWA’s Load and Resistance Factor Design (LRFD) specification. LRFD defines design life as the “Period of time on which the statistical derivation of transient loads is based: 75 years for these Specifications.” Because of the adverse conditions of the project area, corrosion protection measures beyond those called for in these specifications will be used in an effort to extend this statistical design life.*

Comment: “Similar in some respects to the Rehabilitation alternative, EPA believes that the Ferry alternative should also be reconsidered. Since 2002 when EPA became involved in the Merger process for this project the costs for the replacement bridges alternatives have doubled and in some cases tripled previous cost estimates. Notwithstanding some of the significant potential environmental and socio-economic impacts from providing a reliable ferry service between Bodie Island and Hatteras Island, North Carolina currently has one of the finest ferry services in North America. The Ferry alternative would mostly likely have a significant impact to the bay bottom environment from dredging the required navigational channel as well as some substantial impacts to wetlands. This alternative would also potentially reduce the level of service across Oregon Inlet and increase emergency evacuation time. It would also have a potential economic impact to Dare County. Nonetheless, the potential magnitude in cost increases and significant environmental impacts to PINWR from the bridge replacement alternatives makes its complete elimination from further detailed study possibly premature. NCDOT currently maintains a reliable and much longer ferry service between Swan Quarter and Ocracoke Island and Cedar Island and Ocracoke Island. An expanded, robust and reliable ferry service as well as other economic opportunities could make this alternative more attractive than a strict bridge replacement alternative. Cost estimates for operating a ferry service to the north end of Hatteras Island including regular maintenance dredging are estimated by NCDOT and FHWA at \$500,000,000, which is more than \$100,000,000 less expense than the PBC Road North/Bridge South alternative (Page 2-24 and Table 2-1).”

Response: *The capacity, environmental impact, and cost concerns associated with a ferry alternative are addressed in Section 2.2.6 of the SDEIS and this FEIS and remain valid. A reassessment of ferry service alternatives is not needed.*

Comment: “Considering expert opinions from renowned scientists contracted by NCDOT and FHWA, any significant storm event that hits the project study area at the correct angle with a certain duration and/or intensity could cause major breaches along NC 12 at the hot spots. Not counting damaging ‘Northeasters’ like the recent one on April 15, there have been 46 hurricanes to hit the N.C. coast in the last 150 years (Riggs, NC Climate Change Commission, 2006). On average, that is almost one hurricane every three years. At a minimum, emergency ferry service

should be considered between Bodie Island and Hatteras Island as a contingency for any of the PBC alternatives and realistic costs projected for these contingencies. The extended construction timeframes for new bridges as well as executing emergency roadway repairs for the PBC alternatives should require that very specific contingency plans be made part of this overall EIS analysis.”

Response: *NCDOT currently has an emergency ferry service between Hatteras Island and the mainland.*

Comment: “The PBC-PA Rodanthe Bridge alternative would utilize four phases to construct NC 12 as a bridge for the entire length of the project (i.e., Bodie Island to Rodanthe) except for 2.1 miles in the southern half of PINWR. The PBC-PA Rodanthe Nourishment alternative would be again a phased approach for construction with the exception that beach nourishment would take the place of a bridge option near Rodanthe. From Section 2.2.2.4 of the SSDEIS, it appears that the total construction time frame is estimated to be 12.5 years of active construction over the first 20 years of the phased project. These post-Phase I (Current TIP cycle, 2009-2015) phases, include approach roadways, beach nourishment activities, new access frontage roads near Rodanthe, etc. Considering responses to weather-related overwash conditions at the Rodanthe ‘S’ Curves Hot Spot, Sandbag Area Hot Spot, and Canal Zone Hot Spot during the proposed construction phases, PINWR would be subject to disruptions and intensive human activities for a majority of the time over the next 20 years.”

Response: *Potential NC 12 maintenance activities associated with storms that could occur before the implementation of each phase are discussed in Section 4.6.8.6 of this FEIS. The potential impacts on natural resources of these activities are discussed in Section 4.7 of this FEIS. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.*

Comment: “As noted during EPA’s review of the 2005 SDEIS, NCDOT and FHWA continue to propose two typical sections for the two basic corridor alternatives. For PSBC, the typical section is two 12-foot travel lanes and two 8-foot shoulders. For the PBC alternatives, including PBC-PA alternatives, the typical roadway section is two 12-foot travel lanes and two 8-foot shoulders. However, the typical section for the Oregon Inlet bridge for the PBC alternatives would provide two 12-foot lanes and two 6-foot shoulders. EPA is uncertain as to why there are two different designs for the replacement bridge structure and the NC 12 bridges, especially considering safety issues for bicycles and pedestrians.”

Response: *Six-foot (1.8-meter) shoulders were used in the 1999 final design for the Oregon Inlet bridge in the Parallel Bridge Corridor. The cost estimates included in Section 2.3 of the SSDEIS and Section 2.12 of the FEIS assumed 8-foot (2.4-meter) shoulder widths for all bridges for the replacement bridge corridor alternatives. The current design for the Phased Approach/Rodanthe Bridge Alternative (Preferred) includes 8-foot (2.4-meter) shoulders for all bridges.*

Comment: “The SSDEIS addresses the potential for a breach to occur at various locations along Hatteras Island (the ‘Hot spots’), depending upon the alternative selected. It is very likely that the placement of bridge pilings out in the ocean or in the near shore area may cause significant scouring that could lead to additional breaches or much greater breaches during storm events. The PBC-PA alternatives are designed and planned for addressing the ‘historic’ hot spots, not their accelerated formation or the increased size of new inlets along Hatteras Island.”

Response: *The potential for scour adjacent to bridge piers once portions of the Phased Approach/Rodanthe Bridge Alternative (Preferred) are in the ocean is discussed in Section 4.6.8 of the FEIS.*

Comment: “On page 5-6 of the SSDEIS, there is a discussion of impacts to PINWR. It is noted that the SSDEIS clearly identifies that the PBC-PA alternatives cause ‘substantial visual intrusion’ into the landscape of the Refuge, including the portions that contribute to the Refuge’s National Register eligibility. This section also describes the temporary and permanent impacts to the Refuge, including construction noise from driving or jetting piles and land disturbance. There are also localized impacts to the Refuge from PBC-PA alternatives to air quality from diesel equipment exhaust, lighting impacts during nighttime construction, the relocation of utilities, etc.”

Response: *The commenter’s observations on the SSDEIS content are correct.*

Comment: “The SSDEIS states on page xxiii that telephone and electrical lines along existing NC 12 will likely need to be moved one or more times between now and year 2060. However, it is not clear whether these costs were included in the costs of the PBC and PBC-PA alternatives. It is important to note that it is less likely that utilities will need to be moved for the PSBC alternatives.”

Response: *These costs are included in the other public costs tables, Tables 2-11 and 2-12. They are not considered a part of project costs because their relocation is associated with shoreline erosion and not the project.*

Comment: “On page vii of the SSDEIS, there is a discussion concerning the proposed 25-foot vertical clearance of the bridges associated with PBC-PA alternatives. This discussion needs to be included for all of the PBC alternatives and reflected in the costs for the different alternatives.”

Response: *All project costs were revised for the SSDEIS and reflected NCDOT’s understanding of current requirements.*

Comment: “Permanent jurisdictional impacts for the PBC-PA Rodanthe Bridge and PBC-PA Rodanthe Nourishment alternatives are 3.11 acres and 3.08 acres, respectively. Both alternatives include 12.45 acres of temporary impacts to jurisdictional waters of the U.S. While permanent impacts to wetlands have been substantially reduced from the PBC alternatives by proposing the PBC-PA Alternatives, the temporary impacts are greater. These ‘temporary impacts’ to wetlands from the PBC-PA alternatives include temporary traffic maintenance roads which may be quite long-lasting due to repeated compaction and disturbance. While technically these impacts are not permanent fill in wetlands, these temporary impacts will cause the general degradation of these high quality systems. In addition, the duration of construction impacts have also been extended over a much greater time frame, thereby, increasing the risk of other potential impacts.”

Response: *As discussed in Section 2.10.2, it is expected that temporary impacts would last approximately three years, the length of the construction for each of Phases II to IV.*

Comment: “One significant environmental concern that EPA has with the PBC-PA alternatives is the potential for leakage and spillage of oil and accidental releases to waters of the U.S. The longer construction period for the PBC-PA alternatives increases the probability that a spill or release of hazardous materials will occur into jurisdictional waters from all of the heavy equipment. Considering the sensitive ecosystem of the coastal wetlands in the project study area,

even a minor spill could have significant adverse effects to wildlife and recreational activities such as surfing and fishing. As a general rule, it is far less costly and difficult to clean up an oil spill in a more placid bay-sound system, than it is in an ocean or near shore condition. Spilled oil could be spread much farther and faster near the beach and wave areas. The waters in the project study area are classified as Class A Salt Waters, with a supplemental classification of High Quality Waters (SA-HWQ).”

Response: *Only Phase I of the Phased Approach/Rodanthe Bridge Alternative (Preferred) would be built over water or coastal wetlands. Phases II to IV would be built within the existing NC 12 easement while it is still on land.*

Comment: “The SSDEIS notes that the PSBC alternatives increase the amount of highway storm water runoff. However, the SSDEIS does not describe the appropriate designs and methods that can ameliorate these additional amounts. On page 4-28, the SSDEIS states that the PBC-PA alternatives could also permanently affect water quality in the near shore area, but diminishes the significance of the storm water inputs by asserting that the flushing and wave action of the ocean will dilute the pollutants. EPA does not prescribe to the use of ‘dilution as an acceptable solution to water pollution. The transportation agencies should plan to treat polluted runoff from the PBC-PA alternatives in the same environmentally acceptable manner as it would for all of the other alternatives.”

Response: *Additional analysis of water quality impacts and mitigation has been added to Section 4.7.2 of the FEIS.*

Comment: “The SSDEIS describes wetlands and open water habitat impacts in Section 4.7.4. EPA notes that there is a great deal of emphasis on shading impacts to SAVs (Submerged Aquatic Vegetation) and open water, especially noting that the PSBC alternatives have the greatest impact. While this is an impact, it is not in the same category of complete and total impact caused by permanent fill in coastal wetlands. Because of the north-south orientation of the barrier islands, NC 12 and the different alternatives, shading may have less of an impact to aquatic resources than what is being implied in the SSDEIS. The SSDEIS does not highlight the difference in the type and severity of the impact and consistently confused impact information by listing all of the biotic community type impacts with jurisdictional impacts.”

Response: *Separate tables for jurisdictional impacts were provided in the SSDEIS and FEIS. Wetlands and other jurisdictional impacts are also biotic community impacts. Total biotic community impacts should be presented.*

Comment: “Furthermore, the predicted permanent wetland impacts on page 4-31 are not consistent for the PBC-PA alternatives described on page 4- 41. The discrepancy should be corrected or explained.”

Response: *Any inconsistencies have been corrected.*

Comment: “Tables 4-1 and 4-2 of the SSDEIS are excellent examples of how information is being confused for the reader, including total fill and pile placement impacts. Biotic communities that are 0 acres impact should be de-emphasized or removed from the tables in order to make the actual impacts for the particular alternatives clearer. Impoundments, wetland man-dominated, wetland overwash, wetland reed stand, upland reed stand, salt flat, brackish marsh and upland black needlerush impacts are all ‘0.00 acres’ and could easily be removed from Table 4-1 to make it

easier for the reader to discern the actual permanent impacts. The same issue applies to Table 4-2 for temporary impacts: Seven (7) out of 22 biotic community types are '0.00 acre' impacts."

Response: *The commenter's opinion is noted, but it is felt that it is also important to indicate the community types that are not affected.*

Comment: "EPA does not understand why the costs presented in Table 2-1 for wetland mitigation (excluding SAVs) for the PSBC Curved Rodanthe Terminus alternative is substantially higher than the PSBC Intersection Rodanthe Terminus or the PBC-PA alternatives. NCDOT and FHWA should explain this difference and the assumptions used in developing these cost estimates. NCDOT and FHWA should begin consulting with the resource agencies concerning compensatory mitigation opportunities."

Response: *The cost per acre is the same. The difference is in the area of wetland taken. The FEIS wetland mitigation section reflects coordination with resource agencies on potential mitigation sites.*

Comment: "The PSBC will not result in permanent disturbance to Significant Natural Heritage Areas (SNHA) as identified by the North Carolina Natural Heritage Program (NCNHP). All of the PBC and PBC-PA alternatives will result in permanent and temporary impacts to the Refuge that has been identified as a SNHA by NCNHP. The PBC and PBC-PA alternatives potentially impact the Green sea turtle (*Chelonia mydas*) and Piping plover (*Charadrius meloders*), and the SSDEIS states that the Section 7 biological conclusion for these two species is 'Unresolved'. EPA defers to the U.S. Fish and Wildlife Service (FWS) on formal consultation issues, proposed mitigation and the compatibility permit for the Refuge. The SSDEIS states that the FWS issued the PINWR Comprehensive Conservation Plan in September of 2006. EPA notes on page 4-37 of the SSDEIS that a potentially unsubstantiated claim is being made regarding PBC-PA alternatives and the Piping plover. The SSDEIS states, 'However, shoreline erosion could create Piping plover habitat under the bridges as the shoreline erodes'. The Piping plover nests in open beach areas in a sand depression along the high beach close to the dunes. The nests are sometimes lined with small stones or shell fragments. EPA can not find anywhere in the literature where Piping plovers would nest under a highway bridge. This statement should be corrected in the FEIS or provided with a supporting, relevant literature source. According to FWS website information on the Piping plover, there are several factors contributing to the decline of the threatened species along the Atlantic Coast, including commercial, residential and recreational development, human disturbance (often curtails breeding success), human pets such as dogs, and developments near beaches that provide food and attract predators. The PBC-PA (and PBC) alternatives would include long-term construction activities (12 out of the first 20 years) that will increase noise, air emissions of mobile source air toxics (MSATs) and other pollutants, nighttime lighting, food sources (and potentially litter) from construction crews, and other related impacts in the right of way and near potential beach nesting habitat. On page 4-37 of the SSDEIS it is stated that the only method of ensuring that Piping plover would not be negatively affected by construction of the proposed project is through monitoring efforts to evaluate changes in the distribution of suitable habitat and the responses of breeding plovers to construction and demolition activities. EPA believes that another method would include intensive surveying efforts prior to construction to identify existing and historic breeding sites and providing and strictly enforcing a substantial buffer to these areas. As further stated in the SSDEIS, the dynamic nature of the Oregon Inlet area results in a continually changing distribution of suitable habitat for plovers. Because of this dynamic environmental condition (which the species has become adapted to over time), efforts to avoid suitable habitat areas in the Refuge is actually the best method to ensuring that the species is not negatively affected. Monitoring the species after construction has begun is potentially too

late to avoid or minimize potential impacts. Compared to the PSBC alternatives, the PBC-PA (and PBC) alternatives would appear to have the greatest potential impact to this threatened species.”

Response: *The results of formal consultation on threatened and endangered species with the USFWS, including the associated Biological Assessment, and Biological and Conference Opinions (USFWS, 2008) are presented in Section 4.7.9.1 of the FEIS. The Biological and Conference Opinions (USFWS, 2008) document prepared by USFWS is in Appendix E. The statement related to the creation of piping plover habitat under bridges is revised in the FEIS.*

Comment: “The SSDEIS states that the PBC-PA alternatives could permanently disrupt feeding and migrating birds within the near shore area once the shoreline erosion places the bridges south of Oregon Inlet in the ocean (Page 4-35). This permanent impact to migratory birds would appear to EPA to be inconsistent with PINWR’s Comprehensive Conservation Plan and the Refuge’s overall mission.”

Response: *Position acknowledged. The USFWS will be responsible for determining whether or not the Parallel Bridge Corridor alternatives are consistent with the Pea Island National Wildlife Refuge Comprehensive Conservation Plan.*

Comment: “Section 4.6.3 of the SSDEIS addresses the issues of bridge piles from the PBC-PA alternatives on scour and longshore sediment transport. There are several critical issues unresolved concerning the placement of bridge piles in the near shore area to the ocean. On page 4-21 of the SSDEIS it is stated that scour would be modeled during the final design of bridges associated with the selected alternative to ensure adequacy of foundations as it relates to scour. As stated in the SSDEIS, ‘Bridge foundations designs must ensure that, even with scour, piles are buried deep enough to support the bridges. EPA believes that scour modeling for PBC-PA alternatives needs to be conducted prior to the selection of the preferred alternative. This scour modeling is necessary to ensure that the bridges can be safely supported and the depth of the piles is not ‘unreasonable’ or ‘infeasible.’ The SSDEIS also states that the presence of piles near the Canal Zone hot spot could accelerate the development of an island breach at this location during storm events. EPA believes that there are technically available laboratory scale models that could confirm this hypothesis. The SSDEIS also acknowledges that scour has been studied extensively in the laboratory but then maintains that field data is lacking (Page 4- 23). The SSDEIS then extensively describes the efforts and the excellent source of data from the U. S. Army Corps of Engineers Field Research Facility VRF) at Duck, N. C. From this detailed analysis concerning “G/D ratios” (typical distance between piles to pile diameter), there is an acknowledgement that the combined impact of multiple groups over the length of the bridge could result in a scouring effect associated with the entire structure (referring to the PBC-PA Phase II Canal Zone hot spot area). The pier modeling assumptions in this analysis indicate that a similar problem would not occur for the Phase II, III, and IV bridge locations and that scouring would be localized around the smaller diameter, individual piles. While these assumptions may be realistic for normal wave conditions, specific storm events could change the localized scour prediction and major breaches could be triggered. Regarding longshore sediment transport, the SSDEIS states that it is not possible to draw a one-to-one correlation with what has happened at the FRF’s pier because of the difference in the orientation of the structure with what is being proposed for the PBC and PBC-PA alternatives (perpendicular versus parallel). It is acknowledged that a change in bathymetry could affect cross-shore transport (of sediment) during storm events. There is further recognition in the SSDEIS that the presence of structures (i.e., piles) would accelerate the development of a breach during storm events. The bridge elements in the upland areas are also expected to disrupt

normal sand wind-borne transport mechanisms and reduce sediment in the backshore areas of the beach. The questions that concern EPA are not if the normal sand and sediment transport processes will be affected by the PBC and PBC-PA alternatives but to what degree and what are the likely indirect and cumulative impacts associated with these potentially drastic changes to the coastal landscape.”

Response: *Additional analyses of potential scour and other potential effects of the presence of the Phased Approach/Rodanthe Bridge Alternative (Preferred) in the ocean have been added to Section 4.6 of the FEIS.*

Comment: “EPA acknowledges that the transportation agencies have separated the actual bridge replacement and NC 12 costs from the ‘other public costs’ as was requested by a number of the Merger team agencies after the issuance of the SDEIS. Page 2-21 of the SSDEIS includes a discussion of Refuge access should one of the PSBC alternatives be selected. If there were a storm-caused breach at the southern end of the Refuge, there appears to be a perception that a ferry service would need to be implemented to get visitors and perhaps their vehicles to and from the Refuge. EPA is uncertain as to under what conditions there would be visitors at the Refuge following a storm event strong enough to cause a breach in the island.”

Response: *It is assumed that the breach would not be closed, and there would remain a desire to allow the public to visit the Refuge in the long-term.*

Comment: “Tables 2-1 and 2-2 of the SSDEIS provide the highway cost to 2060 in ‘low’ estimates and ‘high’ estimates for the different alternatives. It is interesting to note that the ‘low’ estimated costs for the PBC-PA alternatives are relatively in the same range as the PSBC alternatives (i.e., \$1.1 to 1.2 billion versus \$1.3 billion, respectively). EPA recognizes the ‘unknown’ or only partially known information and factors relating to project costs on page 2- 5 of the SSDEIS. EPA also understands the issues of the higher inflation factor for the PSBC alternatives, the change in contract type to design-build, etc., which has dramatically increased project cost estimates. EPA acknowledges that the PBC alternatives Nourishment and Road North/Bridge South continue to have the lowest total highway cost to 2060. EPA has previously stated its environmental objections to these two alternatives in its 12/30/05 letter on the SDEIS. The cost estimates for the road and bridge operation and maintenance to the year 2060 are also presented in Tables 2-1 and 2-2. EPA does not comprehend the method by which these projected costs were forecasted. The operation and maintenance costs for the PSBC alternatives are more than all of the other alternatives and greater than the actual bridge replacement costs for all of the PBC and PBC-PA alternatives. NCDOT and FHWA have projected operation and maintenance costs for the new 18-mile PSBC alternative bridges at approximately \$356,000,000 to the design year at 2060. The PBC All Bridge alternative operation and maintenance cost is estimated at only \$274,000,000 for a 16-mile structure. The total construction cost for all of the PSC and PBC-PA alternative new bridges (16-mile structures) are estimated between \$260,000,000 and \$290,000,000. EPA requests that the detailed assumptions used in developing the operation and maintenance costs be provided to the Merger Team agencies at the upcoming scheduled Concurrence Point 3 Least Environmentally Damaging Practicable Alternative (LEDPA) meeting. NCDOT and FHWA should be able to develop realistic cost estimates from other existing long bridges that are along the Outer Banks. EPA recognizes that operation and maintenance costs for a structure within the sound may be more expensive (referring to the 4th bullet comment in Section 2.3.1.3). However, EPA believes that the weather conditions and other storm events are not as severe in the Pamlico Sound as they are on the near beach alternatives and there should be less drastic repairs required for the PSBC alternatives. Also, the typical section for the PSBC alternatives include two 8-foot shoulders and should make roadway access for

routine operation, inspection and maintenance activities less difficult and easier than the existing Bonner Bridge and NC 12.”

Response: *The requested information describing how the operations and maintenance costs were developed was provided to the Merger Team in the context of meetings associated with the selection of the LEDPA. It was noted the maintenance costs are higher on bridges than on roads on land. The Pamlico Sound Bridge Corridor alternatives include the longest length of bridges of the detailed study alternatives considered.*

Comment: “EPA has reviewed the generalized information contained in Section 2.3.4 of the SSDEIS regarding capital funding. NCDOT and FHWA identify that there may be innovative financing techniques to help fund the proposed project, including the issuance of revenue bonds against one or more long-term sources of revenue. It is cited that many states use innovative techniques to finance large projects or transportation improvement programs, including future FHWA Federal-Aid funds, State motor fuel taxes and the use of local taxes and fees and tolls. EPA is unsure how these capital funding techniques are truly innovative, as many states, including North Carolina, are already using these additional ‘non-traditional’ funding mechanisms. From past Merger meetings within the past year, EPA understands that the funds allocated in the NCDOT’s Draft 2007-2013 Transportation Improvement Program are insufficient to fund the bridge replacement construction for any of the alternatives currently under consideration (i.e., \$207,252,000 TIP FY09 versus \$260,000,000 for PBC Nourishment, Road North/Bridge South, All Bridge and \$294,000,000 for PBC-PA Rodanthe Bridge and Rodanthe Nourishment). EPA requests that NCDOT and FHWA provide more detailed information on capital funding issues and commitments for the LEDPA meeting.”

Response: *The requested information was provided to the Merger Team at the Merger Team meeting associated with the selection of the Preferred Alternative on June 20, 2007 (see Section 8.10.1.2).*

Comment: “The SSDEIS does not discuss the potential cumulative and secondary impacts from Sea Level Rise (SLR). This emerging yet documented issue needs to be evaluated fully for the different alternatives in the FEIS. There are now predictions from the N.C. Climate Change Commission concerning SLR and its impacts to the shoreline of North Carolina (A number of papers and presentations can be found through a search at <http://www.ncleg.net/gasscripts/documentsites/browsedocsites.asp?>). On page xii of the SSDEIS, historic beach erosion trends were used for the development of the worst-case 2060 shoreline. However, this analysis does not appear to take into account likely future trends due to SLR. The predicted shoreline may not be at the locations that are presented in the SSDEIS. In fact, the worst case shoreline along Hatteras Island is projected by NCDOT where there may not be a shoreline present or the shoreline will have significantly shifted to the west (Riggs, NC Climate Change Commission, 2006; Page 19) due to SLR. Shoreline forecasts in the SSDEIS apparently did not consider what many scientific experts are reporting on SLR effects to the N.C. coasts. The effects of SLR may also require much more nourishment and dune construction than is discussed in the SSDEIS. The amount and estimated schedule of beach nourishment should be re- evaluated based upon SLR projections within the project study area. The magnitude, costs and duration of these beach maintenance activities may have been substantially under-estimated in the 2005 SDEIS and SSDEIS.”

Response: *Discussions of accelerated sea level rise are included in Sections 3.6.3.3 and 4.6.6 of the FEIS, including a peer exchange workshop on the topic conducted as a part of the analysis.*

Comment: “One of the recommendations to the N.C. Climate Change Commission in a recent report (Radar, Implications of Changing and Rising Seas for Coastal NC, 2006) was the proposal to prohibit new public and publicly licensed or permitted infrastructure in flood-prone and storm-surge-prone areas. The construction of new and extended bridges along the existing NC 12 corridor (PBC Alternatives, including PBC-PA Alternatives) would appear to be inconsistent with this technical recommendation.”

Response: *The proposed project replaces existing infrastructure and as such is not new.*

Comment: “There are acknowledgements in the SSDEIS that there will be other impacts from the PBC-PA alternatives, including for example the change in surfing, fishing and other beach recreational activities, the change in access to the Refuge, reduced flexibility for the USACE to move the dredged channel at Oregon Inlet as the channel migrates, and the visual impact from a raised bridge for approximately 10 miles or more within PINWR (Page 4-10). EPA was unable to find an analysis or discussion within the SSDEIS that addressed the increased safety concerns for vehicle-avian species collisions. Gulls and other seashore birds often use elevated structures for floating on prevailing air currents. Some of these birds would also be attracted to the elevated roadway from litter and uneaten food. The near shore wind currents can be very strong and highly variable and the potential frequency of collisions is more likely with the PBC-PA alternatives than with the PSBC alternatives.”

Response: *Additional discussion of the potential for traffic and bird collisions has been added to Section 4.7.6.6 of the FEIS.*

Comment: “EPA recognizes that a new section on MSATs has been included in Section 4.9.2 of the SSDEIS. EPA has previously stated its concerns about the use of a qualitative type assessment being offered under FHWA’s interim guidance. There is some project specific information contained in the SSDEIS, including the estimate that potential MSAT emissions will be 17 percent higher for the PSBC alternatives because of its longer length. This potential increase, however, would appear to be essentially negligible as it relates to human health impacts as there are no near roadway receptors or sensitive populations located in Pamlico Sound.

The analysis does not address the potential near-road exposures of fishermen and other users of the Refuge from existing and future MSAT pollutants for the PBC and PBC-PA alternatives. Also, the context of most MSAT research is intended to examine the potential impacts to the human environment, and not to wildlife. Since the project is almost entirely within the Cape Hatteras National Seashore and PINWR, the transportation agencies should further explore this issue with the FWS, the North Carolina Wildlife Resource Commission and other university experts regarding any impacts of toxic compounds and other air pollutants from the project on native wildlife populations.”

Response: *The MSAT assessment did not find that any of the alternatives would result in substantial MSAT-related impacts.*

Other

The United States Department of Agriculture-Natural Resources Conservation Service also sent letters on March 8, 2007 and April 4, 2007, but did not have comments.

8.12.2.2 State

North Carolina Department of Environment and Natural Resources-January 23, 2006
(page A-37)

Comment: “The Pamlico Sound Bridge Corridor would be a new alignment bridge within the Pamlico Sound and is approximately 17.5 miles. Construction of this bridge would require about 8 miles of dredging. This raises issues with water quality in reference to turbidity associated with construction and possible direct impacts to SAVs. We found the environmental document lacked information on SAV impacts due to incomplete surveys and incomplete details associated with the 8 miles of dredging. In 1994, the department favored using top-down construction in wetland and SAV areas. This type of construction technique provides a means of minimizing environmental impacts especially in relation to the Pamlico Sound Bridge Corridor. While the Pamlico Sound Bridge Corridor has been identified as costing more than the Parallel Bridge, the Pamlico Sound Bridge would bypass the Pea Island National Wildlife Refuge, avoid expensive long term beach nourishment and be a more reliable source of transportation for a longer length of time.”

Response: *The SDEIS and SSDEIS relied on available sources of information on SAV locations. The Pamlico Sound Bridge Corridor was placed at depths in Pamlico Sound that reduced the likelihood for SAV impacts. Cost estimates for the Pamlico Sound Bridge Corridor alternatives assumed the use of work bridges rather than dredging in likely SAV areas. Detailed SAV surveys would have been conducted to identify SAV locations more specifically had the Pamlico Sound Bridge Corridor been selected as the Preferred Alternative.*

Comment: “The Parallel Bridge Corridor alternative with beach nourishment would use the existing NC 12 through the Pea Island National Wildlife Refuge. This alternative is approximately 12.5 miles and would require continued protection of NC 12 between Oregon Inlet and Rodanthe through beach stabilization. The Parallel Bridge Corridor with nourishment has its own unique impacts due to moving barrier islands. As noted in the SDEIS, this proposal would impact wetlands and coastal wetlands. The Parallel Bridge Corridor with nourishment could affect natural ecological conditions within the Refuge and beach organisms in both the short and long term. With this said, the SDEIS notes that this alternative will cause minimal secondary and cumulative impacts due to the fact that the replacement bridge corridor alternatives would not alter area development. Considering the effects of construction on the Refuge, fish and wildlife habitat and long term maintenance and repair of NC 12, the department does not agree that secondary and cumulative impacts will be minimal and finds the SDEIS inadequate in this manner.”

Response: *Section 4.7 of this FEIS includes an expanded discussion of the direct natural resource impacts associated with the Phased Approach/Rodanthe Bridge Alternative (Preferred) over the extended time frame of construction. NCDOT and FHWA consider all impacts associated with the proposed action, including construction, to be direct impacts and not indirect and cumulative impacts. A discussion of the impacts of NC 12 maintenance prior to the implementation of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.7. All of the detailed study alternatives are located west of the 2060 high erosion shoreline, placed on bridges, or involve a regular schedule of beach nourishment with the expectation that the regular NC 12 maintenance associated with shoreline erosion that currently occurs following storm events would no longer occur once the project is complete.*

Comment: “We concur that access to the island should be maintained in a safe, efficient manner that will not be subject to shoreline movement. The environmental document should adequately recognize the long-term impacts of replacing the Bonner Bridge and provide appropriate documentation that all environmental impacts have been considered and analyzed. In identifying the inconsistencies, the department feels the SDEIS falls short of being an efficient decision-making document. Examining secondary and cumulative impacts are also essential. The department finds misleading statements throughout the document. For example, the department does not agree that bridge alternatives are equal in the degree of impacts. We do not agree that the Department of Transportation has fully evaluated the long-term environmental impacts of keeping NC 12 intact at its current location due to beach erosion and the uncertainty of coastal storms. Nourishment would occur in four locations and could be repeated at four-year intervals until 2060? Under these circumstances will compatible sand be available to nourish NC 12 until 2060? The SDEIS noted there may be adequate and compatible sources in the area but details were not available. Did the Department of Transportation consider inflation cost for sand replacement?”

Based on the attached comments and the desire to move this project forward it is recommended that agency comments be adequately addressed in the FEIS. It is also imperative that the U.S. Department of Transportation determines if they will approve the use of 4(f) lands and the compatibility determination needs to be resolved by the U.S. Fish & Wildlife Service in order to determine the best possible alternative. In bringing these various issues to the surface, the department cannot specifically support any alternative at this time.”

Response: *A nourishment alternative was not selected as the Preferred Alternative. If it had been selected as the Preferred Alternative, additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.10.2.1 of the FEIS pertaining to available and suitable sand sources would have been identified. The costs for all alternatives are in current-year (2006) dollars, as is customary in these studies; however, the cost estimates for all activities through 2060 have been included. The Phased Approach/Rodanthe Bridge Alternative (Preferred) remains within the existing NC 12 easement, and will not have a constructive use of the Refuge. As such, Section 4(f) does not apply to this alternative except on Bodie Island where it would use land from the Seashore. Also, since the Phased Approach/Rodanthe Bridge Alternative (Preferred) remains within the NC 12 easement within the Refuge, a compatibility determination is not required.*

North Carolina Department of Environment and Natural Resources-April 12, 2007 (page A-39)

Comment: “The Phased Approach/Rodanthe Bridge Alternative consists of four phases with a construction timeframe of 12.5 years. The phased approach raises both short and long term environmental concerns. Of particular interest is the potential to cause permanent damage to the natural ecological conditions within the refuge and surrounding areas. The department continues to raise issues about erosion impacts, sediment, impacts to wetlands and coastal wetlands and sand sources for nourishment. In addition, more specific concerns and informational weaknesses are identified in the attached comments from our resource agencies.”

Response: *This position is acknowledged. The specific comments are addressed below for the various divisions of the North Carolina Department of Environment and Natural Resources.*

Comment: “It appears as though the Parallel Bridge Corridor with Road North/Bridge South alternative and the Parallel Bridge Corridor with All Bridge alternative are the least preferred alternatives due to significant impacts to Coastal Area Management Act (CAMA) Coastal Wetlands. We therefore recommend that these two alternatives be dropped from further consideration.”

Response: *Chapter 2 of this FEIS presents a historical discussion of the alternatives development process, which began in 1990. Section 2.6 of this FEIS examines the Parallel Bridge Corridor with NC 12 Maintenance alternatives and discusses the reasons for the elimination of specific alternatives and the reasons for retaining three alternatives for detailed evaluation in the SDEIS. These two alternatives, however, were not selected as the Preferred Alternative for the project.*

Comment: “This project will impact the following CAMA Areas of Environmental Concern: Estuarine Waters; Coastal Wetlands; Estuarine Shorelines; Public Trust Areas; Ocean Erodible Area; High Hazard Flood Area; Inlet Hazard Area; and Unvegetated Beach Area. Therefore, this project will require a CAMA major permit. A formal DCM review of the project to determine consistency with the state’s Coastal Management Program cannot occur until a CAMA major permit application is received. At that time, the CAMA major permit application will be circulated to the network of state agencies that comprise North Carolina’s Coastal Management Program. The statutes, rules and policies of each of these agencies must be considered during the review of the CAMA permit application. The consideration and incorporation by NCDOT of the comments contained within this letter should help to expedite the CAMA major permit application review process. However, due to the complexity of the project and the extent of environmental impacts that are proposed, NCDOT is urged to submit the CAMA major permit application for this project to DCM a minimum of one year prior to the anticipated construction let date.

During the CAMA major permit application review process, DCM may have additional comments after examining the more detailed environmental information that will be provided with the permit application. DCM may also place conditions on any CAMA permit that is issued to minimize environmental impacts. The information provided in this letter shall not preclude DCM from requesting additional information throughout the CAMA major permit application review process, and following normal permitting procedures.”

Response: *NCDOT will submit the CAMA permit application as early as possible given the urgency to replace Bonner Bridge.*

Comment: “All of the alternatives appear to be consistent with/not in conflict with the Dare County 1994 Land Use Plan approved by the Office of Coastal Resource Management (OCRM) on 4/30/99 and the Dare County 2003 Land Use Plan certified by the Coastal Resources Commission (CRC) on 7/24/03.”

Response: *This position is acknowledged. No response is needed.*

Comment: “Wetland exchange (converting one wetland type to another wetland type of higher functional value) is mentioned as a potential mitigation option if sufficient onsite mitigation is not available. This is not an acceptable form of wetland mitigation. The type of wetland that exists at a given site is tied to the particular hydrologic properties of the site. Also, while one type of

wetland may perform some functions more than another type of wetland, it is not really possible to compare the overall wetland function of different wetland types, as different types of wetlands inherently perform different functions. Wetland enhancement credit should be reserved for instances where degraded wetland functions are restored, not for conversion of wetlands from one type to another. If sufficient onsite mitigation is not available, additional mitigation should be found off-site. Off-site mitigation should consider the Outer Banks area to ensure that the restored wetlands replace the impacted resources. Given the intense development pressure on the Outer Banks, preservation may be a reasonable off-site mitigation option for 404 wetlands. Preservation is not an acceptable form of mitigation for CAMA Coastal Wetlands.

Without a detailed mitigation plan, it is difficult to comment on the adequacy of the proposed mitigation. Based on the descriptions provided in the SDEIS, the existing bridge approach and ferry access road, ditched wetlands on Bodie Island, and removal of Bodie Island dike trail all seem to be reasonable mitigation options. Eradication of the *Phragmites* stands in the Pea Island National Wildlife Refuge for wetland enhancement credit is a promising option, but there remains the issue of who will maintain the site over time to ensure that *Phragmites* does not become re-established. However, NCDOT should be required to establish a long-term maintenance fund to treat the *Phragmites* if it does become re-established.

If NCDOT decides to use the Ecosystem Enhancement Program to satisfy part or all of the mitigation requirements, strong coordination with appropriate resource agencies is strongly encouraged to ensure that the mitigation efforts adequately offset losses.”

Response: *During the permitting phase of the project, Concurrence Points 4B (30 percent hydraulics review) and 4C (permit drawings review) of the NEPA/Section 404 merger process, NCDOT will investigate on-site mitigation opportunities throughout the area. NCDOT will coordinate with the NC Department of Environment and Natural Resources’ Ecosystem Enhancement Program (NCDENR-EEP) for off-site stream and wetland mitigation where on-site mitigation is not practicable.*

Comment: “DCM is very concerned about public trust usage of the lands and waters within Pea Island National Wildlife Refuge. If either of the Pamlico Sound Bridge Corridor alternatives is selected as the LEDPA, then NCDOT and the United States Fish and Wildlife Service (USFWS) should develop an acceptable plan for maintaining public access to the lands and waters within Pea Island National Wildlife Refuge.”

Response: *Neither Pamlico Sound Bridge Corridor alternative was selected as the Preferred Alternative. The Phased Approach/Rodanthe Bridge Alternative (Preferred), when completed, will allow for two points of access inside the Refuge. Since construction of the project would be phased, USFWS would have an opportunity to carefully consider and implement additional access opportunities.*

Comment: “DCM is also concerned about potential impacts to public trust usage in the Pamlico Sound if either of the Pamlico Sound bridge corridors is selected as the LEDPA. If either of the Pamlico Sound Bridge Corridor alternatives is selected as the LEDPA, then the design of the Pamlico Sound Bridge causeway should be modified to create some sections that are higher than 10 feet above mean high water level. This is necessary to allow for passage of traditional vessels (commercial and recreational) that cannot navigate under the planned 10- foot vertical clearance above mean high water level. The number, frequency and dimensions of these navigational passageways should be decided by the NEPA 404 project team during the avoidance and minimization discussion if either of the Pamlico Sound Bridge Corridor alternatives is selected as the LEDPA.”

Response: *Neither of the Pamlico Sound Bridge Corridor alternatives was selected as the Preferred Alternative. The Pamlico Sound Bridge Corridor would have included a navigation zone that is longer than existing Bonner Bridge's navigation zone. The navigation zone for the Pamlico Sound Bridge Corridor would be 1,600 to 2,000 feet (488 to 610 meters) long. In that zone, the minimum navigation opening would be 200 feet (61 meters) horizontally and 75 feet (23 meters) vertically. If this alternative had been selected as the Preferred Alternative, NCDOT would have revisited the proposed bridge height in the non-navigation areas based on this comment.*

Comment: “The two Pamlico Sound Bridge alternatives have a limited amount of direct wetland impacts, with most impacts occurring to wetlands that are already man-dominated. It is not apparent that any indirect impacts to wetlands would occur as a result of construction of the bridge through the Pamlico Sound Bridge Corridor. Of the two alternatives, the Intersection Rodanthe Terminus is preferable because it has fewer overall wetland impacts, but the difference between the two alternatives is relatively small.

DCM is especially concerned about the 8 miles of dredging that is proposed for construction of the Pamlico Sound Bridge Corridor. Detailed information assessing the dredging impacts to shallow water habitats, shellfish beds, sub-aquatic vegetation (SAV) habitat and other estuarine resources was not provided in the document. There was also limited discussion on where the extremely large amount of excavated material would be placed and any potential impacts to estuarine or ocean resources which could occur from its disposal.”

Response: *Neither of Pamlico Sound Bridge Corridor Alternatives was selected as the Preferred Alternative. Additional information on aquatic impacts is included in an Essential Fish Habitat Assessment (CZR, Incorporated, 2008). Potential sites for the disposal of excavated material are discussed in Section 4.13.5 of the SDEIS and the FEIS. The nondiscretionary measures outlined in the Biological and Conference Opinions (USFWS, 2008) for the Phased Approach/Rodanthe Bridge Alternative (Preferred) related to piping plovers specify that “all dredge spoil excavated for construction barge access must be used to augment either existing dredge-material islands or to create new dredge-material islands for use by foraging plovers. This must be accomplished as per the specifications of the North Carolina Wildlife Resources Commission.” The NCDOT is committed to implementing this measure.*

Comment: “Beach nourishment may also be a viable alternative. However, the viability of the Parallel Bridge Corridor with Beach Nourishment alternative is limited by available beach compatible sand that is in reasonable proximity to the project study area. The viability of this alternative is also limited by the potential for significant adverse impacts to ocean resources. While the document mentioned that there may be adequate and compatible sand sources close by, there has been no detailed investigation provided. Therefore, DCM must question the practicability of this alternative without the assurance that adequate amounts of beach compatible sand resources will be available to sustain the 50-year life of this project. Sand availability could be even more limited when considering that many municipalities along the oceanfront sections of Dare County are also actively pursuing beach nourishment projects of their own.”

Response: *The Nourishment Alternative was not selected as the Preferred Alternative. If it had been selected as the Preferred Alternative, additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.10.2.1 of the FEIS pertaining to available and suitable sand sources would have been sought.*

Comment: “In addition, beach nourishment projects can have significant negative impacts on the flora and fauna of the coastal ecosystem. For example:

- 1) If the renourishment cycles are too close together temporally and/or spatially, flora and fauna may not be able to adequately repopulate the nourished areas between nourishment events. This can lead to a “sterile” beach that is impoverished of its typical biodiversity;
- 2) If the sand resource is not compatible with the native beach material in grain size and/or color, sea turtles may not have suitable nesting habitat, the proportion of male vs. female sea turtle hatchlings may be altered, and shorebirds may not be able to find adequate amounts of invertebrates for food; and
- 3) Although a single beach nourishment project may not have a significant adverse effect on the beach ecosystem, there may be a significant adverse effect when cumulative and secondary impacts of other beach nourishment projects in the vicinity are considered.”

Response: *A nourishment alternative was not selected as the Preferred Alternative. The four-year nourishment cycle defined in Section 2.8.2.1 of the SDEIS and Section 2.10.2.1 of the FEIS was selected taking into consideration the first point. The need for biologically compatible sand was assumed. If a nourishment alternative had been selected as the Preferred Alternative, additional detail on its characteristics would have been developed, including gathering additional data on the availability of biologically compatible sand.*

Comment: “The amount of wetlands that would be impacted by the Parallel Bridge Corridor with Beach Nourishment alternative would be similar to the two Pamlico Sound Bridge Corridor alternatives. By maintaining NC Highway 12 at its current location, this alternative would not come into direct conflict with the high quality wetland resources contained within the Pea Island National Wildlife Refuge. If the Parallel Bridge Corridor with Beach Nourishment alternative is selected as the LEDPA, then the NEPA/404 project team will need to find a way to substantially avoid and minimize the impacts of beach nourishment.”

Response: *Comment acknowledged. A nourishment alternative was not selected as the Preferred Alternative.*

North Carolina Department of Environment and Natural Resources-Division of Coastal Management-April 11, 2007 (page A-41)

Comment: “A formal DCM review of the project to determine consistency with the state’s Coastal Management Program cannot occur until a CAMA major permit application is received. At that time, the CAMA major permit application will be circulated to the network of state agencies that comprise North Carolina’s Coastal Management Program. The statutes, rules and policies of each of these agencies must be considered during the review of the CAMA permit application. The consideration and incorporation by the N.C. Department of Transportation (NCDOT) of the comments contained within this letter should help to expedite the CAMA major permit application review process. However, due to the complexity of the project and the extent of environmental impacts that are proposed, NCDOT is urged to submit the CAMA major permit application for this project to DCM a minimum of one year prior to the anticipated construction let date.

During the CAMA major permit application review process, DCM may have additional comments after examining the more detailed environmental information that will be provided with the permit application. DCM may also place conditions on any CAMA permit that is issued to minimize environmental impacts. The comments provided in this letter shall not preclude DCM from requesting additional information throughout the CAMA major permit application review process, and following normal permitting procedures.”

Response: *Comment acknowledged. NCDOT will submit the CAMA permit application as early as possible given the urgency to replace Bonner Bridge.*

Comment: “All of the alternatives being studied for TIP No. B-2500 will impact CAMA Areas of Environmental Concern (AECs). Therefore, any alternative that is selected as the LEDPA will require a CAMA major permit. It is possible that the location of such a massive, permanent structure like the Bonner Bridge and NC Highway 12 within the Outer Banks coastal ecosystem could prevent any of the alternatives being studied for TIP No. B-2500 from complying completely with the rules of the N.C. Coastal Resources Commission (CRC). Therefore, it is possible that DCM will need to deny a CAMA permit application for any of the alternatives for procedural reasons. DCM will work closely with the NEPA/404 Project Team to ensure that whatever alternative is selected as the LEDPA complies with the rules of the CRC to the maximum extent practicable. DCM’s concurrence with the selection of a LEDPA will indicate that DCM will support that alternative if the CAMA permit must be denied, and the permit application needs to go before the CRC for a variance. ...”

Response: *Position and need to comply with CAMA process are acknowledged, including if needed the process of seeking a variance. Note that the Phased Approach/Rodanthe Bridge Alternative (Preferred) does not include beach nourishment.*

Comment: “Based upon the information provided within the 2007 Supplement, the Parallel Bridge Corridor Phased Approach/Rodanthe Bridge and Parallel Bridge Corridor Phased Approach/Rodanthe Nourishment Alternatives both are consistent with/not in conflict with the Dare County 1994 Land Use Plan approved by the Office of Coastal Resource Management (OCRM) on 4/30/99 and the Dare County 2003 Land Use Plan certified by the CRC on 7/24/03.”

Response: *This position is acknowledged. No response is needed.*

Comment: “DCM is very concerned about public trust usage of the lands and waters within the project area. Public trust usage such as navigation and recreation within Pamlico Sound, Oregon Inlet and the Atlantic Ocean, fishing opportunities at Oregon Inlet and access to the lands and waters within Pea Island National Wildlife Refuge will be important considerations when selecting a LEDPA. As much as possible, public trust usage should be accommodated in the alternative designs before a LEDPA is selected.”

Response: *This concern is acknowledged. Impacts to recreation opportunities in the Pamlico Sound, Oregon Inlet, and the Atlantic Ocean are addressed in Sections 4.5.3.2 and 4.5.4 of the SDEIS, Sections 4.5.3.2, 4.5.3.3, and 4.5.4 of the SSDEIS, and this FEIS.*

Comment: “The 2007 Supplement and 2005 SDEIS do not provide a concise summary and comparison of all temporary and permanent impacts to biotic communities between all of the alternatives under consideration in a format that allows the reviewer to readily make comparisons between the alternatives. The package of information that is provided to the NEPA/404 Project Team prior to the LEDPA meeting should include a concise summary and comparison of all

temporary and permanent impacts to biotic communities between all of the alternatives under consideration, including but not necessarily limited to fill, pile placement, excavation and shading. This should include construction impacts; including impacts to the beach nourishment borrow site(s) and dredging disposal sites.”

Response: *Tables 4-9 and 4-10 of the SDEIS and Table 4-1 of the SSDEIS, which summarize impacts to biotic communities, are combined in the FEIS.*

Comment: “Developing suitable compensatory mitigation for the impacts to wetlands and waters of the State, including SAV, will likely be a challenging undertaking for the mitigation provider. Close coordination between the mitigation provider and NCDOT, DCM, the N.C. Division of Water Quality (DWQ), the N.C. Division of Marine Fisheries (DMF), the N.C. Wildlife Resources Commission (WRC), the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA) and other interested state and federal agencies is strongly encouraged.”

Response: *NCDOT will coordinate with the above referenced agencies regarding compensatory mitigation within the context of Concurrence Points 4B (30 percent hydraulics review) and 4C (permit drawings review) of the NEPA/Section 404 merger process.*

Comment: “Like the Parallel Bridge Corridor Nourishment Alternative, the viability of the Parallel Bridge Corridor Phased Approach Rodanthe Nourishment Alternative is limited by available beach compatible sand that is in reasonable proximity to the project study area. The viability of both alternatives is also limited by the potential for significant adverse impacts to ocean resources. The 2007 Supplement does not demonstrate that there are adequate and compatible sand sources close by to accomplish the proposed nourishment for the Parallel Bridge Corridor Phased Approach/Rodanthe Nourishment Alternative every 4 years for the 50-year life of this project.”

Response: *As was assumed for the Nourishment Alternative, additional surveys for suitable nourishment sand would have been conducted had this alternative been selected as the Preferred Alternative. A nourishment alternative was not selected as the Preferred Alternative.*

Comment: “On Page 2-10, the 2007 Supplement states that: “The estimated amount of sand needed for the Phased Approach/Rodanthe Nourishment Alternative if nourishment begins in 2007 is 2.3 million cubic yards for the first cycle of nourishment, and 1.5 million cubic yards every four years throughout the life of the project (through 2060).” DCM does not understand with the current project timeline how nourishment would begin in 2007. This should be further explained by NCDOT.”

Response: *An initial cycle of nourishment was incorporated because of the severity of shoreline erosion within Rodanthe. However, interim measures, including sandbag placement and dune reconstruction, completed by NCDOT (with the cooperation of the Refuge) have negated the need for this first cycle of nourishment. The reference to nourishment beginning in 2007 is removed from the FEIS.*

Comment: “DCM is concerned that the successful implementation of the Parallel Bridge Corridor Phased Approach/Rodanthe Bridge and Parallel Bridge Corridor Phased Approach/Rodanthe Nourishment Alternatives may be too dependent upon the estimated position of the ocean shoreline through the year 2060. Short-term erosion events should be considered when looking at the worst-case scenario shorelines in addition to long-term erosion rates.”

Response: *The high erosion rate used to define the Phased Approach alternatives (including the Preferred Alternative) is the best available information upon which to predict today the timing of the implementation of the various phases and is the same rate used to define the other Parallel Bridge Alternatives. Additional information related to shoreline monitoring and adapting the timing of the NC 12 phases to actual conditions as the shoreline evolves are presented in Section 2.10.2.5 of this FEIS.*

Comment: “A permanent bridge that is constructed in a location that is projected to be in the ocean during the bridge’s lifespan will be exposed to significant wave energy. While this design may be technically feasible, it does not appear to be practicable.”

Response: *Technical feasibility means that design and construction of the Phased Approach (including the Preferred Alternative) physically can be performed under the constraints prescribed. Conventional construction techniques are available for heavy/highway contractors to use to build these bridges while maintaining traffic, remaining inside of the existing right-of-way, and not substantially affecting areas of SAV or wetlands, etc. The project constraints present unique complexities to the construction of the project. However, it is known that these complexities can be effectively addressed. Further explanation of construction techniques is provided in Section 2.10.2.4.*

Comment: “Prior to selecting a LEDPA, DCM would like to know how the bridges for all of the alternatives under consideration will be disposed of when they have reached the end of their service life. Prior to selecting a LEDPA, DCM would also like to know the estimated life spans for the bridges of all of the alternatives under consideration. The bridge life spans, and possibly the future disposition plans, may have a strong impact on the long-term cost effectiveness of the alternatives under consideration.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years, although bridge structure components of the alternatives could potentially last longer than 50 years. A discussion of the disposal of the proposed bridge when it has reached the end of its service life is presented in Section 2.11.3 of this FEIS.*

Comment: “DCM looks forward to working with the NEPA/404 Project Team to select a LEDPA for this critically important transportation project as soon as possible. NCDOT is strongly encouraged to coordinate closely with all of the NEPA/404 Project Team members in advance of the NEPA/404 Project Team LEDPA meeting to ensure that all of the information that is needed to select a LEDPA is available prior to the meeting.”

Response: *NCDOT provided information needed to select a LEDPA prior to the associated NEPA/Section 404 Merger Team meetings. The three LEDPA-related Merger Team Meetings are described in Sections 8.10.1.1, 8.10.1.2, and 8.10.1.3.*

Comment: “As stated in the 1/20/06 DCM letter, it appears as though the Parallel Bridge Corridor with Road North/Bridge South Alternative and the Parallel Bridge Corridor with All Bridge Alternative are the least preferred alternatives due to significant impacts to the CAMA Coastal Wetlands AEC. We therefore continue to recommend that these two alternatives be dropped from further consideration so that the additional time and effort needed to prepare for the LEDPA meeting can be focused on the remaining alternatives under consideration.”

Response: *The Parallel Bridge Corridor with Road North/Bridge South and the Parallel Bridge Corridor with All Bridge alternatives were not selected as the Preferred Alternative.*

Comment: “When the NEPA/404 Project Team selects a LEDPA, the participants should be reasonably sure that the design features necessary to successfully implement all of the alternatives under consideration have been incorporated into each of the alternative designs to the same level of detail. Design features that should be incorporated into the alternative designs prior to selection of a LEDPA, if this can be accomplished in a timely manner, include, but are not necessarily limited to: (1) vertical clearance of bridges; (2) implementation of AASHTO/FHWA Joint Wave Task Force interim guidance for quantifying wave forces on bridges, structural design approaches for wave forces, and deployment of countermeasures for existing bridges; (3) bridge foundation assumptions; (4) implementation of mechanisms identified by the physical modeling of the hydraulics of the Oregon Inlet area for mitigating the risk of erosion and inlet formation; and (5) construction methodologies. If this information is not available prior to the scheduled NEPA/404 Project Team LEDPA meeting, then the NEPA/404 Project Team should make an informed decision whether to wait until more information is available, or whether to proceed with the selection of a LEDPA with the best available information at the time.”

Response: *Design features presented in the SDEIS and the SSDEIS, supplemented by responses to questions asked by the NEPA/Section 404 Merger Team during their meetings to discuss the LEDPA were adequate to select the LEDPA. The three LEDPA-related Merger Team Meetings are described in Sections 8.10.1.1, 8.10.1.2, and 8.10.1.3.*

Comment: “As stated in the 1/20/06 DCM letter, the transportation link that the Herbert C. Bonner Bridge provides between Hatteras Island and Bodie Island is a critical component in the safety of the residents and visitors of Hatteras Island and Ocracoke Island, and the economic vitality of the Outer Banks. Given the importance of this transportation link and the advancing age of the existing Bonner Bridge, DCM continues to urge DOT to move expeditiously towards the development of a final project design that satisfies the transportation needs of the residents and visitors of Bodie, Hatteras and Ocracoke Island, while also ensuring that coastal resources are adequately protected.”

Response: *NCDOT will continue to move expeditiously towards the development of a final project design that satisfies the transportation needs of the residents and visitors of Bodie, Hatteras and Ocracoke Island, while also ensuring the coastal resources are adequately protected.*

North Carolina Department of Environment and Natural Resources-Division of Marine Fisheries-January 13, 2006 (page A-44)

Comment: “The major factors in determining the range of bridge alternatives which can be considered for this project are dependent on a Compatibility Determination under the National Wildlife Refuge System Improvement Act of 1997. The SDEIS states, “The USFWS

compatibility determination will be presented in the Final EIS.” Potential delays in obtaining a decision concerning compatibility may lead to project delays.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement for which NCDOT has a permit, so a compatibility determination is not required. The Phased Approach is consistent with the original purpose of the permanent easement.*

Comment: “The Pamlico Bridge corridor contains a proposed bridge that would be approximately 17.5 miles long, with approaches, a total length of approximately 18 miles. About 8 miles of dredging would be needed for construction of this bridge. Waters with depths less than 6 ft would need to be dredged to 8 ft. The SDEIS indicates that dredging would be restricted to shallow portions of alignment near Rodanthe and Bodie Island. Another section indicates that a work bridge on the Bodie Island side would be constructed over marsh and SAV areas. In previous meetings and documents, resource agencies were told that barges could be utilized in waters with a depth of 6 ft. or more. Thus, the Pamlico Sound Bridge alignment is proposed outside the SAV areas, which are in depths less than 6 ft. Approximately one mile of the area near Rodanthe contains SAVs and a work bridge is proposed in this area. A current SAV survey map is greatly needed with the proposed alignment overlaid to truly assess impacts. Existing water depths must be supplied along the proposed alignment to determine areas that will require dredging. An important question is that if a 6 ft. depth is adequate for the barges, why is there proposed dredging to an 8 ft. depth?”

Response: *The SDEIS and SSDEIS relied on available sources of information on SAV locations. The Pamlico Sound Bridge Corridor was placed at depths in Pamlico Sound that reduced the likelihood of SAV impacts. Detailed SAV surveys would have been conducted to identify SAV locations more specifically had the Pamlico Sound Bridge Corridor been selected as the Preferred Alternative. The proposed dredging to an 8 foot depth is needed to reduce the frequency of re-dredging as the channel naturally fills in.*

Comment: “The proposed vertical clearance outside the navigation system (75 ft) is only 10 ft. This height would result in a hazard to navigation for boats passing under the bridge. We recommend a greater clearance above the normal water level for the entire bridge outside the main navigation areas near Oregon Inlet or at least periodically along the bridge length, including near the southern terminus at Rodanthe.”

Response: *This comment is referring to the Pamlico Sound Bridge Corridor Alternative. This alternative was not selected as the Preferred Alternative. If this alternative had been selected as the Preferred Alternative, NCDOT would have revisited the proposed bridge height in the non-navigation areas based on this comment.*

Comment: “The document indicates that spoil from dredging would be placed in an in-water borrow sites. Where exactly are these located? What surveys have been conducted to determine the least damaging locations for these sites?”

Response: *Section 4.13.5 of both the SDEIS and the FEIS discusses potential waste disposal sites. Final decisions on waste disposal sites will be done during the permitting phase. The nondiscretionary measures outlined in the Biological and Conference Opinions (USFWS, 2008) for the Phased Approach/Rodanthe Bridge Alternative (Preferred) related to piping plovers specify that “all dredge spoil excavated for construction barge access must be used to augment either existing dredge-material*

islands or to create new dredge-material islands for use by foraging plovers. This must be accomplished as per the specifications of the North Carolina Wildlife Resources Commission.” The NCDOT is committed to implementing this measure.

Comment: “The Pamlico Sound Bridge Corridor will be west of Oregon Inlet, resulting in less sand movement. This would probably reduce the amount of dredging required.”

Response: *As noted in Section 4.6.4 of the SDEIS and the FEIS, “A replacement bridge within either of the replacement bridge corridors would make navigation channel dredging operations easier to undertake and could reduce the frequency and size of dredging operations from what is required today.”*

Comment: “The [Pamlico Sound Bridge] corridor depending on the termini, would permanently affect 10.8-12.8 acres of biotic communities, yet it would result only in the loss of 0.01 acres of coastal wetlands. Please explain this great difference between permanent effects and actual loss.”

Response: *Section 4.7.3 of the FEIS discusses the impacts on the biotic communities. Within the construction limits of the Pamlico Sound Bridge Corridor alternatives, there are several types of biotic communities (habitat), which are detailed in Table 4-10. In total, the Pamlico Sound Bridge Corridor depending on the termini, would permanently affect a total of 10.8 to 12.8 acres (4.4 to 5.2 hectares) of habitat. Of these total acreages only 0.01 acre (less than 0.01 hectare) is coastal wetlands, which include smooth cordgrass and wetland black needlerush communities.*

Comment: “The Parallel Bridge would be located west of the existing bridge and be approximately 2.7 miles in length. A vertical clearance of 75 ft. throughout the structure length would exist. In one section of the document a dredged channel is indicated behind Bodie Island that would be 120 ft wide with a depth of 10 ft. The channel would likely require continuous dredging with material placed in an in-water disposal site (Would this be a new long-term site?) or used for beach nourishment, if appropriate. In another area of the document a haul road is indicated. To the north of Hatteras Island an area approximately 2000 ft long is proposed for dredging, including approximately 5.5 acres. Current SAV coverage and water depths should be provided for the area with the alignment overlaid for agencies’ review.”

Response: *During construction, the channel would likely require continuous dredging with material placed in an in-water disposal. Dredge disposal would only be needed during construction. NCDOT surveys in 2007 indicate that about 25 percent of the open water area affected behind Bodie Island includes SAVs. No SAVs are in Oregon Inlet or in the area where the replacement bridge would approach Hatteras Island.*

Comment: “The Parallel Bridge, with Road North/Bridge South would result in the loss or impact of 78.2 acres of wetlands, with 11.8 acres being coastal wetlands. The All Bridge alternative would fill 12.3 acres of wetlands, of which, 2.2 acres are coastal wetlands. These two alternatives would result in 1.4 acres of SAVs being filled, this agency would not support either of these alternatives due to the loss/impact to wetlands and SAVs.”

Response: *The Parallel Bridge Corridor with Road North/Bridge South and All Bridge alternatives were not selected as the Preferred Alternative.*

Comment: “The Parallel Bridge with the Nourishment would impact a total of 4.3 acres of wetlands and coastal wetlands account for 0.3 acres of the total. Beach nourishment every four years would result in re-occurring impacts to the near shore biotic community, including numerous species of economically important fishes and their prey. Are adequate borrow sites now available for 50 or more years of nourishment? Exactly where are the sites located? Several sites offshore have been identified as borrow sites for other projects. Adequate analysis of sand compatibility must occur, with results presented for agencies’ review.”

Response: *The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative. The best available information pertaining to the analysis of sand compatibility was used in the SDEIS and the SSDEIS. Had an alternative involving nourishment been selected, surveys would have been done to confirm suitable sand availability before finalizing a selection.*

Comment: “A comprehensive table with Pamlico Sound and Parallel Bridge alternatives needs to be included in the document to assess impacts and costs.”

Response: *Although the impacts and costs for the Pamlico Sound and Parallel Bridge Alternatives are not in tabular form, the impacts and costs are summarized for all alternatives in Section 6 of the Summary of the SDEIS, SSDEIS, and the FEIS.*

Comment: “The Division of Marine Fisheries has indicated in previous comments on this project that some type of fishing access must be maintained at the north end of Hatteras Island to provide anglers with the reasonable opportunities to fish local waters for sport fishing, including parking comparable to that which currently exists. This is an extremely important area utilized by recreational fishermen on a year round basis. The EIS will not be adequate unless this issue is satisfactorily addressed.”

Response: *NCDOT will examine opportunities for continued recreational access during the final planning and design of the Phased Approach/Rodanthe Bridge Alternative (Preferred) (see Section 2.10.1.2 of the FEIS).*

Comment: “The DMF has previously indicated that the Bonner Bridge demolition materials could be used for artificial reef material. The Division requests that suitable (uncontaminated) material be made available to the agency for artificial reef material as a condition of the contract for the Bonner Bridge demolition. Costs for loading, transport and offloading on the designated reef site should also be included in the contract.”

Response: *Suitable material can be provided for artificial reef material. The NCDOT will work with the Division of Marine Fisheries to accommodate this desire during demolition planning.*

Comment: “The SDEIS mentions that a partial top down construction technique is possible for some construction. This agency suggests that serious consideration be given to this technique to minimize the impacts to aquatic and wetlands habitats, particularly with the Pamlico Sound Bridge Corridor.”

Response: *A partial top down construction technique is not possible with the Oregon Inlet Bridge component of the Phased Approach/Rodanthe Bridge Alternative (Preferred) because of the size of the components and the length of bridge spans (see Section 2.8.1.3*

of the SDEIS and Section 2.10.1 of the FEIS). The NC 12 maintenance component will be built on land, not over water, with limited wetland impacts.

North Carolina Department of Environment and Natural Resources-Division of Marine Fisheries-March 20, 2007 (page A-46)

Comment: “As the Division indicated in previous comments (January 13, 2006), all of the alternatives have environmental issues/consequences. Issues and concerns expressed by the Division in the January 13, 2006 memo would also apply to these alternatives.”

Response: *This was assumed in answering comments in the 2006 letter.*

North Carolina Department of Environment and Natural Resources-Division of Water Quality-January 18, 2006 (page A-47)

Comment: “It is unclear what the source will be for the sand required for beach nourishment under the Parallel Bridge - Nourishment Alternative. Not only is the quantity of sand in question but also the quality of sand. Fine particles from non-suitable sand can change the physical habitat of the beach face and swash zones and choke out the invertebrate population. To some extent, this has already occurred in the Refuge due to beach renourishment using sand dredged from the Oregon Inlet.

The SDEIS states that sand dredged from the Oregon Inlet could be used to nourish the beaches of the Refuge. Dredging from the Oregon Inlet is not a reliable sand source. The quality of the dredged sand from the inlet may change and may not be suitable for nourishment of the Refuge beaches over the life of the project. Using unsuitable sand would be detrimental to the Refuge due to the negative impacts on the invertebrate population which is the primary food source of the migratory bird population within the Refuge. In addition, US Fish and Wildlife would not allow sand that does not meet the Refuge standards to be deposited on the Refuge beaches. To that end, the uncertainty of the potential water quality impacts associated with dredging operations for additional sand sources should be considered. Please provide additional information that details the locations of sand sources for beach nourishment.”

Response: *An alternative involving nourishment was not selected as the Preferred Alternative. The best available information pertaining to the analysis of sand compatibility was used in the SDEIS and the SSDEIS. It was assumed that sand used in nourishment had to be biologically compatible otherwise it could not be used for nourishment alternatives. Had the Parallel Bridge with Nourishment Alternative been selected, surveys would have been done to confirm compatible sand availability before finalizing a selection of an alternative. In the discussion referenced in the comment regarding use of sand from Oregon Inlet, Section 2.8.2.1 of the SDEIS and Section 2.10.2 of the FEIS discuss the use of sand from the Corps of Engineers ocean bar dredging and not from its dredging of the inlet. It was assumed that if sand dredged from the ocean bar were not biologically compatible, then it would not be used with the nourishment alternatives.*

Comment: “Barrier Islands are dynamic ecosystems as clearly shown in the SDEIS in Figures 3-4 and B-1(a-g). Considering this fact, DWQ has some concerns about the potential impacts to water quality with an alternative that will require intensive maintenance either through nourishment or road relocation. Alternatives that include road sections along similar or parallel alignments would continually face the challenges of beach nourishment, protection and

stabilization, as well as the added costs of repairs and clearing due to overwash during storm events. Over the last 16 years, DOT has spent approximately \$32 million dollars in maintenance to this section of NC 12 due to overwash and erosion from hurricanes and major storms. This does not include maintenance costs for clean up from minor storms.”

Response: *All alternatives were developed as long term solutions, and as such continued intensive maintenance of NC 12 would not be needed. Maintenance of NC 12 would continue with the Phased Approach/Rodanthe Bridge Alternative (Preferred) until all phases are completed. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.*

Comment: “It is unclear from the Section 4(f) discussion in Section 5.0 how no direct adverse impacts would occur as a result of the Parallel Bridge - Nourishment alternative. It is our understanding, that any fill outside the existing right-of-way could result in an adverse impact, and Section 5.2.2, page 5-23 states that new right-of-way would be required for the Nourishment alternative. Please clarify the section 4(f) discussion to address this apparent inconsistency.”

Response: *An alternative involving nourishment was not selected as the Preferred Alternative. Nourishment would use land from the Refuge (a Section 4(f) resource). The summary statement referenced on page 5-23 of the SDEIS, should have noted the placement of sand outside of the right-of-way, which is discussed later in the section.*

Comment: “USFWS issued a permit to DOT to construct a groin at the north end of Hatteras Island to secure the bridge approach for the Bonner Bridge. This permit was issued strictly for the current bridge alignment. If the bridge approach is moved to a different location, then a new permit would need to be issued for any bridge approach located within the Refuge boundaries. It is unclear whether USFWS would issue a permit for a new alignment within the Refuge boundaries.”

Response: *The design of the Phased Approach/Rodanthe Bridge Alternative (Preferred) requires the groin to remain in place. NCDOT will seek a permit to maintain the groin if requested by USFWS. FHWA and NCDOT recognizes that the selection of the Phased Approach/Rodanthe Bridge Alternative (Preferred) does not guarantee that a new permit for the terminal groin would be issued.*

Comment: “Tables 4-11 and 4-12 are confusing. Impact comparisons should simply be shown as the “Shading” and “Fill and Pile” impacts for SAVs and wetlands. Although the breakout of the different wetland types is useful information, for the purposes of alternative comparison the impacts should be provided in an additional table that displays in a less complex format the impacts to wetlands and SAVs.”

Response: *Tables 4-23 and 4-24 were revised in the FEIS based on this suggestion.*

Comment: “The SDEIS states that dredging may be required to maintain a work channel of 8 feet in depth for work barges. It is the understanding of DWQ that the typical depth needed for work barge operation is six feet. Why is an additional 2 feet of depth required for this project? Please clarify this issue.”

Response: *The proposed extra depth is needed to reduce the frequency of re-dredging as the channel naturally fills in during project construction.*

Comment: “As shown in the table below, the Parallel Bridge - All Bridge alternative and the Parallel Bridge - Road North/Bridge South alternative have the most fill and pile impacts of the alternatives. The impacts associated with the All Bridge alternative would be almost three times the amount of impacts associated with the two Pamlico Sound alternatives and the Parallel Bridge - Nourishment alternative. The impacts associated with the Road North/Bridge South alternative would be over 17 times the amount of impacts associated with the two Pamlico Sound alternatives and the Parallel Bridge - Nourishment alternative. Based on these impacts, DWQ believes issuance of a 401 Water Quality Certification for the Parallel Bridge - All Bridge and the Parallel Bridge - Road North/Bridge South alternatives would be extremely problematic, at best, and likely unpermittable, at worst.”

Alternative	Fill and Pile Impacts
Parallel – All Bridge	12.33 acres
Parallel – Road N/Bridge S	78.15 acres

Response: *The Parallel Bridge Corridor with All Bridge and the Parallel Bridge Corridor with Road North/Bridge South alternatives were not selected as the Preferred Alternative.*

Comment: “It is not clear how the “shading” impacts of wetlands for the project were calculated. Please provide clarification on how the shading impacts were determined. Specifically, please provide the shading impacts as those associated with direct construction and those associated with the long term effects of the bridge.”

Response: *Shading is the area of the bridge deck and is a long-term effect of the bridges. In general, the bridge deck for alternatives is approximately 40 feet (12.2 meters) wide.*

Comment: “The discounted cash-flow method used to present future costs in present day values needs to be described in greater detail. It is unclear why this assessment is being presented. DWQ cannot recall ever having seen this assessment presented in any other DOT projects. Moreover, the manner in which the numbers were calculated needs to be described in greater detail.”

Response: *Discounting is described in Section 2.6.3.3 of the SDEIS and Section 2.12 in the FEIS under “cost.” The discounted cost, although important to know, did not prove to be a contributing factor to the selection of the Preferred Alternative.*

Comment: “In accordance with the Environmental Management Commission’s Rules {15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream or greater than one acre of wetlands. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the Environmental Management Commission’s Rules {15A NCAC 2H.0506 (h)(3)}, the NC Ecosystem Enhancement Program may be available for use as stream and wetland mitigation. A discussion of potential mitigations strategies should be included in the SDEIS.”

Response: *Potential mitigation strategies are discussed in Section 4.7.8.3 of the SDEIS and Section 4.7.10.3 of the FEIS.*

Comment: “The 401 Water Quality Certification applications will need to specifically address the proposed methods for storm water management. More specifically, it is suggested that storm water not be permitted to discharge directly into streams or surface waters.

For all bridges on the project, bridge deck drains should not discharge directly into the stream. Storm water should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to NCDOT Best Management Practices for the Protection of Surface Waters.”

Response: *Additional material related to water quality impacts and on the approaches to handling storm water on the bridges is included in Section 4.7.2 of the FEIS. NCDOT’s Best Management Practices for the Protection of Surface Waters will be implemented.*

Comment: “If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.”

Response: *Test borings are needed and appropriate permits will be obtained.*

Comment: “Sediment and erosion control measures should not be placed in wetlands.”

Response: *The position is acknowledged, and it is not NCDOT’s intent to place sediment and erosion control measures in wetlands. All activities will be consistent with NCDOT’s current sediment and erosion control guidelines.*

Comment: “Borrow/waste areas should avoid wetlands to the maximum extent practicable. Impacts to wetlands in borrow/waste areas could precipitate compensatory mitigation.”

Response: *The position is acknowledged and agreed upon per NCDOT’s standard operating procedures.*

North Carolina Department of Environment and Natural Resources-Division of Water Quality- April 11, 2007 (page A-48)

Comment: “Section 2.2.2.2 of the referenced document discusses refuge access by one-lane ramps. It is unclear from the discussion whether the ramps would be constructed within the existing right-of-way or if additional right-of-way would be required. Please indicate if the proposed ramps would fit within the existing right-of-way and if not, whether the US Fish and Wildlife Service has approved additional right-of-way.”

Response: *The proposed ramps, located on the north end of Hatteras Island, would fit within the existing NC 12 easement.*

Comment: “It is unclear from the discussions in the SSDEIS if a bridge in the surf zone has long-term feasibility. Please provide additional information regarding examples of bridges constructed in the surf zone and the long-term effects of the wave action on the bridge as well as the effects of the bridge on the natural resources in the surf zone.”

Response: *There are no known examples of bridges constructed in the surf zone. Additional discussion of the impacts of the bridge when in the surf zone is added to*

Section 4.7 of the FEIS. Section 2.10.1.2 of the FEIS also discusses how the effects of increased wave activity will be taken into account during final design.

Comment: “On page 2-18, the document indicates a 14.9 percent increase in costs identified in the original DEIS. In addition, it identified a 15 percent increase in anticipated costs due to design-build construction being used for the project. Later on the same page, the document indicates that there was an additional 18.7 percent increase (in addition to the extra anticipated costs for design-build). Please clarify the discrepancy.”

Response: *These are two different factors as described in Section 2.3.1.2 of the SSDEIS and Section 2.12.1 of the FEIS. The 15 percent includes 5 percent for design and 10 percent to reflect contractor risk. The 14.9 percent covers inflation from the current time to the estimated mid-point of construction to account for design-build contractor inflation risk. Adding an inflation factor in this way is the design-build cost estimate equivalent of assuming current year (2006) dollars when estimating the cost of a conventional contract delivery project.*

Comment: “As previously discussed, the document identifies an extra 15 percent increase in costs to all the bridge alternatives due to using the design-build construction practices. While the arguments that design-build will cost more due to the fact that DOT will be paying consultants to design the road and that contractors will build in a 10 percent increase in the profit margins to offset risk associated with the project seems reasonable, it is diametrically opposed to every other DOT (and NC Turnpike) project where we have been told that design-build will save both time and money. Please explain this apparent discrepancy.”

Response: *The percents added reflect recent experience with the design-build process and standard procedures now used in estimating the cost of design-build projects.*

Comment: “As previously discussed on page 2-18, the document assumes a 5 percent annual increase in costs for the project. While DWQ agrees that a recent worldwide cyclical boom in commodities has resulted in a significant increase in construction costs recently, it seems unreasonable to assume that trend will continue indefinitely. Review of information provided at the US Federal Reserve Bank’s website indicates that average overall inflation for the entire economy has averaged 2.6 percent over the past 5 years. In addition, the data indicates that inflation has averaged less than 5 percent every year since 1991. The existing long range projections for inflation that the US Federal Reserve Bank projects for the next 3 years averages between 2-3 percent. Based on this information, it seems reasonable an annual inflation factor of 2-3 percent is more appropriate.”

Response: *Five percent is an appropriate assumption of what a design build contractor would presume to cover the risk of inflation. Note that in recent years the inflation of the cost of bridge construction has exceeded the overall national rate of inflation. Since the inflation rate is applied to all alternatives, a different inflation rate would not change the relative differences between the alternatives. A lower inflation rate would not change the affordability of the alternatives.*

Comment: “On page 2-19, the document indicates that previous costs estimates had used an estimated bridge construction cost of \$55 per square foot in the SDEIS in 2005. The document then indicates that present estimates use a construction cost of \$130-\$140 for conventional construction costs, and \$210-\$220 per square foot for segmented construction costs. The document indicates that the previous estimates using \$55 per square foot would be possible

because of economies of scale that could be captured. However, the document fails to discuss what economies specifically were anticipated and why they were no longer valid. Please provide this additional information. It is our understanding that present DOT cost estimates use an amount ranging from \$100- \$115 per square foot. That would seem to be approximately consistent with the lowest cost estimates used in the document, but not as much with the higher estimates. We recognize that the \$100-\$115 estimate is a simple rule of thumb that is not applicable for all projects. However, a discussion on the site-specific issues that are causing the estimates for this project to be higher than for other projects throughout the state would be beneficial.”

Response: *Section 2.3.1.2 of the SSDEIS and Section 2.12.1 of the FEIS summarize in full the changes to the cost assumptions made between the SDEIS and the SSDEIS. The new costs prepared by NCDOT were verified by an independent consultant with bridge construction experience, as well as the FHWA. In the context of the selection of the LEDPA, members of the NEPA/Section 404 Merger Team, including those of the Division of Water Quality, were provided notebooks containing all the cost estimates and their underlying assumptions. NCDOT staff discussed the cost estimates with the Merger Team; the members indicated that their questions related to the cost estimates were satisfactorily resolved.*

Comment: “The document presents a range of cost estimates for this project. However, we are not aware of any other DOT project that used a range of potential costs for analysis in an EIS. Moreover, the reasons given for presenting a range of costs (rather than a single estimate) were very broad and vague in their presentation, and are common uncertainties present in many, if not all, other DOT projects. Project cost is a very important factor that we examine while performing our assessment of impact avoidance and minimization. By presenting a set of alternatives with a very wide range of potential costs, the document creates necessary ambiguity when comparisons among alternatives are performed. Please describe in greater detail the site-specific issues that are creating the apparent ambiguity in developing more specific costs for this project, present a single cost estimate for each alternative as has been done in other projects.”

Response: *The range of costs reflects uncertainties associated with this unique project and the dynamic nature of the project area environment, as listed in Section 2.3.1.1 of the SSDEIS and Section 2.12.1 of the FEIS.*

Comment: “On page 2- 19, the document indicates that alternatives that require an expenditure of money over time (i.e., phased alternatives and nourishment alternatives) more closely align benefits derived by the public and the expenditure of the costs for infrastructure. It continues to conclude that alternatives with lower discounted costs can be viewed as providing a better return on investment than those with higher discounted costs. This conclusion is not accurate. While alternatives with lower discounted costs may represent a lower cost as measured in present day dollars, it does not necessarily represent increased value or return on investment. While DWQ understands that discounting costs to present day values is necessary to provide a fair comparison among alternatives that have expenditures occurring over different time frames, the conclusion that lower discounted costs represents better return on investment may be inaccurate. If it is assumed that benefits derived per dollar are less in the future than they are today (due to inflation), then the best rate of return on investment might be projects with higher discounted costs. DWQ recommends that the statement be removed and allow the costs as presented to stand on their own merit.”

Response: *The statement that the alternatives with lower discounted costs can be viewed as providing a better return is correct; the 5 percent discount rate accounts for inflation.*

Comment: “The environmental document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0508(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.”

Response: *The material described will be developed within the context of the customary NEPA/Section 404 merger process, including Concurrence Point 4A (avoidance and minimization), and Concurrence Points 4B and 4C (permit drawings review).*

Comment: “Environmental assessment alternatives should consider design criteria that reduce the impacts to streams and wetlands from storm water runoff. These alternatives should include road designs that allow for treatment of the storm water runoff through best management practices as detailed in the most recent version of NC DWQ Stormwater Best Management Practices, such as grassed swales, buffer areas, preformed scour holes, retention basins, etc.”

Response: *Additional material related to water quality impacts and on approaches to handling storm water on the bridges is included in Section 4.7.2 of the FEIS. NCDOT’s Best Management Practices for the Protection of Surface Waters would be incorporated into the design.*

Comment: “After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, the NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission’s Rules (15A NCAC 2H.OSOS (h)), mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.

In accordance with the Environmental Management Commission’s Rules (1 SA NCAC 2H.0506(h)), mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation is required, the mitigation plan should be designed to the appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.”

Response: *The activities described will occur within the context of the customary NEPA/Section 404 merger process, including Concurrence Point 4A (avoidance and minimization), and Concurrence Points 4B and 4C (permit drawings review). There are no streams in the project area.*

Comment: “Future documentation, including the 401 Water Quality Certification Application, should continue to include an itemized listing of the proposed wetland and stream impacts with corresponding mapping.”

Response: *The position is acknowledged. Future documentation developed within the context of Concurrence Points 4A, 4B, and 4C, including the 401 Water Quality*

Certification Application, will continue to include an itemized listing of the proposed wetland and stream impacts with corresponding mapping.

Comment: “DWQ is very concerned with sediment and erosion impacts that could result from this project. NC DOT should address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.”

Response: *Sediment and erosion control is addressed in Section 4.13.7 of the SDEIS and the FEIS. All construction activities will be consistent with NCDOT’s current sedimentation and erosion control standards.*

Comment: “An analysis of cumulative and secondary impacts anticipated as a result of this project is required. The type and detail of analysis should conform to the NC Division of Water Quality Policy on the assessment of secondary and cumulative impacts dated April 10, 2004.”

Response: *An analysis of the indirect and cumulative impacts is included in the SDEIS, SSDEIS, and this FEIS in Section 4.12.5. The analysis conforms to Division of Water Quality requirements when it documents why induced development is not expected.*

Comment: “NCDOT is respectfully reminded that all impacts, including but not limited to, bridging, fill, excavation and clearing, to jurisdictional wetlands, streams, and riparian buffers need to be included in the final impact calculations. These impacts, in addition to any construction impacts temporary or otherwise, also need to be included as part of the 401 Water Quality Certification Application.

1. Sediment and erosion control measures should not be placed in wetlands or streams.
2. Borrow/waste areas should avoid wetlands to the maximum extent practical. Impacts to wetlands in borrow/waste areas will need to be presented in the 401 Water Quality Certification and could precipitate compensatory mitigation.
3. The 401 Water Quality Certification applications will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into streams or surface waters.
4. Based on the information presented in the document, the magnitude of impacts to wetlands and streams may require an Individual Permit application to the Corps of Engineers and corresponding 401 Water Quality Certification. Please be advised that a 401 Water Quality Certification requires satisfactory protection of water quality to ensure that water quality standards are met and no wetland or stream uses are lost. Final permit authorization will require the submittal of a formal application by the NCDOT and written concurrence from the NCDWQ. Please be aware that any approval will be contingent on appropriate avoidance and minimization of wetland and stream impacts to the maximum extent practical the development of an acceptable stormwater management plan, and the inclusion of appropriate mitigation plans where appropriate.
5. If concrete is used during construction, a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

6. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas should be seeded or mulched to stabilize the soil and appropriate native woody species should be planted. When using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.
7. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3494 Nationwide Permit No. 6 for Survey Activities.
8. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.
9. All work in or adjacent to stream waters should be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock beams, cofferdams and other diversion structures should be used to prevent excavation in flowing water.
10. While the use of National Wetland Inventory (NWI) maps, NC Coastal Region Evaluation of Wetland Significance (NC-CREWS) maps and soil survey maps are useful tools, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.
11. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.
12. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.
13. Riparian vegetation (native trees and shrubs) should be preserved to the maximum extent possible, Riparian vegetation must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.”

Response: *These procedures apply to all NCDOT projects and will be followed within the context of the NEPA/Section 404 merger process, the Section 404 permit application process, and in developing and enforcing the terms and conditions for the design-build contractor. The SDEIS, SSDEIS, and FEIS wetland impact calculations are based on delineated wetlands.*

North Carolina Department of Environment and Natural Resources-Natural Heritage Program-January 12, 2006 (page A-51)

Comment: “The Natural Heritage Program has numerous locations of rare species and significant natural areas in the vicinity of the project. Most of Pea Island National Wildlife Refuge, with the exception of the three man-made impoundments, is a Registered Natural

Heritage Area. The refuge is Nationally significant because of its great importance to wintering and migrating waterbirds. In addition, the beaches are used by nesting loggerhead sea turtles (*Caretta caretta*), a Federally Threatened species. The Federally Threatened piping plover (*Charadrius melodus*) breeds sporadically at both the southern tip of Bodie Island (National Park Service) and the northern tip of Pea Island; it also occurs in migration and occasionally in winter at these sand flats. At least 15 other rare animals, two rare plants, and several colonial waterbird nesting sites have been recorded on the refuge (see enclosed material [pages A-52 and A-53 of this FEIS]).”

Response: *Comment noted. Discussions of threatened and endangered species are included in the SDEIS and the FEIS in Sections 3.7.7 and 4.7.9. The Biological and Conference Opinions (USFWS, 2008) document of USFWS is presented in Appendix E.*

Comment: “Several islands inside Oregon Inlet are used for nesting by various colonial waterbirds. Because these islands are constantly shifting and being eroded, the birds also constantly move from year to year. NC DOT should coordinate with the NC Wildlife Resources Commission about the most recent locations and population sizes of the nesting waterbirds inside the inlet. It appears unlikely that these islands and waterbird colonies would be impacted by the Pamlico Sound Bridge Corridor, though NCDOT should make certain that the alignment does not pass over islands where birds have recently nested. Impacts to natural heritage resources, unless to colonial waterbird nesting islands, appear to be minimal with the Pamlico Sound Bridge Corridor alternative. According to Figure 3-6, the proposed alignment of the route appears to almost completely “by-pass” Submerged Aquatic Vegetation. The southern terminus of the Bridge would be in the town of Rodanthe. The northern terminus would be on Bodie Island close to the current northern terminus of the Bonner Bridge and is not likely to impact significant natural resources. In addition, the terminal groin at the tip of Pea Island would no longer serve a need to stabilize the inlet, and might well be removed. This would allow for more natural sand movement and natural inlet movement, thus providing better habitat at the tip of the refuge for nesting turtles and plovers.”

Response: *Comment noted. The Pamlico Sound Bridge Corridor alternative was not selected as the Preferred Alternative.*

Comment: “On the other hand, the Parallel Bridge Corridor poses a number of Natural Heritage concerns. The new bridge location by itself is not a concern, as it would parallel the existing bridge, which is to be removed with either alternative. However, wetland impacts will be much greater with the majority of the Parallel Bridge Corridor alternatives. The All Bridge Alternative would cross over at least two of the impoundments, which are used by thousands of birds for foraging. All of the Parallel Bridge Corridor alternatives would require some impacts to the dune system, and one or two would require massive amounts of dune creation and dredge material deposition onto the beaches, all of which negatively impact invertebrate usage of the beaches and might negatively impact nesting by sea turtles. Thus, these Parallel Bridge Corridor alternatives will impact the Registered Natural Heritage Area to some degree.”

Response: *None of the alternatives in the SDEIS were selected as the Preferred Alternative. The Phased Approach/Rodanthe Bridge Alternative (Preferred) has lower wetland impacts, no dune creation, and would use Refuge lands within the existing NC 12 easement.*

Comment: “If the Pamlico Sound Bridge Corridor is selected as the preferred alternative, the U.S. Fish and Wildlife Service would be responsible for maintenance of the “old NC 12” through

the refuge. The DEIS states on Page 4-39 that “some type of access to the Refuge would be maintained by the USFWS and NPS for recreational users”. At this time it is not possible, nor is it feasible, to predict potential negative impacts to the impoundments and to the natural communities such as the salt flats, marshes, and grasslands if the maintenance of “old NC 12” is shifted from NCDOT to USFWS and NPS. However, because of the constantly shifting nature of the barrier islands to the west, sand and salt water have frequently been carried into the freshwater impoundments, and the “buffer” to the east between the Atlantic Ocean and the impoundments becomes narrower each year. Negative impacts to these important sites, though man-made, will be inevitable under either the Pamlico Sound Bridge Corridor or the Parallel Bridge Corridor.”

Response: *The impact on the impoundments resulting from allowing beach erosion to occur is considered an acceptable outcome by the National Park Service and the USFWS, as discussed in Sections 4.1.2.3 and 4.1.2.4 of the SDEIS and the FEIS.*

Comment: “In summary, the Natural Heritage Program believes that the Pamlico Sound Bridge Corridor will cause less impact to significant natural resources and to the Pea Island NWR Registered Natural Heritage Area than will the various Parallel Bridge Corridor alternatives.”

Response: *This position is acknowledged. No response is needed.*

North Carolina Department of Environment and Natural Resources-Natural Heritage Program-March 26, 2007 (page A-54)

Comment: “The Supplement to the 2005 Supplement notes that the Pamlico Sound Bridge Corridor “would not result in permanent disturbance to Significant Natural Heritage Areas (SNHA) identified by the North Carolina Natural Heritage Program (NCNHP)” (page xx). We would also note that this natural area is also included on the Registry of Natural Heritage Areas under the Nature Preserves Act.”

Response: *This classification for the Refuge is described in Section 3.7.5 of the SDEIS and the FEIS.*

Comment: “Page xx states that “The construction of the Parallel Bridge Corridor would result in permanent and temporary disturbance to the Refuge, identified as a SNHA by the NCNHP, with all of the Parallel Bridge Corridor alternatives.” Note again that the natural habitats at Pea Island National Wildlife Refuge are Registered Heritage Areas. The SDEIS says that there will be a 10-mile long bridge thru the refuge, at 30 feet above ground. It would be a visual blight (Section 4.3.2). The SDEIS does not make it clear if NC 12 would pass over the impoundments or run along the eastern edges.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement for which NCDOT has a permit. It does not pass over the impoundments. The NC 12 easement runs along the eastern edges of the impoundments.*

Comment: “Page xxii, it states “The Pamlico Sound Bridge Corridor would support the desire of officials responsible for the Refuge and the Seashore to not stabilize the Outer Banks artificially, but rather to let natural processes take their course.” Similarly, from a purely ecological habitat perspective, the Natural Heritage Program favors the Pamlico Sound Bridge Corridor.”

Response: *The commenter's position is acknowledged. The reasons why the Pamlico Sound Bridge Corridor was not found to be the LEDPA are in Section 2.15 of the FEIS.*

North Carolina Wildlife Resources Commission-January 17, 2006 (page A-54)

Comment: “For the purpose of this evaluation both the Road North/Bridge South and the All Bridge alternatives will be incorporated into the same analysis due to similarities in impacts. Direct impacts associated with these alternatives consist of 90.3 acres of impact to the refuge with 78.2 acres of wetland impact for the Road North/Bridge South alternative and 89.6 acres of refuge impacts with 12.3 acres of wetland impacts for the All Bridge alternative. These are substantial permanent impacts to a federally owned natural area. Pea Island National Wildlife Refuge is utilized by waterfowl, wading birds and shore birds such as terns, black skimmers, Wilson’s plover, American oystercatcher and the federally listed Piping plover. Although the All Bridge alternative does reduce the wetland impacts associated with relocating the road west of the existing location, disturbance from construction activities coupled with shading impacts over wetlands will change current vegetation characteristics and habitat suitability. Furthermore these are direct impacts to a 4(f) resource; further consideration of this alternative would be inconsistent with past NCDOT projects.”

Response: *Chapter 2 of this FEIS presents a historical discussion of the alternatives development process, which began in 1990. Section 2.6 of this FEIS examines the Parallel Bridge Corridor with NC 12 Maintenance alternatives and discusses the reasons for the elimination of specific alternatives and the reasons for retaining three alternatives for detailed evaluation in the SDEIS. These two alternatives, however, were not selected as the Preferred Alternative for the project.*

Comment: “The third parallel bridge corridor alternative involves retaining NC 12 on its current alignment while utilizing approximately 6.3 miles of beach and dune nourishment. The estimated amount of sand needed to nourish the four areas identified approximately every four years is in excess of 46.6 million cubic yards of compatible sand. The document revealed that retention of NC 12 in its current location even with the extensive beach nourishment would continue to leave the roadway susceptible to overwash and potential breach depending on storm intensity and frequency. As stated in section 1.2 of the SDEIS, one purpose of this project is to, “Provide a replacement crossing that will not be endangered by shoreline movement through year 2050.” Therefore, this alternative does not appear to meet the purpose and need. Additionally, Barrier island overwash provides important nesting and foraging habitat for shorebirds including the federally threatened Piping plover. The current requirement to maintain NC 12 eliminates this essential habitat. When the roadway is breached or over washed, sand is scraped off the roadway and incorporated into a berm to protect the road; the important overwash/sand flat habitat is perpetually lost impacting waterbirds that depend upon it for foraging and nesting.”

Response: *The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “Beach and dune nourishment has frequently been utilized by NCDOT as a means to protect NC 12. Nourishment does not allow for the natural migration of sand on the Barrier Islands. As listed in the SDEIS section 3.1.3.3 under the National Park Service Plan, “realizing the problems that the managed dune system caused the estuaries...The government no longer attempts to stabilize the Outer Banks artificially but lets natural processes take their course. In its 1991 *Draft Revised Statement for Management*, the NPS affirmed a policy of managing the Seashore in ways “that support the natural processes of barrier island dynamics...” (NPS, 1991).”

NCWRC supports allowing the natural processes to return to the barrier islands. It is these processes which create and maintain habitat for wading and shore birds. Beach nourishment projects have shown adverse impacts to the invertebrate base shore birds and wading birds depend upon. These impacts can be both short and/or long term depending on the characteristics of the sand used for the project. Even if impacts are short term, with an expected re-nourishment rate of 4 years, short term impacts will be repeated, therefore continually degrading habitat Pea Island National Wildlife Refuge and Cape Hatteras National Seashore was established to protect. Section 2.6.3.4 states: “Any nourishment program will need to consider the effect of sand placement on beach and near shore invertebrate populations and their recovery.” This analysis will need to be completed prior to further consideration of this alternative.”

Response: *This alternative was not selected as the Preferred Alternative. The Phased Approach/Rodanthe Bridge Alternative (Preferred) does not include nourishment.*

Comment: “During review of the SDEIS we noted limited information on the availability of compatible sand. Environmental impacts notwithstanding, there are several issues that need to be addressed prior to continuing any consideration of this alternative. NCDOT ‘s cumulative sand needs for the Outer Banks should be considered. NCDOT currently has proposed alternatives for R-3116a-b which would utilize an anticipated one million plus cubic yards of sand. The SDEIS identifies probable sand source locations including Oregon Inlet dredging and offshore sites, however the document states the need for Oregon Inlet dredging will be reduced with all alternative therefore decreasing the available sand. There is no information concerning the compatibility of sand sources identified in the document. Further consideration of the nourishment alternative will require extensive compatibility analysis to determine the viability of these sand sources.

Dredging activities in conjunction with the mechanical positioning of sand to nourish the beach and build the associated dune structures are additional environmental concerns with this alternative. Commitments from NCDOT disallow the use of a hopper dredge for bridge construction; however this commitment has not been made for collection of material for nourishment. Dredging and dune reconstruction activities can impact sea turtles and shorebirds. Nesting periods for shorebirds and sea turtles generally cover a time period from April 1 through November 15; any recommended nourishment activity during this time frame could impact these species.”

Response: *This alternative was not selected as the Preferred Alternative. If it had been selected as the Preferred Alternative, additional information beyond that presented in Section 2.8.2.1 of the SDEIS and Section 2.10.2.1 of the FEIS pertaining to available and suitable sand sources would have been sought.*

Comment: “Historically the [Parallel Bridge Corridor with Nourishment] alternative has been the most expensive alternative at a projected cost of \$644,050,000 compared to the Pamlico Sound Bridge alternative costing \$424,890,000. Table 2-9 [in SDEIS] outlines the use of a cost discounting model used to adjust the projected cost of the nourishment alternative to \$344,800,000 now less than the Pamlico Sound bridge alternative. According to 2.6.3.3 cost discounting is based in theory upon a benefit versus cost type of analysis. The analysis shows that most alternatives only have a slight reduction in cost while the nourishment alternative is reduced by almost 50% since the benefits of beach nourishment are spread out over the life of the project. However, it is unclear how a benefit-cost analysis can be conducted on an item as unpredictable as the life span of beach nourishment. Recently, NC 12 had extensive areas of beach and dune nourishment that were lost in as little as one week. It was also not clear if the rate

of inflation was included in this cost estimate, since the nourishment alternative will carry cost 50 years beyond initial completion.”

Response: *The best available information pertaining to predicting the rate of and the amount of sand needed for long-term nourishment was used in the SDEIS and the SSDEIS. Inflation is taken into account in the discount rate. The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative.*

Comment: “The fourth corridor represents the Pamlico Sound bridge alternatives which are composed of a 17.5 mile bridge with alternatives varying only in terminus options in Rodanthe. This alternative focused on removing NC 12 from areas with high erosion rates between Rodanthe and the Northern tip of Hatteras Island and avoiding impacts to the refuge. The current western alignment of the bridge was designed to minimize impacts to submerged aquatic vegetation (SAV) by locating the bridge in waters deeper than 6 feet. Some SAV impacts were unavoidable where the structure nears shore and ties back into existing NC 12. Although similar in direct impacts to SAV with the nourishment alternative at 0.31 acres versus 0.20 acres, shading impacts are the greatest of all alternatives estimated at 9.20-8.90 acres. SAV impacts can be avoided and minimized during construction of this alternative by utilizing work bridges in areas of existing SAV. Based on current estimates, approximate 8 miles of dredging may be required for barge access during construction with the intention of allowing barge operations in waters 8 feet in depth. The location of the proposed dredging is unclear; however the document states no dredging required for the construction of this alternative will occur in areas containing SAV.”

Response: *Dredging would be required in locations where Pamlico Sound is less than 6 feet (1.8 meters) deep to allow barge access. The proposed areas are shown in Figure 2-11 of the SDEIS and the FEIS. If this alternative had been selected as the Preferred Alternative a detailed bathymetry of the sound in the area of the corridor would have been developed to refine dredging requirements. SAV surveys would have been conducted.*

Comment: “Water quality issues are a concern with this alternative [Pamlico Sound Corridor] due to storm water runoff associated with a bridge of this length over SA waters, and temporary turbidity associated with construction. The application of Best Management Practices and Design Standards in Sensitive Watersheds are expected to minimize the impacts to water quality, however it is unlikely these impacts can be avoided.”

Response: *Additional material related to water quality impacts is included in Section 4.7.2 of the FEIS. Impacts associated with construction are discussed in Sections 4.13.6 and 4.13.7 of the SDEIS and the FEIS. NCDOT’s Best Management Practices for the Protection of Surface Waters would be implemented for any of the alternatives.*

Comment: “On the northern tip of Hatteras Island, the terminal groin was permitted to protect the southern terminus of Bonner Bridge. If the Pamlico Sound Bridge alternative is selected, it is likely the terminal groin will no longer serve that purpose and therefore will be removed as a condition of the ‘404’ permit. This structure currently anchors the southern shore of the inlet. Removal of this groin will permit the inlet to migrate south, thus eroding the northern tip of Hatteras Island. The removal of the groin will return the natural processes of inlet migration to the island restoring natural wading and shorebird habitat. However, terminal groin removal will likely threaten the National Register-listed former Oregon Inlet US Coast Guard Station.”

Response: *The removal of the groin is a condition of a USFWS permit. The current design of the Phased Approach/Rodanthe Bridge Alternative (Preferred) requires the groin to remain in place. NCDOT will seek a permit if requested by USFWS.*

Comment: “The NCWRC has conducted a thorough review of the SDEIS for the replacement of Herbert C. Bonner Bridge and the associated improvements addressing a long term solution for seashore encroachment on NC 12. Environmental impacts associated with the parallel bridge alternatives are unacceptable. Both the Road North Bridge South alternative and the All Bridge alternative represent unacceptable impacts to fish and wildlife resources and their habitat. Additional information related to amounts of compatible sand is needed for consideration of the nourishment alternative. However, beach and dune nourishment of this magnitude will impact invertebrates important as forage for shorebirds and waterbirds in addition to sea turtle nesting habitat. With a frequency no longer than 4 years these impacts can be expected for the life of the project. Nourishment does not allow for natural process to develop the habitat needed to enhance waterbird and sea turtle populations on the barrier islands. The Pamlico Sound Bridge was developed to avoid the impacts associated with the parallel bridge alignment alternatives. After evaluating all alternatives, the NCWRC believes the Pamlico Sound Bridge corridor to be the Least Environmentally Damaging Practicable Alternative.”

Response: *None of the Parallel Bridge Corridor alternatives assessed in the SDEIS and listed above were selected as the Preferred Alternative. The reasons why the Pamlico Sound Bridge Corridor was not found to be the LEDPA are in Section 2.15 of the FEIS.*

North Carolina Wildlife Resources Commission-March 26, 2007 (page A-57)

Comment: “Throughout our involvement with this project we have consistently maintained the need to select an alternative that will allow the natural processes to return to the barrier islands. The creation and preservation of habitat utilized by wading and shore birds in addition to sea turtle nesting habitat depend on this natural succession. The supplemental document promotes the phased approach alternatives as an alternative that will allow barrier island processes to take place by elevating the roadway and permitting the shoreline to process inland while “passing” underneath the bridge structure. Essentially elevating NC 12 will allow the shoreline to naturally evolve and progress inland, however the habitat created will be severely impacted by the presence of the bridge structure.”

Response: *The design of the Phased Approach/Rodanthe Bridge Alternative (Preferred) does allow for natural processes to occur. Additional material related to natural resource impacts of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.7 of the FEIS.*

Comment: “Coastal waterbird habitat such as overwash zones, inlets, and sand flats created in the vicinity of the phased approach bridges will not provide appropriate habitat while in close proximity to the bridge structures. Coastal waterbirds require sandy areas with unobstructed views for predator detection; elevated structures not only provide an obstruction but also a location for predation birds such as crows, raptors and grackles to perch near waterbird habitat. Once the final phase has been completed, this condition will exist for approximately 10 miles to the southern termini of the project.”

Response: *The location where such a statement was made (in relation to piping plovers) has been clarified in the FEIS (Section 4.7.9) to note that while potential habitat would be created, its use would be effected by the bridge structure. The distance where the*

Phased Approach/Rodanthe Bridge Alternative (Preferred) would be over the beach is presented in Table 4-23 for five different years through 2060. The longest length of bridge over the beach indicated is 3.3 miles (5.3 kilometers).

Comment: “In addition the structure will impact the ability of sea turtle habitat to properly function. As mentioned in the document sea turtle nesting is both light sensitive and temperature sensitive. Structures that produce a shadow on the beach can alter sea turtle nest incubation temperatures (Mrosovsky et al. 1195. Thermal effects of condominiums on a turtle beach in Florida. Biological Conservation 74:151-156). Sea turtles exhibit temperature dependent sex determination, reduced temperatures associated with shading could alter sex ratios to a degree that may affect population growth over time. Furthermore any elevated structure located in the vicinity of sea turtle nesting habitat will need to be designed to eliminate artificial lighting such as street lights or head lights from reaching the beach or nesting areas. Artificial lights near the nesting areas can disorient hatchlings.”

Response: *For the Phased Approach/Rodanthe Bridge Alternative (Preferred), FHWA has completed formal consultation with the US Fish and Wildlife Service under the requirements of Section 7 of the Endangered Species Act of 1973, as amended. Its findings, including those for sea turtles, are presented in Section 4.7.9 of the FEIS and a Biological Assessment (FHWA and NCDOT, 2008) as well as the Biological and Conference Opinions (USFWS, 2008) document of USFWS (see Appendix E). Light and temperature sensitivity are discussed.*

Comment: “Construction impacts related to the phased approach alternatives include: nighttime construction zone lighting, temporary construction impacts, disruption of waterbird utilization of Pea Island National Wildlife Refuge and disruption of sea shore habitat use. In contrast to other alternatives there are cumulative impacts associated with the phased construction. Section 2.2.2.4 shows the total construction time frame is estimated to be 12.5 years of construction over approximately the first 20 years. This presents a significant scale of construction over an extended time frame. Impacts associated with the cumulative effects of prolonged construction were not adequately discussed in the supplement; NCDOT should provide this information prior to selecting an alternative. Once an alternative is selected, recommended environmental commitments designed to reduce impacts to these species including a shorebird and sea turtle nesting area construction moratorium from April 1 to November 15 should be developed.”

Response: *FEIS Section 4.7 notes the direct natural resource impacts associated with the Phased Approach/Rodanthe Bridge Alternative (Preferred) over the extended time frame of construction. NCDOT and FHWA consider these impacts to be direct impacts, not indirect and cumulative impacts, since they are directly associated with the proposed action. Construction activities will need to occur between April 1 and November 15. Mitigation for potential impacts to the piping plover and sea turtles was an outcome of formal consultation with the US Fish and Wildlife Service under the requirements of Section 7 of the Endangered Species Act of 1973, as amended, as discussed in Section 4.7.9 of the FEIS, a Biological Assessment (FHWA and NCDOT, 2008), and the Biological and Conference Opinions (USFWS, 2008) document of USFWS (see Appendix E). Section 4.7.6.5 of the SDEIS, the SSDEIS, and the FEIS discusses impacts to Oregon Inlet birds.*

Other

Letters were received from the North Carolina Department of Administration (January 30, 2006 on page A-36 and April 16, 2007 on page A-36) that transmitted other state comment letters only. A comment letter was received from the NC Department of Cultural Resources (March 19, 2007 on page A-37) that had no comments.

8.12.2.3 Regional and Local

County of Dare-December 7, 2005 (page A-58)

Comment: “As you are aware, the replacement of the current Bonner Bridge is critical, it is our understanding that the stability rating of the existing bridge is four on a scale of one hundred. As the only land transportation route to Hatteras Island and as the main route to Ocracoke Island, the Bonner Bridge is vital to the residents of Hatteras Island and Ocracoke Island and to the economies of Dare and Hyde counties.

The Dare County Board of Commissioners supports the “short bridge” alternative for a number of reasons. This alternative will allow the replacement of the existing bridge sooner which is imperative: to Hatteras Island and Dare County. This alternative will also save the tax payers significant amounts of money which will allow other important road projects in the area to proceed.

The short bridge alternative will guarantee full public access to Pea Island and will preserve safe and efficient hurricane evacuation routes. This alternative is sensitive to the environment in that it requires less dredging and therefore minimal construction impacts to the Pamlico Sound and its submerged aquatic vegetation and shellfish habitat.

Finally, the short bridge alternatives will enhance the stability of Oregon Inlet by allowing the retention of the Terminal Groin which stabilizes Northern Pea Island and Inlet Channel. This stabilization will reduce the channel dredging requirements and have fewer impacts on the Pamlico Sound than other alternatives. The construction of the short bridge will further maintain full public access to-the state-owned historic Oregon Inlet Coast Guard Station.

For these reasons, and others, the Dare County Board of Commissioners reiterates its support for the 2.7 mile parallel bridge alternative and again, encourages DOT to continue to work diligently to make the Bonner Bridge replacement a reality in the very near future.”

Response: *The Phased Approach/Rodanthe Bridge Alternative was selected as the Preferred Alternative and includes the “short bridge” desired by the commenter.*

Town of Nags Head-April 2, 2007 (page A-59)

Comment: “The Town of Nags Head Board of Commissioners at their January 4, 2006 Regular meeting approved the attached resolution urging the North Carolina Department of Transportation and the U.S. Fish and Wildlife Division, U.S. Department of the Interior, to replace the aging Herbert C. Bonner Bridge over the Oregon Inlet with a parallel bridge immediately.”

Response: *The Phased Approach/Rodanthe Bridge Alternative was selected as the Preferred Alternative and includes the “parallel bridge” desired by the commenter.*

8.12.3 Non-Governmental Organization Comments and Responses

This section responds to written comments on the SDEIS and the SSDEIS submitted by non-governmental organizations (NGOs). The comments in the sections that follow consist of quotes from the correspondence received. Each substantive comment requiring a response is listed below. The original correspondence is presented in Appendix B.

8.12.3.1 Audubon North Carolina-April 13, 2007 (page B-240)

Comment: “The Phased Approaches Will Not Provide Reliable Transportation. The Supplement states that the Phased Approach/Rodanthe Bridge alternative would bridge all five potential breach locations and the Phased Approach/Rodanthe Nourishment Alternative would bridge all locations except for part of the southernmost potential breach location, which just happens to be the one “most likely to suffer a breach before 2060” (Supplement at 2-12). However, construction of the four phases is “based on their need from the perspective of the condition of Bonner Bridge, potential breach locations (see Figure 2-1), and the location of future forecast beach erosion” (Supplement at 2-12 to 2-13). The predictions underlying the four phase approach could be very different from what actually occurs in the future. If a large storm or a series of smaller storms were to strike the Outer Banks before the four phases were completed, the paved road transportation link in the non-bridged area could be severed. The Phased Approaches are an expensive, massive gamble that could end up being a bridge to nowhere.

In addition, we remain concerned about the transportation reliability of a bridge that is in the high energy environment of the Atlantic Ocean. In contrast to the Pamlico Sound Bridge Corridor, which will be in the lower energy environment of the Pamlico Sound, the Phased Approaches eventually will be in the Atlantic Ocean. While the Supplement includes a discussion of design features relating to piling height and width (Supplement at 2-10), NCDOT also notes that “[i]n light of Hurricane Katrina in 2005, an AASHTO/FHWA Joint Wave Task Force is developing interim guidance for quantifying wave forces on bridges, structural design approaches for wave forces, and deployment of countermeasures for existing bridges” (Supplement at 2-12). Audubon Staff have observed a bridge on I-10 that was destroyed by a recent hurricane, and that bridge was located in a bay off of the Gulf of Mexico, not out in the Atlantic Ocean. We are unaware of any bridge that is located in such a dynamic and high energy environment for such a long distance. We request that NCDOT include in the FEIS a discussion of similar bridges located in ocean locations with comparable wave energy; the reliability of such bridges; and the construction and maintenance costs associated with such bridges. Furthermore, do the projected costs associated with the Phased Approaches anticipate the higher design standards of the Wave Task Force?”

Response: *NCDOT recognizes that the shoreline could evolve differently than the assumptions used in developing the Phased Approach/Rodanthe Bridge Alternative (Preferred). A monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS. The I-10 bridge damaged in Hurricane Katrina was built at an elevation below the storm surge. Its replacement is being built above the anticipated storm surge and storm wave heights. NCDOT sought to identify similar bridges to NC 12 maintenance bridge component of the Phased Approach/Rodanthe Bridge Alternative (Preferred). None were identified. The projected costs associated with the Phased Approach alternatives (including the Preferred Alternative) anticipate the higher design standards of the Wave Task Force. Two senior employees of NCDOT serve on the task force.*

Comment: “The Phased Approach bridges would have a 40-foot roadway width and have a minimum 25-foot vertical clearance between the bottoms of the superstructure (spans) and mean high water (Supplement at 2-10). The bridges would be built “within the NCDOT’s existing 100-foot easement within the Refuge” (Supplement at 2-3). While initially on land, the bridges “associated with the Phased Approach ultimately would move to the shoreline and then offshore in the Atlantic Ocean as the shoreline erodes underneath the bridges” Supplement at 4-18.

NCDOT acknowledges that the Phased Approach Alternatives would “reduce beach access” and “eliminate” the ability to surf in an area once the pilings are in the ocean (Supplement 4-18). In addition, the Supplement states that hiking and other beach activities “could take place” when the bridge is over the beach, though not in the “undisturbed natural setting in which they now occur” (Supplement at 4-18).

While the Supplement does mention certain recreational impacts, Audubon is very concerned that the document downplays the significant adverse impacts of having a bridge on the beach or just offshore. A bridge in the intertidal or near shore area would not only make surfing hazardous, but also make similar activities such as swimming or ocean kayaking extremely hazardous and would eliminate windsurfing or kite boarding in those areas where the bridge is in the water or the intertidal area. In addition, bird watching, a favored activity of thousands of our members and visitors to Pea Island, would be curtailed in beach areas where the bridge is in the ocean, as it would no longer be possible to have an unobstructed view of the ocean area to search for pelagic or other species. A massive bridge in the ocean would not be a minor inconvenience; rather, it would be a significant, long-term degradation of the recreational values of the refuge.”

Response: *The additional recreational activities noted in this comment were added to Section 4.5.3 of the FEIS.*

Comment: “The Supplement remains unclear regarding NCDOT’s position as to what extent natural forces will be allowed to operate on the coastline. In certain areas, there is a suggestion that such forces will be allowed to operate. For instance, NCDOT notes that the “existing dunes along the oceanside would not be re-built (i.e., they would be allowed to erode naturally). Not-rebuilding the dunes would support Refuge and Seashore Policies to let natural processes take their course” (Supplement at 2-26). Yet, presumably, in the sections of the Phased Approach that are still based on a road that is on the ground, NCDOT will maintain the artificial dune until the bridge section phase in that area is constructed? To do otherwise would expose the road to an increased risk of being covered with sand or severed.

Response: *The expected impact of NC 12 maintenance activities that would occur prior to the implementation of each phase with the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.6.8.6 of the FEIS. A monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement.*

Comment: “The Supplement also is unclear as to what action will be taken if an inlet opens up on the refuge. Certain sections of the document suggest that an inlet will be allowed to remain open. For example, NCDOT notes that the ‘word ‘breach’ is used rather than the word ‘inlet’ because if a breach were to occur, it would likely close eventually (though not necessarily immediately) and likely would not become a long-term phenomenon like Oregon Inlet” (Supplement at 3-4). Yet, there continues to be the discussion of closing an inlet (Supplement at 4-6, noting that it “could take 3 -6 months to close a breach”).

Response: *Although a breach could fill in naturally, it is likely that the breach would be closed or temporarily bridged because there would be an immediate need to reopen the road. The timing and nature of a breach cannot be precisely predicted. Given this factor, the phasing scheme for the Phased Approach/Rodanthe Bridge Alternative (Preferred) assumes that four of the five potential breach locations are bridged during Phase II, including the area at Rodanthe where a breach is most likely to occur. It is NCDOT's intent to place a high priority on the implementation of Phase II as soon as it is practicable. The fifth location (former New Inlet area) would be bridged during Phase III.*

Comment: The Supplement's failure to fully address the positive geological and biological impacts of ocean overwash and inlet formation, migration, and closure is a serious deficiency. Audubon previously addressed this issue in detail in our comment letter on the SDEIS (Attachment A). In the Supplement, NCDOT just repeats brief statements at several locations about Refuge and Seashore Policies, without providing any real detail about those policies or the extensive scientific and policy review that went into formulating those processes. As a result, the Supplement not only fails to disclose the positive environmental impacts of the Refuge and Seashore policies, but also fails to disclose how road maintenance activities that are inconsistent with those policies will result in adverse environmental impacts, as required by the National Environmental Policy Act.

Response: *A discussion of the positive geomorphological and natural resource benefits of allowing the natural movement of the shoreline to take place is added as Section 4.7.7 of the FEIS.*

Comment: In drafting the FEIS, NCDOT should clearly indicate when an inlet or "breach" will be allowed to remain open and when it will be closed. And, as required by NEPA, the full direct, indirect, and cumulative environmental impacts of closing an inlet should be disclosed. Likewise, the FEIS should clarify exactly when and how artificial dunes will be maintained. As required by NEPA, NCDOT should disclose the full direct, indirect, and cumulative environmental impacts of maintaining an artificial dune system."

Response: *See the response above to the comments of this letter related to breaches. A description of anticipated NC 12 maintenance activities, including dune maintenance, prior to the implementation of each phase of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.6.8.6. Natural resource impacts of those activities are addressed in Section 4.7.8.*

Comment: "The Supplement's discussion of the direct and indirect impacts of the alternatives on "Oregon Inlet Birds" (4-35 - 4-36) and on the Piping Plover (4-37) is inadequate. Audubon previously addressed these concerns in detail in our prior comment letter, and it is disturbing that these important issues still have not been addressed properly.

The Supplement states that construction activities for the Pamlico Sound Bridge Corridor "would affect less than 1 acre (0.4 hectare) of potential nesting or foraging habitat..." (4-37). The Supplement fails to acknowledge the extensive benefits from the hundreds of acres of nesting, feeding, and resting habitats that would be created naturally if the road were removed from the refuge and natural overwash patterns were restored. These newly created areas would be prime habitat for not only the Piping Plover, but other beach nesting birds.

The Supplement states that “[s]ince construction of the two Phased Approaches would take place within the existing NCDOT easement, disturbance to potential nesting or foraging habitat in the project area would be minimal. However, shoreline erosion could create Piping Plover habitat under the bridges as the shoreline erodes” (4-3 7). This statement fails to address the direct and indirect adverse impacts of having a road and associated road maintenance activities throughout the Refuge on the Piping Plover. Once the bridge is a sufficient distance offshore, it will not be an issue, but until that time, the considerable adverse impacts outlined in our previous letter will remain. Moreover, we are aware of no existing location where there is Piping Plover “habitat under the bridges...” (4-3 7). We request NCDOT provide examples of Piping Plovers nesting or otherwise using habitat under similar bridges, or withdraw the statement. And, in the event there is such close proximity of use, the FEIS should address whether a bridge being located near habitat could result in vehicles striking birds, which would be “take” as defined by the Endangered Species Act.

The Supplement also notes that “[beach nourishment along the shoreline within the Parallel Bridge Corridor with Nourishment Alternative and the Phased Approach/Rodanthe Nourishment Alternative, could potentially encourage future nesting species” (4-37). For that statement to be accurate the profile and substrate of the created beach would have to be compatible with nesting habitat; in addition, disturbance and predation would have to be managed properly. The Supplement does not provide adequate information to support the claim. Indeed, the document fails to address a more likely result: that the “nourished” beach will not be suitable for nesting, due to the steep profile, lack of feeding habitat, and planting of dune grasses.

Audubon requests that the discussion about “Oregon Inlet Birds” (4-35) be revised to address these same issues.”

Response: *A discussion of the positive natural resource benefits of allowing the natural movement of the shoreline to take place is added to Section 4.7.7 of the FEIS. For the Phased Approach/Rodanthe Bridge Alternative (Preferred), FHWA has completed formal consultation with the US Fish and Wildlife Service under the requirements of Section 7 of the Endangered Species Act of 1973, as amended. Its findings, including those for the piping plover, are presented in Section 4.7.9 of the FEIS. Regarding the statement on page 4-37 of the SSDEIS, only the possibility is raised and reasons why it is difficult to draw absolute conclusions are noted. The commenter notes additional reasons. Additional material related to natural resource impacts of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 4.7 of the FEIS.*

Comment: “The Supplement’s Breach Analysis notes that at the potential inlet location at “Site 5,” which is to the south of the existing terminal groin, “erosion on the estuarine (sound) side of the terminal groin has been observed. The maximum shoreline erosion to date is 275 feet (83.8 meters) and substantial shoreline change extends approximately 1,000 feet (304.8 meters) south of the rock revetment” (Supplement at 3- 6). While the Supplement does include a discussion of a “breach” forming at this location and how it may affect the Phased Approach Alternatives (4-20- 4-2 I), Audubon is concerned that the Supplement fails to address a foreseeable, and perhaps even more likely, response: after continuing erosion brings the western shoreline closer to the road (or bridge, depending on which phase has been reached), NCDOT declares an “emergency,” avoids following normal environmental review requirements, and extends the west end of the revetment 1,000 feet or more to the south to stabilize the shoreline. This response is foreseeable, given the actions that occurred in the past, specifically, the closure of Isabel Inlet and the response to the accelerated erosion that prompted the construction of the existing terminal groin in the Refuge. Unless the NCDOT will guarantee as an irrevocable permit condition that the

revetment will not be extended, the FEIS should include a discussion of the environmental impacts and economic costs of extending the terminal groin.”

Response: *NCDOT does not anticipate the need to extend the terminal groin (revetment). As noted in the description of the Phased Approach/Rodanthe Bridge Alternative (Preferred) in Section 2.2.2.1 of the SSDEIS and in Section 2.10.2.5 of the FEIS: “The NC 12 bridges between the northern end of Hatteras Island and the southern end of the Canal Zone Hot Spot were assumed to have a more substantial foundation than the remainder of the NC 12 bridges to the south in order to accommodate a potential breach that could be deeper than breaches that might occur elsewhere in the Refuge.” New discussion addressing design criteria for establishing pile lengths that prevent the need for extended or new revetments and stabilizing structures is included in Section 2.10.1.2 of the FEIS.*

Comment: “NCDOT notes that although “the NC 12 Maintenance alternatives are described and addressed in the SDEIS and this Supplement as five separate alternatives, their components could be mixed and matched geographically along the length of NC 12 to create other variations” (Supplement at vi). Thus, “different combinations of the components of the alternatives also are possible” Supplement at 2-4.

Audubon strongly objects to this “mix and match” approach, as it raises serious concerns regarding compliance with the mandates of the National Environmental Policy Act. Depending on which alternative is chosen, there are a range of direct and indirect environmental impacts. Failing to disclose what may be implemented deprives the public of information regarding the impacts of that alternative and prevents the public from having an opportunity to submit comments.”

Response: *A “mix and match” alternative or an alternate combination of the components of one or more alternatives was not selected as the Preferred Alternative.*

Comment: “NCDOT notes that the “full life of the proposed bridge [is] estimated to be as much as 100 years” (Supplement at xxvii). Yet, the Supplement only estimates costs “through 2060” (Supplement at 2-15). This abbreviated analysis period seriously skews the cost/benefit analysis for any options which involve beach replenishment in a way that biases the analysis against the Pamlico Sound Bridge Corridor. In addition, with the higher wave energy and thus, presumably greater maintenance costs of maintaining a bridge in the ocean, the shorter analysis period also may affect the accuracy of the cost figures for both Phased Approach Alternatives.

Audubon also is amazed that with the passing of just two years, construction costs for the Pamlico Sound Bridge have gone from \$55-60 per square foot to \$130 - \$220 per square foot, depending on which construction technique is used. Such a dramatic inconsistency raises concerns regarding the objectivity of the analysis. Additional supporting documentation regarding the cost analysis should be included in the FEIS, including a comparison to the latest cost information regarding the Mid-Currituck Bridge proposal.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years. The bridge structure components of the alternatives could potentially last longer than 50 years and perhaps up to 100 years. Fifty years, however, is the design life typically assumed in bridge planning by NCDOT. Additional support documentation related to the costs included in the SSDEIS is included in Section 2.12 of the FEIS and was presented to the Merger Team (see Section 8.10.1.2). The DEIS for the Mid-Currituck Bridge project*

(NC Turnpike Authority Project) is not complete or released for public review, so, comparable cost estimates are not available. It is presumed that the factors considered in developing Bonner Bridge replacement cost estimates will be considered in developing the Mid-Currituck Bridge cost estimates.

Comment: “The Supplement notes that newly appointed Secretary of the Interior Dirk Kempthorne wrote Senator Richard Burr a letter stating that “the best way to proceed would be to separate the replacement of the Bonner Bridge, a project whose delay could constitute a clear and present safety issue for all concerned, from the more difficult and less urgent issues of the realignment of the road.” Appendix A-2. With no supporting analysis, the letter also opines that the bridge would be “compatible” with the refuge if it is constructed within the same alignment or with minor changes to the current alignment.”

The Secretary’s letter is filled with numerous legal and factual inaccuracies (e.g., the bridge being an “imminent threat to public safety”) that suggest the NCDOT should exercise extreme caution when considering its authority. Likewise, the suggestion that the bridge can be segmented from the remainder of the roadway through the refuge not only undermines fundamental tenants of the National Environmental Policy Act analysis, but also displays a distressing lack of knowledge regarding existing, serious transportation challenges through the remainder of the refuge. The Secretary’s letter represents arbitrary and capricious agency actions, as it reverses – without any reasoned analysis – many years of consistently expressed concerns by the USFWS regarding the adverse environmental impacts associated with the short bridge alternatives and the incompatibility of these alternatives with laws governing Pea Island National Wildlife Refuge. Whatever political calculus may have been behind the Secretary’s letter, NCDOT has an independent duty to consider and disclose the full direct and indirect impacts of the proposal in the FEIS.”

Response: *The SDEIS, SSDEIS, and FEIS do not evaluate the Oregon Inlet bridge separately from the long-term maintenance of NC 12. The Phased Approach/Rodanthe Bridge Alternative (Preferred) incorporates both an Oregon Inlet bridge and additional bridges that would provide for the long-term maintenance of NC 12.*

8.12.3.2 Cape Hatteras Electric Cooperative-December 7, 2005 (page B-243)

Comment: “The Pamlico Sound Corridor and the subsequent loss of the existing transportation facilities will impose operating and financial burdens on the Cooperative that exceed the Cooperative’s ability to respond effectively without the cooperation and financial involvement of parties beyond its present customers. The cooperative does not seek to influence the choice of corridors, provided assistance is found to mitigate the extreme financial burden the long bridge will impose.”

Response: *Comment acknowledged. The costs of utility relocation were included in the overall public cost estimate, which can be found in Section 2.3.3 of the SSDEIS and Section 2.12.3 of the FEIS. The Pamlico Sound Bridge Corridor (“long bridge”) Alternative was not selected as the Preferred Alternative.*

Comment: “...For the Parallel Bridge Corridor, CHEC recognizes that replacement of the present bridge cable will be required. The cost to CHEC to install cables on the new bridge for the parallel bridge option would be approximately \$2.4 million. While this cost greatly exceeds typical CHEC electric system projects, the cooperative has long expected the requirement. Minimal changes would be necessary to the remainder of CHEC facilities within the Bridge

Replacement area for this option. The Cooperative's overhead power line would remain accessible via the remaining sections of NC 12 through the Pea Island Wildlife Refuge. Dune and road maintenance would continue to provide protection for the overhead portion of the power line. Continued maintenance of the Oregon Inlet protective groin would provide protection for the underground to overhead riser structure at the south end of the bridge."

Response: *The Phased Approach/Rodanthe Bridge Alternative, a Parallel Bridge Corridor Alternative, was selected as the Preferred Alternative.*

Comment: "For the Pamlico Sound Corridor Option, significant modification to the present transmission power line configuration would be necessary. As NCDOT abandons the present NC 12 route through the Pea Island Refuge, the critical nature of the present route would end, as would the maintenance and restoration priority of the present roadway. Should the present roadway be removed, damaged by storms or covered by drifting sand, CHEC would lose ready access to the present power line route. Washouts of the Pea Island portion of NC 12 would likely not be repaired in any timely fashion, if at all. This condition could leave the Cooperative with no location to replace its overhead facilities, resulting in extended loss of power for Hatteras and Ocracoke Island residents and visitors.

Removal of the present Oregon Inlet protective groin would create additional problems for CHEC maintaining electric service to the islands along the present route, as the riser structure at the south end of the present bridge location would be in an unstable location if the present bridge cable were replaced with an affordable relatively short submarine cable installation under Oregon Inlet."

Response: *The Phased Approach/Rodanthe Bridge Alternative was selected as the Preferred Alternative and would allow shoreline migration on Hatteras Island to continue. Power lines would thus need to be moved as the shoreline eroded. This impact is acknowledged in Section 4.12.7 of the SSDEIS and the FEIS. The costs of utility relocation associated with each alternative are noted in Section 2.3.3 of the SSDEIS and Section 2.12.3 of the FEIS.*

Comment: "Reduced maintenance or abandonment of the present corridor dictates that CHEC [Cape Hatteras Electric Cooperative] investigate more stable and viable options for its transmission line routing to replace the present route.

In response to the proposed 17 mile bridge option, CHEC undertook a study of several power line relocation options during 2004. The study yielded the following options and costs:

1. Overhead transmission line located along the side of the bridge and supported by the bridge structure: (Not estimated. NCDOT personnel indicated they would not allow consideration of this as an option).
2. Overhead transmission line supported on independent foundations adjacent to the (Pamlico Sound Corridor) bridge - \$25,510,000.
3. Submarine cables alongside the bridge - \$27,582,000.
4. Cables in conduit hung under the bridge deck - \$44,482,000..."

“...The Cooperative also in 2004 conducted a study of the impact of the options on electric rates. The impact of absorbing a project of the cost of any of the options associated with the Pamlico Sound Corridor discussed above is enormous. The total plant investment of the cooperative in facilities as of October 2005 is \$34.6 million. Even the lowest cost option available nearly doubles the present plant investment of the Cooperative. The impact of increasing plant investment by a \$25,600,000 project would require an increase in retail electric rates of over 26 percent...”

“In order to provide relief for the Cooperative should the Pamlico Sound Corridor bridge replacement option be selected by the NCDOT, CHEC requests that NCDOT take the following actions:

- A. Incorporate the proposed electric system modifications, environmental impacts and costs within the final draft of the Supplemental EIS so that concurrent approval of the necessary environmental actions will take place at minimal cost to the Cooperative.
- B. Include the CHEC portion of the overall cost of the necessary electric system modifications in the bridge replacement funding process for the Pamlico Sound Bridge Corridor option.
- C. In the case of the overhead adjacent line (option 2.), include the necessary pilings, pier caps and anchor bolt embedment for the overhead power line in the bid documents and contract for the bridge.

Cape Hatteras Electric Cooperative agrees that the replacement for the Herbert C. Bonner Bridge over Oregon Inlet is necessary. The choice of stated bridge replacement options varies greatly in the impact that will occur on the mission of Cape Hatteras Electric Cooperative in providing reliable, reasonably priced electric service. The cost and impact of the various Corridor options on the Cooperative should be considered and provided for by NCDOT in the planning, option selection, design and funding process for the bridge replacement.”

Response: *The Pamlico Sound Bridge Corridor (“17-mile bridge option”) Alternative was not selected as the Preferred Alternative. The costs of utility relocation associated with each alternative are noted in Section 2.3.3 of the SSDEIS and Section 2.12.3 of the FEIS and were examined as part of the LEDPA decision.*

8.12.3.3 Cape Hatteras Electric Cooperative-May 8, 2007 (page B-246)

Comment: “...The bridge replacement option that is finally chosen by the NC Department of Transportation could have a major impact on electric rates on Hatteras Island. The Cooperative as an organization has not taken an official position on which bridge options should be chosen, but management emphasized that it is important that customers understand the impact that the choice will have on operating costs of the Cooperative.

In the case of the “parallel” (or short) bridge, replacing the existing electric facilities with a set of cables located on the new bridge, similar to what is on the present bridge, is estimated to cost CHEC as much as \$12 million. This expenditure is projected to result in a possible rate impact to CHEC consumers of 12 percent, or about a 1.3 cent per KWH increase from 11.2 cents in 2011 to 12.5 cents per KWH in 2014, when the replacement bridge is expected to be completed.

If the “Pamlico Sound” (or 18-mile long) Bridge option is selected by NCDOT, the cost for CHEC to replace the existing cables is estimated to be as much as \$53.6 million. The long bridge

option is now estimated to result in a rate increase of approximately 42 percent, or about a 4.7 cent per KWH increase from 11.2 cents per KWH in 2011 to 15.9 cents in 2014. The actual cost replacement of the bridge itself will likely be shared at least by all the taxpayers in the state. Only the electric customers on Hatteras Island will pay the full cost of the power cable replacement. While loan funds may be available to CHEC to pay the cost of the replacement cables, the loan will have to be repaid with interest.

If the long bridge option becomes a reality, Cape Hatteras Electric Cooperative will seek grant funds to pay for the added expense, but expects a low probability that such funds will be available. There is presently no known source of grant funds available for this purpose. The rate increases cited are calculated only based on the impact of the bridge cable replacement and not any increases in wholesale power costs or other changes in the Cooperative's cost of doing business."

Response: *These concerns are acknowledged. The Pamlico Sound Bridge Corridor or "Long Bridge" was not selected as the Preferred Alternative.*

8.12.3.4 Coastal Wildlife Refuge Society-November 9, 2005 (page B-246)

Comment: "Our board of directors supports the alternative to build a 17 mile, \$419 million, bridge bypassing Oregon Inlet and the Pea Island National Wildlife Refuge as the preferred alternative. We believe that a short, less costly bridge proposed by some local interests is a very short-sighted solution which will ultimately prove to be exorbitantly more costly and life threatening.

The existing Highway 12 roadbed continues to experience substantial overwash from even minor northeasterly storms resulting in frequent closings. The high rate of ocean front erosion along Highway 12 will ultimately require the relocation of the entire right of way significantly westward which will place the highway directly through marshland and will, even to a casual observer, need to be placed on a bridge or raised causeway structure. Such relocation, if it could ever be permitted, will be extremely expensive and destroy important sensitive habitat, resulting in significant adverse impact on the wildlife in the refuge, especially to migrating waterfowl.

Always a concern on the Outer Banks, the hurricane season finds a large number of tourists on Hatteras and Ocracoke Islands. These tourists, along with permanent residents and seasonal workers, can only be evacuated over Highway 12. It is highly probable that the strong northeast storms ahead of the actual hurricane making landfall creates a distinct probability that Highway 12 will be washed out before evacuation can take place. Many people will be stranded south of the only evacuation route. Therefore, we see the "long bridge" as the best safety measure for human life and it will ultimately prove to be the less expensive, while at the same time preserving valuable habitat for wildlife.

We urge you consider these concerns in the final decision on the location of the proposed replacement Oregon Inlet Bridge."

Response: *Comment acknowledged. The reasons why the Pamlico Sound Bridge Corridor was not found to be the LEDPA are discussed in Section 2.15 of the FEIS. The Phased Approach/Rodanthe Bridge Alternative (Preferred) would place the portions of NC 12 threatened by shoreline erosion on a "raised causeway structure" in the existing easement. The associated impacts to the Refuge are discussed in Chapter 4 of the SSDEIS and the FEIS.*

8.12.3.5 *Environmental Defense-December 8, 2005 (page B-247)*

Comment: “The SDEIS states (p. 1-5, 1-6) that the purposes of the proposed project are to:

- Provide a new means of access from Bodie Island to Hatteras Island for its residents, businesses, services, and tourists prior to the end of the Bonner Bridge’s service life;
- Provide a replacement crossing that takes into account natural channel migration expected through year 2050 and provides the flexibility to let the channel move;
- Provide a replacement crossing that will not be endangered by shoreline movement through year 2050.

The NC Department of Transportation is also a partner in the Outer Banks Task Force (OBTF), whose goals are to:

- Preserve the natural barrier island system;
- Minimize impacts to Hatteras and Ocracoke islands;
- Maintain access to and on the islands so that the transportation system is safe, efficient and has minimal impact on the environment.”

Only the Pamlico Sound option meets all of the goals stated above, while all of the Parallel Bridge options would require significant alteration of the barrier island system through either beach nourishment or filling of soundside habitats. None of the Parallel Bridge options would guarantee a replacement crossing that will not be endangered by shoreline movement. Furthermore, in the event of an emergency evacuation (e.g., hurricane evacuation) of Hatteras Island, the Pamlico Sound Bridge clearly provides the safest, most reliable transportation option. The design characteristics would allow ample room for two lanes of traffic to move off the island, as well as allow for emergency vehicle access (p. 2-82, 83). The Parallel Bridge with Nourishment alternative would not provide this level of reliability and safety.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) would not include beach nourishment or filling sound-side habitats. The portions of NC 12 affected by shoreline erosion through 2060, as well as potential island breach areas in the project area, would be bridged. Note that of the Parallel Bridge Corridor alternatives considered, none placed fill in sound-side habitats, and only the Parallel Bridge Corridor with Nourishment and Parallel Bridge Corridor with Phased Approach/Rodanthe Nourishment would involve beach nourishment.*

Comment: “The SDEIS also acknowledges the highly variable maximum erosion rates at the different “hot spots” (p. 1-5) and the fact that both a storm-induced breach as well as increased erosion rates in general pose a significant risk to the Parallel Bridge alternatives (p. 2-74). These are quite realistic and likely risks that would increase both costs and environmental impacts. Moreover, the SDEIS states that the coastal modeling that was performed did not include cross-shore and long-shore changes in transport that could occur should a breach be allowed to remain open. This creates the question of how this would impact the Parallel Bridge “Road North/Bridge South” and “All Bridge” alternatives with regard to design characteristics that could withstand such change.”

Response: *Neither the Road North/Bridge South nor the All Bridge alternatives were selected as the Preferred Alternative. From the perspective of the Phased Approach/Rodanthe Bridge Alternative (Preferred), in the event of a breach that is allowed to stay open, the model used to predict the high erosion scenario would not be expected to predict shoreline change in the vicinity of the new inlet. It is well documented that shorelines in the vicinity of an inlet often exhibit both greater shoreline change rates (either erosion or accretion) and a greater variance with respect to time than shoreline segments at some distance from an inlet. The alongshore distance of impact of the inlet can be as much as 0.5 to 1.0 mile (0.8 to 1.6 kilometers) on either side of the inlet. The shoreline adjacent to the new inlet will adjust in response to the configuration of the new inlet, the hydrodynamics of the new two (or more) inlet system, the underlying geology, and the sediment supply.*

The impact of a breach on the Phased Approach/Rodanthe Bridge Alternative (Preferred) design would be one of location as opposed to structural integrity. Bridges across potential breach areas would be designed to withstand the hydrodynamic forces and resulting scour that breach exposure would create. The location issue involves determination of which areas would need to be bridged and in what sequence. Four of the five potential breach locations would be bridged in Phase II. The fifth is proposed for bridging in Phase III. Additional studies on the extent of potential breach locations would be conducted prior to building each phase to help ensure that their endpoints take into account the outer edges of potential breach areas. Modeling of the hydrodynamics and shoreline response of the barrier with two or more inlets (assuming likely inlet locations) could prove useful insights to future behavior. The plan to monitor future shoreline position, as well as the evolving geomorphology of the island, and to adaptively respond to future change is a strength of the implementation planning approach.

Comment: “Finally, the draft Section 4(f) evaluation states that “it could be concluded that either alternative [Pamlico Sound Bridge or Parallel Bridge] minimizes harm, or it could be concluded that while different in the type of harm, they are equal in the degree of harm.” We firmly believe that in no way can it be concluded that any of the Parallel Bridge options are “equal” to the Pamlico Sound bridge options in the degree of harm posed, or that they “minimize” the harm posed. Rather the Parallel Bridge options all pose significantly greater harm in one aspect or another, whether that is harm to natural resources or risks to safe and reliable transit.”

Response: *The statement on page 5-41 of the Draft Section 4(f) Evaluation in the SDEIS acknowledges the differing positions on the importance of road access to the Refuge expressed by the full range of stakeholders in the project area, including the public and local government officials.*

Comment: “Table 2-9, which details the construction and maintenance costs of each of the Parallel Bridge and Pamlico Sound Bridge options to the year 2060 is faulty in that it should be projected for an additional 50 years. The SDEIS states that either of the bridge options and their components would conceivably have a lifespan of 100 years (p. 3-39, 3-43). Given the controversy surrounding the costs of the Pamlico Sound Bridge as compared to the Dare County preferred option of a Parallel Bridge with Nourishment, the potential costs of nourishment should be projected on a timeframe that is comparable to the life expectancy of the bridge components. The public has a right to know the maximum costs that would be incurred.”

Response: *The design life assumed for alternatives in the SDEIS and SSDEIS was 50 years, although the bridge structure components of the alternatives could potentially last longer than 50 years and perhaps up to 100 years. Fifty years, however, is the design life typically assumed in bridge planning by NCDOT.*

Comment: “In addition, Dare County officials have indicated their concern that anything except a Parallel Bridge option could substantially impact the local economy due to changes in access to PINWR. However, the SDEIS indicates that the Pamlico Sound option would not have a significant economic effect, as evidenced by the statement that lost visitor expenditures would be approximately 10% of current expenditures (p. 4-11), while losses to Dare County in tax receipts would constitute only 2.5% of the total. It should also be noted that the potential economic losses due to a storm-induced breach of NC12 with the Parallel Bridge with Nourishment alternative range from \$5.7million to 146.7million. These figures alone provide support for the Pamlico Sound bridge alternatives from a strictly economic sense. Therefore, the safe and reliable transit provided by the Pamlico Sound alternatives would certainly offset the loss of 2.5% of the Dare County tax receipts.”

Response: *The commenter’s observations are noted. No response is required.*

Comment: “As noted in the SDEIS, the NC Division of Marine Fisheries (DMF) and Marine Fisheries Commission (MFC), as well as the South Atlantic Fishery Management Council (SAFMC) and Mid-Atlantic Fishery Management Council (MAFMC) manage fishery resources within the project area. Both the NC Marine Fisheries Commission and the SAFMC have habitat protection policies regarding, the use of beach fill and impacts to fish and fish habitats (attached). Section 4.7.6 acknowledges the potential adverse indirect impacts to fisheries of the Parallel Bridge with Nourishment alternative, mostly due to turbidity and impacts to benthic food resources. It also briefly states (p. 4-67) the risks associated with frequent dredging (every four years or less) and beach fill to benthic invertebrates. Given the tremendous importance of recreational and commercial fisheries to the project area, and the feasible alternative of the Pamlico Sound bridge alternative, the risks to state and federal fishery resources by the Parallel Bridge alternatives are not warranted.

Furthermore, the MFC also has a policy regarding the protection of Submerged Aquatic Vegetation (attached), which is a key nursery and foraging habitat for many recreationally and commercially important finfish and shellfish species. It should be noted that SAV is also one of the six major fish habitats identified in the state’s Coastal Habitat Protection Plan (CHPP), the goal of which is to ensure long-term enhancement of coastal fisheries associated with each habitat. The development of the CHPP was a mandate of the 1997 NC Fisheries Reform Act, and is the first comprehensive ecosystem-based management plan on the Atlantic seaboard. A unique feature of the CHPP is that the Coastal Resources, Marine Fisheries and Environmental Management Commissions are to adopt and implement the plan. Adoption occurred in December 2004 and implementation plans are currently underway. A comprehensive set of management recommendations for the protection and enhancement of the six habitats identified is included in the CHPP and can be found at <http://www.ncdmf.net/habitat/index.html>. Only the Pamlico Sound bridge alternatives meet the goals and recommendations of the CHPP.”

Response: *Position acknowledged.*

Comment: “Section 4.12 (Indirect and Cumulative Impacts) is sorely lacking in that it makes no mention of the cumulative and long-term effects to natural resources posed by the Parallel Bridge with Nourishment alternative. To our knowledge, no long-term or cumulative impacts studies

exist to document the effects of repeated beach nourishment, both from a sand placement perspective and a dredging perspective. The potential long-term impacts of nourishment activities are only briefly mentioned in Section 4.7.6. The proposed project has a minimum expected lifetime of 50 years, yet no monitoring program is proposed, should the Parallel Bridge with Nourishment alternative be chosen. Given the significant potential impacts of this alternative to fish, benthic invertebrates and shorebirds, a draft monitoring plan (pre- and post-construction) should be included in the SDEIS. Although recovery may be evident within 1-3 years of sand dredging or emplacement, many benthic invertebrate populations have seasonal and interannual variability that will not be captured by a three year study. Proponents of beach fill often cite an Army Corps of Engineers seven year study of New Jersey's Sandy Hook to Barnegat Inlet nourishment project as evidence of no long-term impacts. In the context of a 50-year project, seven years is by no means "long-term". An example of a potential pre-project monitoring plan that is currently underway is that for the Dare County Beaches - Bodie Island (North) project."

Response: *The long-term effects, including natural resource impacts, of the nourishment alternatives are considered as direct impacts because they are associated with the project, which includes all rounds of nourishment dredging. An alternative involving nourishment dredging was not selected as the Preferred Alternative.*

Comment: "A concern of all interested in the Bonner Bridge replacement project is the potential impact of stormwater runoff, particularly from the Pamlico Sound bridge alternatives. Very little mention of stormwater impacts is made in the SDEIS, other than that NC DOT would examine possible best management practices to control stormwater (p. 2-82). Opponents of the Pamlico Sound Bridge claim that the stormwater runoff from a 17-mile long bridge would be a significant source of pollution. However, most stormwater runoff in urban areas collects pollution from sources such as herbicides, pesticides and fertilizers which are placed on land adjacent to roads. Environmental Defense requests that a comparative stormwater analysis be performed to answer the following questions: What contaminants are currently in the stormwater runoff along the portion of NC12 in the study area? What impact does the number of vehicles parked along NC12 during peak tourist season have on stormwater (e.g., dripping oil, coolant, other fluids)? What does the current level of maintenance and repair of NC12 contribute to the contaminants in stormwater? What types of stormwater collection systems have been used in other long bridge construction projects? Public Access Environmental Defense firmly supports continued public access to PINWR. Visitor surveys indicate that 60% of current visitors would continue to visit the refuge, even if access is no longer by means of a paved road. The U.S. Fish and Wildlife Service (FWS) has committed to providing continued public access to PINWR, and Environmental Defense requests that the FWS establish a working group to determine the most feasible means of maintaining such access. It should be noted that North Carolina has other remote coastal recreational areas (Cape Lookout National Seashore, Hammocks Beach State Park, etc.) that are accessed by means other than a paved road, and which have high levels of visitation during the tourist season."

Response: *Additional material related to water quality impacts for all detailed study alternatives and approaches to handling storm water on the bridges is included in Section 4.7.2 of the FEIS. The USFWS has indicated that they would prepare a future access plan if the Pamlico Sound Bridge Corridor was selected. The Preferred Alternative, however, provides access to the Refuge both at the northern end of the Refuge and via a 2.1-mile (3.4-kilometer) section of existing roadway.*

Comment: “In sum, it must be stated that there exists no perfect solution to the issue of safe, reliable transit over Oregon Inlet and the future of NC12 on Hatteras Island. None of the alternatives presented meets all needs with regard to safety, reliability, economic feasibility, public access and avoidance of environmental impacts. However, when all factors are balanced, and the requirements of both NEPA and Section 4(f) of the Department of Transportation Act are considered, the Pamlico Sound Bridge alternatives present the best solution to all of these issues, save access, which the USFWS has committed to address. For these reasons, Environmental Defense supports the Pamlico Sound bridge replacement corridor and requests that a working group be.”

Response: *The position of the commenter is noted. The Phased Approach/Rodanthe Bridge Alternative (Preferred), which was presented in the SSDEIS that was released after the receipt of this letter, also avoids impacting the Refuge from a Section 4(f) perspective because it would remain within the existing NC 12 easement through the Refuge. The FHWA also has determined that no constructive use would occur to the Refuge by the Preferred Alternative. As indicated in Section 2.10.2.5, NCDOT would not perform storm-related NC 12 maintenance work outside the existing easement in the Phase III, IV, and no action areas on NC 12.*

8.12.3.6 Environmental Defense-April 17, 2007 (page B-256)

Comment: “The Supplement states Phase II, III, and IV would be constructed post-2013, post 2020 and post-2030 respectively (with the exception of the beach fill included in the Rodanthe Nourishment alternative); it also states that construction would occur in locations where a breach is likely or where the distance between the active shoreline and NC 12 is predicted to be less than the buffer distance of 230 feet by one of the above dates. However, oceanfront erosion does not always occur at a steady, long-term erosion rate. On the Outer Banks, erosion is far more likely to occur in a punctuated fashion as a result of hurricanes and nor’easters. These erosion-inducing events could easily result in the active shoreline being within the 230 foot buffer distance to NC 12 sooner than predicted, i.e., before 2013, 2020, or 2030. If such a situation were to occur, would NCDOT proceed with phased bridge construction in the affected area as stated in the Supplement or would other measures (i.e., beach fill) be used to increase the buffer width between NC 12 and the active shoreline to 230 feet? Furthermore, would beach fill continue to be used until the 2013, 2020, or 2030 dates are reached?”

Page 2-4 of the Supplement states “...if a storm related breach were to occur, or if shoreline erosion accelerated or decelerated in a particular location, implementation of any individual phase could be accelerated or delayed.” However, a set of specific decision-making criteria regarding exactly when and under what conditions construction of the bridges in Phases II-IV would occur needs to be established. In the absence of such criteria, actual construction under the Phased Approach alternatives could be delayed indefinitely resulting in a de-facto Parallel Bridge w/Nourishment alternative. As detailed in our 12/8/05 comments on the SDEIS, Environmental Defense strongly objects to the Parallel Bridge w/Nourishment alternative as it results in unacceptable cumulative and long-term impacts to natural resources and fails to meet the needs of providing safe and reliable transportation.”

Response: *A monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS. The implementation of any phase also is dependent upon adequate funding. The Parallel Bridge Corridor with Nourishment Alternative was not selected as the Preferred Alternative, nor is “de-facto” nourishment proposed.*

Comment: “Page xxvii (‘Project Commitments’) the Supplement states that the life expectancy of a replacement bridge is estimated to be as long as 100 years. Environmental Defense strongly believes that a true accounting of the costs associated with the various alternatives should be calculated on a timeframe comparable to the life expectancy of the bridge, rather than the artificial project endpoint of 2060. We made a similar statement in our comments on the SDEIS. Given that substantial public funds will be used for construction, the public should be informed of the maximum costs that could be incurred. Should NCDOT determine that use of additional beach fill is necessary in a scenario such as that described in the paragraphs above, those costs need to be factored into the Phased Approaches. Finally, we request additional information regarding the cause for the apparent non-linear increases in per-square foot construction costs between the SDEIS and this Supplement.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years, which is the typical design life NCDOT assumes for bridge projects. This is also why 2060 was selected as the project endpoint. The bridge structure components of the alternatives, however, could potentially last longer than 50 years and perhaps up to 100 years. Beach fill is not a component of the Phased Approach/Rodanthe Bridge Alternative (Preferred). Section 2.3.1.2 of the SSDEIS and Section 2.12.1.2 of the FEIS identify the reasons for the increases in costs between the SDEIS and the SSDEIS.*

Comment: “While the direct wetland impact from the phased alternatives has been evaluated to be relatively small, in part due to potential natural wetland infill from sand movement within Pea Island National Wildlife Refuge (PINWR), the total temporary and permanent biotic impacts (which include wetland impacts) from construction of either of the phased approaches are not insignificant (48.5 acres temporary biotic impact, Supplement, p.4-30). While much of the impact might be “temporary”, the magnitude of that effect on the biota and general ecology of the Refuge can be exacerbated by the timing of such “temporary” impacts. The Supplement does not adequately evaluate this.

Response: *Both the permanent and temporary wetland impacts associated with the Phased Approach/Rodanthe Bridge Alternative (Preferred) would be mitigated under the requirements of Section 404 of the Clean Water Act.*

Comment: “Additionally, the phased alternatives present a likely adverse impact to federally endangered populations of both piping plover (Supplement, p.4-37) and green sea turtle (Supplement, p.4-38). We disagree with the biological conclusion in the Supplement of “Unresolved” for both of these species. While shoreline erosion may indeed create piping plover habitat under future bridges (Supplement, p.4-38), the lack of conclusive information regarding disturbance impacts from vehicle noise warrants a precautionary approach, and therefore a conclusion that the Phased Approach alternatives are likely to adversely affect the species. A similar precautionary approach and conclusion is warranted for the green sea turtle as well, given the certain impacts of bridge piles on nesting habitat quality as well as potential construction impacts. Finally, the Supplement erroneously concludes that the Phased Approach would not likely adversely affect loggerhead sea turtles, based on observations from 2003 and 2004 (Supplement to SDEIS, p. 4-39). The area should be re-evaluated before making such conclusions. The certain and potential impacts described for green sea turtles above also apply for this species.”

Response: *For the Phased Approach/Rodanthe Bridge Alternative (Preferred), FHWA and NCDOT has completed formal consultation with the US Fish and Wildlife Service*

under the requirements of Section 7 of the Endangered Species Act of 1973, as amended. Its findings are presented in Section 4.7.9 of the FEIS.

Comment: “The eventual result of the Phased Approaches alternatives will be several bridges in the ocean. While the immediate impacts of construction from Phases II-IV are unlikely to directly impact nearshore fish species and habitats, the long-term and cumulative impacts to these resources—as well as nearshore benthic communities—as erosion moves the bridges into the ocean is not considered in Section 4.12 of the Supplement. Given the discussion in Section 4.6.3 of the Supplement regarding the impact of scour from the Phased Approach alternatives on the local bathymetry and wave climate, and potentially longshore sediment transport, this is a significant omission. These are all characteristics which impact benthic community structure, and potentially resident fish species. While changes may be gradual in nature, this does not mean that they will be insignificant. Alteration of habitat structure for fauna at the base of the food chain can have cascading ecological impacts that should be acknowledged, particularly given the importance of fishing and tourism activities (e.g., birding) on the local economy. In order to adequately evaluate the Phased Alternatives an accounting of these cumulative and long-term impacts is necessary.”

Response: *In response to this comment, FEIS Section 4.7.3.2 includes a discussion of changes in the relationship of the Phased Approach/Rodanthe Bridge Alternative (Preferred) with the shoreline and its biotic communities. NCDOT and FHWA consider these impacts to be direct impacts, not indirect and cumulative impacts, since they are directly associated with the proposed action.*

Comment: “As discussed in section Sections 4.3.2 and 5.2.2 of the Supplement, the Phased Approach alternatives represent a substantial visual impact to the Refuge, and indeed, would permanently alter the undeveloped and protected character of the Refuge which makes it a unique national treasure. Furthermore, the Phased Approach alternatives provide the most restrictive access of any of the Parallel Bridge Corridor alternatives (Supplement, p. 4-5, 4-6, 5-8). Environmental Defense strongly supports continued access to the Refuge and points out, as we did in our comments on the SDEIS, that access to other public trust areas in the state is maintained without a paved road such as NC 12. Finally, the limited public access provided by the Phased Approach alternatives would not only adversely affect Refuge resources, but would also severely impact recreational activities such as fishing, hiking, birding and particularly surfing. These impacts alone make the Phased Approach alternative incompatible with the purpose and mission of the Refuge.”

Response: *These concerns are acknowledged. The Phased Approach/Rodanthe Bridge Alternative (Preferred), however, is the LEDPA for the reasons presented in Section 2.15 of the FEIS. As with the Pamlico Sound Bridge Corridor, the USFWS could provide additional access without the use of a paved road with the Phased Approach/Rodanthe Bridge Alternative (Preferred).*

Comment: “The Phased Approach alternatives do not appear to provide a safe and reliable means of transportation, which is of paramount importance. Overwash and flooding will continue to be an issue with these alternatives. Additionally, the eventual location of bridges in the ocean that are 25 feet above mean high water will not provide safe transit during the frequent storm events which impact Hatteras Island. The Pamlico Sound alternative will provide significantly safer transit during storm events, as it would be in the lee of the island with less direct exposure to storm winds and at a lower elevation of 10 feet above mean high water. The Long Bridge Operations and Safety Study Report (Parsons Brinckerhoff Quade & Douglass, June

2006) indicated that crash rates on North Carolina long bridges tended to be low and in fact were lower than crash rates observed on statewide two and four lane roads. In addition, the crash rates for long North Carolina bridges corresponded closely with the crash rates calculated for the Chesapeake Bay Bridge Tunnel, which consists of a 15.5 mile long bridge and 2.1 mile long tunnel. Based on the data we maintain that the Pamlico Sound Bridge alternative will provide the safest and most reliable transportation to and from Hatteras Island.

As stated in our previous comments on the SDEIS, none of the alternatives presented meets all needs regarding safety, reliability, economic feasibility, public access and avoidance of environmental impacts. Based on the information contained in the Supplement, Environmental Defense maintains that the Pamlico Sound Bridge alternative still presents the best solution when all of the factors above are considered and balanced.”

Response: *These positions are acknowledged. The findings of the Long Bridge Operations and Safety Study Report are summarized in Section 2.8 of the FEIS. Its findings related to weather and crash rates apply to the Phased Approach/Rodanthe Bridge Alternative (Preferred), in addition to the Pamlico Sound Bridge Corridor.*

8.12.3.7 North Carolina Coastal Federation-December 9, 2005 (page B-261)

Comment: “Bonner Bridge connects with Highway 12 at the Pea Island National Wildlife Refuge, an undeveloped piece of Land set aside by federal law as habitat for wildlife. Pea Island must be allowed to function as a natural system. Because barrier islands migrate, maintaining a highway from Oregon Inlet to Rodanthe poses especially difficult challenges. While beach renourishment and dune building may be acceptable on some barrier islands where human settlement is present, Pea Island is a wild, undeveloped barrier system and must remain so. This is not simply a desire on the part of NCCF, but a requirement under federal law.”

According to the designs set forth in the draft EIS, the only alternative that meets the criteria outlined above is the Pamlico Sound Bridge. In addition, the Pamlico Sound Bridge would be designed to last a hundred years. This is far beyond the capacity of an on-the-ground road through Pea Island, which will likely be disrupted by erosion after 50 years, at most.

The Parallel Corridor, all roads, can only be maintained through a program of beach nourishment and dune building that is unacceptable. Halting barrier island migration is difficult on any shoreline. On Pea Island, it will be impossible without extreme engineering tactics that are inappropriate for a wildlife refuge. These include the closure of breaches or inlets that open as the island continues to migrate. The flushing of tidal waters through ocean cuts is an important component of water quality. Any cuts that occur on Pea Island before 2060-and scientists agree that they will occur-must be allowed to remain open and function naturally, without hardened structures or fill. In addition, beach renourishment would produce turbidity plumes in ocean waters and would kill millions of tidewater invertebrates on which fish and migrating birds depend for food. Building dunes of 10 and 20 feet, as described in the DEIS, would hasten, beach erosion and cause sand to be lost from the system as the ocean washes it out to sea. The west bank of Pea Island is already starved for sediment because of the dune building that has occurred over the past seventy years. This has led to extensive loss of wetlands; in fact, shoreline surveys show that the refuge has decreased in land mass from 5,900 in 1935 to only 5,000 acres today. Dune building within the refuge must be stopped. Such engineering tactics will become increasingly necessary as sea level rises. For these reasons, the Parallel Corridor, all road, is unacceptable.”

Response: *An alternative involving nourishment was not selected as the Preferred Alternative, and it should be noted that the road component of the Parallel Bridge Corridor with Road North/Bridge South or All Bridge Alternatives does not involve nourishment because of its placement west of the 2060 high erosion shoreline. The phasing scheme for the Phased Approach/Rodanthe Bridge Alternative (Preferred) assumes that four of the five potential breach locations are bridged during Phase II, including the area at Rodanthe where a breach is most likely to occur. It is NCDOT's intent to place a high priority on the implementation of Phase II as soon as it is practicable. The fifth location (former New Inlet area) would be bridged during Phase III.*

Comment: “In reviewing the draft EIS, we were hopeful that the Parallel Corridor, Road North/bridge South or All Bridge options might provide a viable alternative that would allow public access while enabling the island to behave naturally. However, as described in the draft EIS, all alignments of the Parallel Corridor would involve intensive management of the island, including the immediate closure of any breaches or inlets that open in Pea Island. These alternatives would also continue the current practice of using dune building or beach renourishment on portions of the road that may be threatened as the island migrates, including the Canal Zone on the north end. For these reasons, the Parallel Corridor as described is unacceptable.

According to the options set forth in the DEIS, then, the Pamlico Sound corridor is the only acceptable alternative. It would avoid dune building, beach renourishment, and the closure of ocean breaches. It is also the only alternative that would meet the requirements necessary to receive federal permits under the Clean Water Act. But it would prevent the public from having the easy access to Pea Island it currently enjoys, and on which Dare County officials insist.

It should be noted that the alignment of the bridge and Highway 12 has been the subject of long discussion between the state and federal resource agencies (the Merger Team) charged with protecting public safety and the refuge. The Pamlico Sound corridor was endorsed unanimously by Merger Team members. Other corridors were considered, but problems were found with each. Routings that would have taken the road through the wildlife ponds were deemed unacceptable because of the large amount of wetlands that would be destroyed and the destruction of refuge facilities. Nonetheless, NCCF believes that because of the high degree of public opposition to the long bridge, alternative routes should be placed back on the table.

The Dare County Commissioners are on record as opposing the Pamlico Sound corridor for two reasons. First, the Pamlico Sound route would remove the need for the terminal groin on the south end of Oregon Inlet. The commissioners want the groin to remain in place to help stabilize the channel through the inlet. Second, the commissioners fear the Fish and Wildlife Service (FWS) intends to limit public access to the refuge. They demand that the refuge remain easily open to visitors.

NCCF believes it may be possible to work out a compromise that would leave the terminal groin in place and align a series of bridges and roads through the refuge designed to let the Island migrate naturally. We suggest that consideration be given to building a bridge through the northern part of the refuge, with the understanding that it would be engineered to withstand tidal surge. Any breaches or inlets would be allowed to remain open. No dune building or beach renourishment would be allowed. A public access point could be included for the north end. A problem with this suggestion is that it would likely require the road to be moved west from its present location through the north portion of the refuge, into sensitive wetlands with high wildlife

value. If so, it would have to be constructed using the more expensive “top-down” construction method, leapfrogging forward a section at a time, to minimize damage to the wetlands. This is essential. Even with top-down construction, mitigation would be required. While it is highly unusual for us to endorse a proposal that would destroy wetlands, we are convinced that the barrier island system, including wetlands and Submerged Aquatic Vegetation, will quickly recover once DOT stops building dunes and moving sand to protect Highway 12.

In the middle portion of the refuge, engineers could align a bridge to follow the current route of the dikes that now form the west wall of the waterfowl impoundments. In the past refuge management has voiced concern about the potential destruction of the wildlife ponds and the disturbance of having vehicles pass too close to feeding, resting, and nesting birds. County officials have countered that the wildlife ponds are heavily manipulated, and therefore not natural habitat. NCCF believes it may be possible to build a bridge to replace the western dikes, reducing wetlands destruction and leaving the middle part of the island undisturbed for wildlife. At the same time, the wildlife ponds could be reconfigured and opened to tidal flushing, thus more closely mimicking a natural estuarine system. If carefully planned, this compromise could restore components of the natural system while allowing a bridge to remain within the refuge.

FWS management says it does not have the funds for such an extensive reengineering of the refuge ponds. It would fall on the state to design and construct a roadway and the surrounding landscape features to meet both its needs and those of the FWS. While this would be highly unusual, we believe it would be much less expensive than nourishing the beaches of Pea Island and closing breaches for the life of the Parallel Corridor. It would certainly be less damaging to water quality and the barrier island system. And it would increase fisheries habitat.

South of the wildlife ponds, a bridge across New Inlet could be tied into the portion of the road that is not currently threatened by erosion. This would reduce the cost of the project. Public access to beaches could be provided in the New Inlet area and south. A bridge would again be required north of Rodanthe, in the S-curves area.

This suggestion corridor is only one of several potential routings that could serve as a compromise. Others include landing a bridge near the northwest corner of North Pond and proceeding south along the dikes. It appears from the maps in the DEIS that such a routing would avoid major beds of Submerged Aquatic Vegetation, but careful surveys would need to be conducted.

Finally, in our conversations with local officials and residents, it has become clear that the favorite public destination point is the north end of the refuge. If another compromise cannot be reached, the simplest solution would be to build the Pamlico Sound corridor with a spur to the north end. The terminal groin could be left in place. (Refuge management has indicated that it might accept leaving the groin in place, if DOT would agree to occasionally spread sand on its south side to maintain habitat for beach-nesting birds.) A spur for providing access to the north end could be included in other road alignments as well.

As a public document, the draft EIS falls short in not examining ways in which the two opposing camps—those who favor the Parallel corridor and those who favor the Pamlico Sound corridor—might be brought together. We intend this only as a starting point from which discussions can move forward. But it is clear to us that policy makers must examine more alternatives than those presented in the draft EIS, and that they must do so quickly. We urge DOT, the resource agencies, and the officials of Dare County to make a sincere and creative effort to find compromises that will satisfy parties on both sides of the issue.

In closing, everyone involved in this decision should recognize that there is no inexpensive, easy solution to this problem-because there is no cheap, impact-free way to maintain a major transportation corridor down a shifting barrier island. Provisions must be made for the changeable nature of the landscape.”

Response: *FHWA and NCDOT appreciate the commenter’s desire for a compromise solution and the additional suggestions. Regarding the commenter’s specific suggestions, the Phased Approach/Rodanthe Bridge Alternative (Preferred) would not involve beach nourishment or dune maintenance. As suggested by the commenter, it would involve a bridge in the northern part of the Refuge with an access point at the northern end of Hatteras Island. However, it would remain in the existing NC 12 easement, minimizing wetland impacts. A bridge also is included in the middle of the Refuge as suggested by the commenter. Natural erosion, however, would affect the ponds. A bridge also is placed in the New Inlet and Rodanthe areas as suggested by the commenter. The merits of an access ramp from the Pamlico Sound Bridge Corridor to the north end of Hatteras Island are discussed in Section 2.5.3 of the SDEIS and the FEIS.*

8.12.3.8 North Carolina Coastal Federation-April 16, 2007 (page B-263)

Comment: “Our comment letter from 2005 read in part: Bonner Bridge connects with Highway 12 at the Pea Island National Wildlife Refuge, an undeveloped of land set aside by federal law as habitat for wildlife. Pea Island must he allowed to function as a natural system. Because Barrier Island migrates, maintaining a highway from Oregon Inlet to Rodanthe poses especially difficult challenges. While beach renourishment and dune building may be acceptable on some barrier islands where human settlement is present, Pea Island is a wild, undeveloped barrier system and must remain so. This is not simply a desire on the part of NCCF, but a requirement under federal law.

The letter further suggested that DOT explore moving part of Highway 12 to the west side of the refuge, perhaps along the dikes that form the west wall of the wildlife impoundments. The dikes could be replaced by bridges, restoring the natural tidal flushing of the ponds while allowing public access. We continue to believe that this alignment or one like it would provide a reasonable compromise to the impasse over the Bonner Bridge replacement. However, in later conversations with representatives of the U.S. Fish and Wildlife Service (FWS) it became clear to us that they were not willing to explore this option. They told us it was not likely to be compatible with the mission of the refuge under the 1997 National Wildlife Refuge Improvement Act. To our disappointment, discussion of the alternative was dropped. We continue to believe that this option might provide a reasonable solution to an unusually sticky problem.

For the current public comment period on the supplemental draft EIS, we feel compelled to reiterate the following points:

- Beach renourishment on a large scale is not acceptable within a national wildlife refuge. Whatever alternative is followed, Pea Island must be allowed to function as a natural barrier island. Thus, the parallel corridor with the beach renourishment option should be removed from consideration.
- The constant construction of high dunes on the east side of Highway 12 is thwarting the natural migration of the barrier island and causing sand to be washed out to sea. As a result,

Pea Island is becoming more and more unstable. Thus, dune building as outlined in the supplemental DEIS should be removed from consideration.

- If a bridge is constructed in the Canal Zone portion of Highway 12, within a few years the highway will encroach on the beach, simply because of the unusually high rate of erosion in this stretch (11 to 12 feet a year, 1998 maps). It is impractical to think otherwise. Instead of taking a stroll on a peaceful, deserted strand, visitors could lay out their towels beneath a highway carrying thousands of cars a day. Is this really what DOT intends for Pea Island?
- The alternative that includes relocation of Highway 12 slightly to the west along the wildlife ponds is not likely to be found compatible with the National Wildlife Refuge Improvement Act. If this option is feasible, why not move the road to the far west side of the island?
- In choosing an option, it is vital to recognize the true costs of maintaining Highway 12 through 2060, as summarized on page vii of the document and elsewhere. Even the least expensive options far exceed the money currently available in DOT coffers.
- While the cost of the Pamlico Sound corridor, \$1.3 billion to \$1.8 billion, is higher than other options, it should be recognized that the Pamlico Sound bridge has a life expectancy of 100 years, twice as long as the Parallel Bridge and its various options for passage through Pea Island.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) would not involve beach nourishment or dune maintenance. The visual impacts associated with the alternative are discussed in Section 4.3.2 of the SSDEIS and the FEIS. An alternative immediately west of Hatteras Island is considered and discussed in Section 2.3 of the SDEIS and the FEIS. Like the Pamlico Sound Bridge Corridor, it is not practicable because its full length would have to be built from Bodie Island to Rodanthe and funds are not available to build a single project of that length. Also, unlike the Pamlico Sound Bridge Corridor, it would be placed in an area likely to contain submerged aquatic vegetation (SAV). The Pamlico Sound Bridge Corridor was placed to minimize SAV impacts.*

The design life assumed in the SDEIS and SSDEIS was 50 years. The bridge structure components of the alternatives could potentially last longer than 50 years and perhaps up to 100 years. Fifty years, however, is the design life typically assumed in bridge planning by NCDOT.

Comment: “With the above considerations, we do not believe that the options laid out in the supplemental DEIS are suitable for the landscape of Pea Island or the political climate of Dare County. However, it may be possible to amend the designs of both the short bridge and long bridge to make them work. Our suggestions are as follows:

1. If the Pamlico Sound Corridor (long bridge) option is selected, access ramps should be provided to allow public access to Pea Island. A ramp might be brought in at the north end of the wildlife refuge. A second ramp might be designed to provide access to the beautiful beaches on the most stable section of Pea Island, between New Inlet and the S curves. We recognize that the ramps would add significantly to the cost of the project. However, this solution would allow the island to remain natural, provide reliable transportation to Hatteras through the 21st century, and meet the access goals of the local community.

2. If the Parallel Corridor (short bridge) is selected, DOT should work with FWS to find a route for Highway 12 on the west side of the refuge that will meet the three goals (natural island migration, reliable transportation, public access) while also meeting the management needs of the FWS. The route currently proposed through Pea Island places the natural beauty of Pea Island at risk and will force DOT into a losing battle against the ocean. We call on both DOT and FWS to negotiate in good faith on this point, and to view mitigation of impacts as an opportunity to return the wildlife refuge to a more natural landscape.

Finally, NCCF does not believe that DOT can realistically expect to maintain Highway 12 through Pea Island as designed and described in the EIS. Any beach as dynamic as that on Pea Island is a poor candidate for renourishment projects. The technical capacity of DOT to protect the road over the long run is limited and will always be, even if money were no object. If the parallel bridge is built and DOT attempts to keep Highway 12 in or near its current location, state officials and local residents should anticipate frequent disruption of highway services to Hatteras Island.”

Response: *The merits of an access ramp from the Pamlico Sound Bridge Corridor to the north end of Hatteras Island are discussed in Section 2.5.3 of the SDEIS and the FEIS. As noted by the commenter, such a ramp would be a costly addition to already expensive alternative. The “Bridge South” component of the Parallel Bridge Corridor with Road North/Bridge South Alternative is a bridge from Rodanthe and the most stable section of Hatteras Island. It would require a section of new easement within the Refuge and like the alternative of which it is a part, not likely to be found compatible with the Refuge. Given Section 4(f) of the Department of Transportation Act of 1966, the requirements of the National Wildlife Refuge Improvement Act (under which a determination of non-compatibility cannot be mitigated), and funding availability, the Phased Approach/Rodanthe Bridge Alternative (Preferred) is the LEDPA. Once complete, the portions of NC 12 threatened by beach erosion prior to 2060 will be on a bridge.*

8.12.3.9 NC Sea Grant-December 12, 2005 (page B-264)

Comment: “In recognition of the intense development that has occurred and is continuing along the Nation’s coastal barrier beaches and the special place that our Dare County Outer Banks and the adjacent inland sea of Pamlico Sound represents in the hearts of North Carolinians and the Nation, we urge that the options chosen for bridge replacement and highway 12 alignment preserve the unique environmental, cultural, and social heritage of this region. Natural areas like Pea Island and the Pamlico Sound provide ecosystem and human services that sustain not only fish and wildlife, but our lifestyles and coastal economy. These systems are also important for the rare opportunities they offer for humans to be engaged in a wild beach system. Thus, we urge care in replacement of this bridge and road so as to allow these natural areas to continue to function in a natural manner, while providing access for residents and visitors to enjoy the natural wonders of our Outer Banks.

We recognize that the maintenance of public vehicular access to Hatteras Island has become highly controversial. Two primary options are being considered. The first, supported by most public officials, involves a parallel replacement to the existing Bonner Bridge, combined with Highway 12 maintenance in its current alignment. This option addresses concerns over access to Pea Island and its natural attractions. However, most environmental advocates strongly prefer that access to Hatteras Island be provided by a 17-mile bridge span routed through the Pamlico Sound to avoid negative impacts to wildlife in the Pea Island refuge. Unfortunately, this option may not provide adequate public access to the refuge and will have negative impacts on Pamlico Sound.

Our review of this controversy and the scientific literature available on similar projects leads us to conclude that a compromise solution that can address both goals of environmental preservation and public access is undoubtedly desirable and possible. We would like to suggest that a variation on the Parallel Corridor, Road North/Bridge South may represent the basis for just such a compromise alternative.

One possible alternative would involve the coupling the short bridge with an alignment and design of Highway 12 that includes techniques to avoid certain especially damaging construction and landscape maintenance practices. For example, dredging and filling, channelization, and wetland destruction should be avoided as much as possible. Also “top-down” construction techniques, as noted on several bridge construction projects in Louisiana, provide opportunities to reduce construction impacts on environmentally sensitive areas associated with dredging, channelization, and soil compaction from heavy construction equipment. Impacts from runoff associated with long bridge spans can be minimized using stormwater devices and techniques that treat and disperse the discharge. Importantly, the road alignment must not use techniques that include causeways or dikes that block water flow and impede circulation, flushing, and passage of fish and other marine organisms are critical to maintaining production of ecosystem goods and services. Additionally, upon occasion, projects that improved flushing helped enhance SAV densities in protected bays.

Using the parallel short bridge option, there would be no additional area of the Pamlico Sound newly impacted to provide access to Hatteras Island. If this short bridge option is coupled with an alignment for Highway 12 that includes design and construction techniques that avoid dredge-and-fill, use elevated sections to span the critical hotspots identified in the EIS, render beach nourishment and artificial dune building unnecessary, and allow natural island physical and biological processes to proceed unimpeded, then all interests could be satisfied. Such a solution would require a route, road/bridge design, and maintenance process that would permit breaches in Pea Island to open and fill naturally and overwash to proceed, thereby providing important bird nesting habitat. Furthermore, this design may involve some restoration of function in the ponds to increase the wetland acreage and also SAV habitat as mitigation for SAV losses involved in using the western alignment.

Our assembly and review of the technical literature provided some guidance on practices to avoid and processes to sustain during and after bridge and road construction on a coastal barrier island. In particular, there are ways to design and build bridges and roads to minimize construction, post-construction, and maintenance impacts attributed to shading, disruption of water circulation, dredging and filling, and wetland destruction. Nevertheless, no past study deals with a situation precisely analogous to the Bonner Bridge replacement issue, where access to, yet preservation of, such a valuable natural system as the Pea Island refuge is so critical. Hence, we conclude that more detailed, inspired, and motivated study of an alternative using the short bridge with a route and design for Highway 12 that maintain the environmental functions of Pea Island is advisable. Indeed, with regard to the issue of NC 12 maintenance we reiterate that the Supplemental Draft EIS notes that there is an approach in which “...components could be mixed and matched geographically along the length of NC 12 to create other variations.”

Response: *The commenter’s suggestions on how to improve the implementation of the Parallel Bridge Corridor with Road North/Bridge South are appreciated. It has been concluded, however, that because this alternative uses Refuge land outside the existing NC 12 easement, it cannot be implemented under the terms of Section 4(f) of the Department of Transportation Act of 1966, as amended, and the terms of the National Wildlife Refuge System Improvement Act of 1997. The Phased Approach/Rodanthe*

Bridge Alternative (Preferred), which was presented in the SSDEIS after these comments were made, would “use elevated sections to span the critical hotspots identified in the EIS, render beach nourishment and artificial dune building unnecessary, and allow natural island physical and biological processes to proceed unimpeded” as suggested by the commenter.

8.12.3.10 Sierra Club-December 9, 2005 (page B-265)

Comment: “Executed properly, the Pamlico Sound Bridge Corridor options provide the best balance of reliable, safe transportation, environmental protection, and recreational opportunities. It is our belief that not only can environmental protection and safe, reliable access be co-achieved, but that they are actually co-dependent; that is, given the dynamic nature of this area, the options that best protect the environment also ensure the most reliable transportation. It is our further belief that the Pamlico Sound Bridge Corridor options will be easier to move through the permitting process and, as such, will be better able to meet the urgent demands of the bridge replacement schedule.”

Response: *Comment acknowledged.*

Comment: “The Pamlico Sound Bridge Corridor options will unquestionably provide the most reliable transportation to and from Hatteras Island, as these options are the only ones that totally avoid all three existing overwash hotspots on NC 12 through Pea Island National Wildlife Refuge (PINWR). Accordingly, we believe that this would ultimately be the least expensive option when all costs of the bridge options, over the potential 100-year design life cycle, are fully and fairly considered. Each of the Parallel Bridge Corridor options would require some continued maintenance of NC 12 through PINWR, with the “With Nourishment” option requiring the most extensive amount of continual maintenance work, making it the least reliable and likely, the most costly, option.”

Response: *Comment acknowledged. The design life assumed in the SDEIS and SSDEIS was 50 years. However, some bridge structure components of the alternatives could potentially last longer than 50 years.*

Comment: “The Pamlico Sound Bridge Corridor is clearly the best option in terms of preserving the ecological and geologic integrity of the northern portion of Hatteras Island. The Sierra Club believes that the bridge replacement offers an excellent opportunity to protect and restore the natural characteristics of Oregon Inlet and the associated barrier island system, which will in turn benefit wildlife, recreational opportunity, and fisheries. As such, we believe that the following should be priorities in the bridge replacement project:

- removal of the terminal groin on the south side of Oregon Inlet;
- no nourishment/bulldozing within PINWR; and
- protection of dry and wet lands within PINWR.

The Pamlico Sound Bridge Corridor avoids submerged aquatic vegetation adjacent to Hatteras Island, and the lands of Pea Island National Wildlife Refuge (PINWR). The Pamlico Sound Bridge Corridor also precludes the need for the terminal groin to stabilize the north end of Hatteras Island as well as the need for nourishment and sand bulldozing within PINWR. In short, the Pamlico Sound Bridge Corridor keeps all options for the management of the northern portion

of Hatteras Island open, while the Parallel Bridge Corridor options will tie the hands of the state and federal government to intensive and increasingly difficult and expensive sand management activities within PINWR for the life of the new bridge.

We are sensitive to the need for a reliable navigational channel through Oregon Inlet between the Pamlico Sound and Atlantic Ocean and support the 2002 decision by the White House Council on Environmental Quality (CEQ) to provide state-of-the art navigational aids and to allow the US Army Corps of Engineers to use low-impact dredging to maintain an appropriate navigable channel for the vessels that currently use the inlet. The Sierra Club supports complete removal of the terminal groin and allowing semi-natural (because of the channel maintenance dredging) migration of the inlet. The Sierra Club believes that such an approach to the maintenance of Oregon Inlet for navigation will restore semi-natural barrier island processes south of the inlet, benefiting wildlife and enhancing fisheries in the area, while ensuring safe and reliable navigation for vessels using the inlet for recreation and commerce.”

Response: *Position acknowledged.*

Comment: “The Sierra Club recognizes that access to PINWR for recreational activities is a major concern of stakeholders involved in the bridge replacement planning process. Given our diverse membership, we share some of these concerns as well. While we support proposed efforts by the US Fish and Wildlife Service (USFWS) to reach consensus via future public planning sessions regarding access to PINWR and the disposition of NC 12 north of the Pamlico Sound Bridge terminus on Hatteras Island, we suggest that DOT, USFWS, and other critical parties begin this access planning process now in order to better address the public’s concerns about these matters.

With respect to access in a Pamlico Sound Bridge Corridor bridge replacement option, the Sierra Club generally supports a less intensive maintenance effort for the existing NC 12, and/or its corridor, north of the south terminus of the new bridge, following the bridge’s replacement. This should not include the maintenance of an artificial dune line to protect the highway. The Sierra Club supports continuing to allow access to PINWR and the inlet to the extent possible, consistent with the natural characteristics of PINWR, applicable law, and refuge policy. Such access will allow the public to explore, enjoy, and better appreciate the natural beauty and value of this rare and important barrier island ecosystem.

Likewise, we see no technical reason why fishing access to the inlet proper (such as is provided now via the catwalk on the south side of the Bonner Bridge) cannot continue to be provided in a Pamlico Sound Bridge Corridor replacement. While such a feature would certainly add to the cost of the replacement bridge, technical feasibility has been demonstrated, for example, by the public fishing pier on the Chesapeake Bay Bridge-Tunnel.”

Response: *Comment acknowledged. NCDOT recognizes the importance of providing access to Oregon Inlet for fishing and other recreational activities. It should be noted that access to the south side of Oregon Inlet is not provided in the current design of the Pamlico Sound Bridge Corridor.*

8.12.3.11 Southern Environmental Law Center-December 9, 2005 (page B-267)

Comment: “As scientists have developed a better understanding of barrier island dynamics, federal and state agencies are investigating long-term solutions to the problems posed by locating transportation corridors within this volatile system. The series of short-term solutions that have

been utilized to-date are costly and perpetual. Between 1987 and 1999, the Department of Transportation has spent as much as \$50 million to repair and protect the existing Bonner Bridge and NC 12 from the constant beach erosion and severe weather impacts.

The SDEIS lists a series of additional projects within the proposed project area that continue this short-term fix approach. These additional projects include: relocating NC 12 north of Rodanthe; planning for interim measures to protect NC 12 from sand and ocean overwash at the Sandbag Area Hot Spot; and planning for interim measures to protect NC 12 from sand and ocean overwash at the Canal Zone Hot Spot SDEIS at vi-vii. The need for these costly, temporary fixes will not end so long as NC 12 is located within this area. Furthermore, PINWR cannot be adequately managed in a manner that promotes the environmentally beneficial aspects of the barrier island system.”

Response: *The commenter’s opinion on the short-term project listed in Section 1.4.3 of the SDEIS and the FEIS is noted. It is important to observe, however, that these short-term projects (NCDOT TIP Project Nos. R-3116D, E/F) are companions to long-term studies for NC 12 maintenance on Hatteras Island and Ocracoke Island. The short-term and long-term studies listed reflect an effort by NCDOT and its environmental resource and regulatory agency partners to address NC 12 maintenance needs on a systematic rather than emergency basis. Short-term studies in the project area are currently on hold (and no longer listed in the TIP), and the Preferred Alternative would be implemented as a long-term solution to on-going NC 12 storm-related maintenance.*

Comment: “After several years of study, the federal and state agencies responsible for this proposed project reached concurrence that the Pamlico Sound bridge corridor would meet established long-term goals for the project area. Through the Outer Banks Task Force, state and federal agencies determined that the long-term goals for this area were (1) to preserve the natural barrier island system; (2) minimize impacts to Hatteras and Ocracoke islands; and (3) maintain access to and on the islands so that the transportation system is safe, efficient, and has minimal impact on the environment. SDEIS at 2-15. The Parallel Bridge corridor alternatives cannot meet these objectives because none preserve the natural barrier island system, all have significant effects on Hatteras Island, and the transportation corridor cannot be maintained safely and efficiently within this dynamic environment. As discussed in greater detail below, the Pamlico Sound Bridge is the only alternative that will work and can be authorized pursuant to applicable federal laws.

1. NCDOT and FHWA must demonstrate that bridge replacement is compatible with the purposes of Pea Island National Wildlife Refuge.
2. Only the Pamlico Sound Bridge alternative complies with the National Wildlife Refuge System Improvement Act.

As recognized in the SDEIS, the continued use of NC 12 thru PINWR is a use that is subject to a compatibility determination. As discussed above, NCDOT and FHWA must demonstrate that a bridge replacement alternative is compatible with PINWR’s purpose or it cannot be permitted. None of the Parallel Bridge alternatives comply with the National Wildlife Refuge Improvement Act because the associated operation and maintenance of NC 12 interferes impermissibly with the Refuge’s purpose. As explained in more detail below, the only alternative that can be determined to be compatible is the Pamlico Sound Bridge.

Response: *The preference of the commenter for the Pamlico Sound Bridge corridor and the reasons why are noted. The Pamlico Sound Bridge Corridor is not within the Refuge, so that the National Wildlife Refuge System Improvement Act of 1997 does not apply to the alternatives within this corridor. The Phased Approach/Rodanthe Bridge Alternative (Preferred) is confined within the existing NC 12 easement for which NCDOT has a permit. Therefore, a compatibility determination is not required.*

Comment: “As discussed above, PINWR supports a vast array of migratory birds, mammals, and threatened and endangered species. PINWR provides important feeding and nesting grounds for the federally listed piping plover and is a nesting area for loggerhead and green sea turtles.

Building any of the Parallel Bridge alternatives will directly, substantially, and adversely affect the continued utilization of the Refuge as a breeding ground for migratory birds and other wildlife and damage the ecological integrity of the refuge. In order to maintain NC 12 through the northern portion of Hatteras Island, which is a dynamic system with dramatic shoreline erosion and potential for new inlet formation, the needs of the wildlife refuge would be subsumed by the need to move the road, nourish the beaches, and develop an artificial dune system. Currently, the constant beach erosion and severe weather events result in continual maintenance to repair and protect the integrity of NC 12. SDEIS at 2-48. The repair and maintenance of NC 12 degrades the ecological integrity of the refuge and harms the habitat of migratory birds and wildlife.

Response: *The SDEIS, SSDEIS, and FEIS acknowledges that the Refuge supports a vast array of migratory birds, mammals, and threatened and endangered species and the Refuge’s concerns about the current level of maintenance on NC 12 and its impact on Refuge resources.*

Comment: “As the SDEIS acknowledges, “Oregon Inlet, Bodie Island, and Hatteras Island are part of a migrating barrier system characteristic of the southeast Atlantic Coast.” SDEIS at 3-31. High erosion rates characterize these systems. “The rate of erosion of the Hatteras Island shoreline has accelerated in the last decade (1993-2003). Shoreline erosion and ocean overwash threaten to sever segments of the NC 12 roadway for several miles south of Bonner Bridge.” SDEIS at 2-48. Even the inaccurate assessment provided in the SDEIS predicts that the shoreline will erode well into refuge land over the next 50 years. All Parallel Bridge corridor alternatives will require continual NC 12 maintenance, including moving the road, artificial dune creation, and beach nourishment. None of these repair and maintenance methods can occur within PINWR in a manner that is compatible with the Refuge purpose.

Beyond shoreline erosion, the proposed project area is susceptible to large storm events, which dramatically shape PINWR. “North Carolina coast is subject to two types of severe windstorms: extra-tropical northeasters and hurricanes. Northeasters, with accompanying high tides and waves, can rapidly erode the shoulders of Oregon Inlet. Northeasters are fairly common in this area, with between 30 and 35 hitting the coast each year. Hurricanes may be responsible for major events, such as inlet openings and closings and gorge shifts...” SDEIS at 3-36. As discussed in more detail below, the SDEIS underestimates the impact of these large storm events. For the purposes of the compatibility determination, these severe weather events perform important ecological functions and are beneficial to PINWR. Transportation corridors, however, require protection from severe weather events. In protecting NC 12, the natural processes are stunted and PINWR cannot fulfill its purpose.”

Response: *The detailed study alternatives assessed in the SDEIS, the SSDEIS, and the FEIS are west of the 2060 high erosion shoreline, placed on bridges, or involve a regular*

schedule of beach nourishment with the expectation that the regular NC 12 maintenance that currently occurs following storm events would no longer occur, or at least be substantially reduced, once the project is complete. The one exception is the effect of breaches that might occur on alternatives that do not bridge potential breach locations.

An island monitoring program (see Section 2.10.2.5) is proposed with the Phased Approach/Rodanthe Bridge Alternative (Preferred) that will enable future adaptations to the project schedule and construction as future shoreline change evolves.

Comment: “The Pamlico Sound bridge corridor allows PINWR to manage the refuge lands in such a way as to promote habitat creation and protection for the wildlife in the refuge. None of the Parallel Bridge alternatives allows sufficient flexibility for the Fish and Wildlife Service to manage PINWR and, therefore, cannot be compatible.

Within the Bonner Bridge project area, there are two areas that utilize public land. The northern termini of all bridge alternatives will utilize portions of the Cape Hatteras National Seashore. The southern termini of the proposed bridge options all utilize PINWR, but widely diverge on amount and impacts. Although PINWR is part of the Seashore, it is a separate section 4(f) resource and impacts to it must be evaluated separately. All of the Parallel Bridge alternatives adversely affect PINWR. The Pamlico Sound Bridge is the only alternative that completely avoids any impacts and does not utilize public land within PINWR.

The Pamlico Sound Bridge is a feasible and prudent alternative that prohibits the approval of any other alternative.

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred), which was assessed in the SSDEIS after this comment was made, is within the existing NC 12 easement and does not constructively use the Refuge. Therefore, Section 4(f) does not apply to this alternative, except on Bodie Island where it would use land from the Seashore. The Pamlico Sound Bridge Corridor is not practicable based on cost estimates and funding availability. See Section 2.15 for the reasons for selection of the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative.*

Comment: The Pamlico Sound Bridge is a prudent and feasible alternative to using PINWR land. It is within the range of accepted engineering to build the Pamlico Sound Bridge and it is a feasible alternative. The Pamlico Sound Bridge does not present any unique problems or unusual factors. Any replacement bridge alternative must meet the SDEIS listed purposes, which are: (1) daily and emergency access across Oregon Inlet; (2) allowing continued navigation of Oregon Inlet while allowing the channel to move and (3) ensuring that any replacement is not threatened by the dynamic shoreline movement as predicted through 2050. SDEIS at 1-5 through 1-6. The Pamlico Sound Bridge achieves the listed purposes. It provides a safe, reliable, transportation corridor that bypasses the dynamic areas of Hatteras Island and avoids impacts to PINWR.

The economic, social, and environmental impacts related to the Pamlico Sound Bridge alternative are not extraordinary. Instead, the Pamlico Sound Bridge is more effective economically, socially, and environmentally. The Pamlico Sound Bridge provides a more dependable daily and emergency transportation route. The Pamlico Sound Bridge is more cost-effective. ‘In fact, once a property has been designated as a § 4(f) property, the monetary expense required to protect that property in conjunction with a roadway construction project is of minimal relevance.’ Hatmaker v. Georgia DOT by & Through Shackelford, 973 F. Supp. 1058, 1062 (M.D. Ga. 1997). The Pamlico Sound Bridge corridor eliminates the need for costly beach nourishment, dune building,

and road maintenance that would occur in perpetuity with any other bridge replacement alternative. Although the SDEIS artificially restricts the project life to 50 years, the actual expected bridge life expectancy is 100 years. SDEIS at 3-39, 3-43. All of the Parallel Bridge alternatives, if built, would require significant annual expenditure well beyond the lifetime of any person currently involved in this project. At the end of the 100 year life-span, the dynamic nature of the barrier island system will not have changed and the state of North Carolina will have thrown away billions of dollars. The Pamlico Sound Bridge eliminates the perpetual and costly maintenance expenses and is a more economically sound bridge alternative. Furthermore, the Pamlico Sound Bridge is more environmentally responsible. By avoiding PINWR, the Pamlico Sound Bridge allows the refuge to be managed to support wildlife conservation and it avoids the adverse environmental impacts associated with beach nourishment, dune building, and other transportation corridor maintenance.

For all these reasons, the Pamlico Sound Bridge alternative is a feasible and prudent alternative and the Secretary is prohibited by Section 4(f) from funding or permitting any of the Parallel Bridge alternatives.

Response: *The Pamlico Sound Bridge Corridor alternatives as noted by the commenter also do not use land from the Refuge. The Pamlico Sound Bridge Corridors, however, were found not to be economically viable. See Section 2.15 for the reasons for selection of the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative.*

Comment: The Parallel Bridge alternatives cannot be considered because they do not minimize harm to the refuge, as required by Section 4(f).

Section 4(f) requires any alternative that utilizes public land to “include all possible planning to minimize harm to the...wildlife and waterfowl refuge.” 49 U.S.C. & 303 (c) (2). The Parallel Bridge alternatives do not minimize harm to the refuge, but rather are the most harmful alternatives.

The draft 4(f) determination provided in the SDEIS is inadequate because it ignores the required feasible prudent analysis and inadequately addresses the requirement that harm to the refuge is minimized.

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred), which was assessed in the SSDEIS after this comment was made, is within the existing NC 12 easement and does not cause a constructive use of the Refuge and, as such, Section 4(f) does not apply to this alternative in association with the use of Refuge lands. See the least harm analysis in Section 5.4.*

Comment: Although the draft section 4(f) evaluation acknowledges the legal standards for a 4(f) determination, the draft 4(f) analysis omits any reference to whether the alternatives presented are feasible and prudent. SDEIS at 5-1. As discussed above, section 4(f) is an “explicit bar” to any federal approval for utilization of refuge lands. The draft section 4(f) evaluation must first look at any alternatives to using refuge lands. Then, if no feasible and prudent alternatives are found, any alternative that uses refuge land must minimize harm to the refuge. As discussed above, the Pamlico Sound Bridge alternative is feasible and prudent. Therefore, no utilization of refuge land may be permitted and the section 4(f) evaluation is complete. The current draft section 4(f) evaluation, however, recognizes that the Pamlico Sound Bridge alternative “is an avoidance alternative” because it does not use refuge lands, but the evaluation fails to determine that it is a feasible and prudent alternative. SDEIS at 5-41.

Response: *The determination that there is no prudent or feasible alternative is only included in the Final Section 4(f) Evaluation after public review of the Draft Section 4(f) Evaluation. The Phased Approach/Rodanthe Bridge Alternative (Preferred) that was added in the SSDEIS is a Refuge avoidance alternative. See the least harm analysis in Section 5.4.*

Comment: Furthermore, the draft section 4(f) arbitrarily states that both the Parallel Bridge and the Pamlico Sound alternatives minimize harm to PINWR equally. SDEIS 5-41. Section 4(f) requires that in the event there is no prudent and feasible alternative that impacts to a wildlife refuge be minimized. The purpose of Wildlife Refuges (as discussed above in the Compatibility Section) is the conservation of wildlife. The impacts on PINWR associated with the Pamlico Sound Bridge alternative are limited to impacts on -the existing visitor's center. The issues related to access by PINWR visitors should not be described as harm to the Refuge. The primary purpose of the refuge is wildlife conservation and the Parallel Bridge alternatives are the only alternatives that impact the wildlife conservation mission of PINWR. Moreover, the existing visitor center could be easily relocated. All other ancillary impacts cannot be characterized as harm to the Refuge because they do not harm the purpose of the Refuge.”

Response: *The statement of reference that appears on page 5-41 of the SDEIS acknowledges differing positions on the importance of road access expressed by the full range of stakeholders in the project area, including the public and local government officials. See Section 5.4.1.2.*

Comment: “The SDEIS inadequately analyzes the environmental impacts related to shoreline erosion and new inlet formation; endangered and threatened species; and impacts to wetlands.

The proposed project is located in an extremely dynamic coastal area, which includes an active tidal inlet (Oregon Inlet) and a coast subject to significant shoreline erosion and ocean overwash. Within the project area, NC 12 is subject to perpetual threats from the shoreline erosion and ocean overwash and because of the dynamic nature of the system is subject to regular maintenance. The SDEIS does not adequately analyze the effects of shoreline erosion, inlet creation, and ocean overwash on the proposed project area. Rather, the SDEIS de-emphasizes the damage that these processes can inflict on NC 12 and neglects the beneficial impacts to the environment.

The SDEIS correctly states that the proposed project area is subject to a high rate of erosion. SDEIS at 3-31. It appears, however, that in calculating the average annual shoreline erosion rate that the SDEIS fails to incorporate several important factors.

First, the SDEIS states that shoreline erosion rates have been increasing. SDEIS at 2-48. By utilizing historic annual average erosion rates, however, the erosion rates may underestimate the amount of erosion that will occur and the projected shoreline movement through 2060 may be substantially conservative. Second, nourishment increases the erosion rate over that expected for a natural beach. See, Pilkey, et al, North Carolina Shore and Its Barrier Islands 100 (1998). Although sub-areas within the project area have been nourished in the past, the shoreline prediction rates do not appear to include a factor related to increased erosion from beach nourishment. Third, sea level rise is also predicted to increase erosion rates. *Id.* at 45. Finally, by utilizing an average erosion rate as LS prediction tool for the shoreline, the SDEIS fails to adequately analyze the importance of large or severe storm events in shaping the proposed project area. Although the effect of Hurricane Katrina on Gulf of Mexico barrier islands is still being evaluated there is no doubt that major weather events shape the barrier islands. This year was the

most active hurricane season on record and 2006 is predicted to be of similar magnitude. Historically, major storm events have dramatic effect on the project area- creating inlets, increasing erosion. By failing to account for the impact from severe weather events, the SDEIS arbitrarily discounts the impacts of severe weather. SDEIS at 3-36. Federal regulations require, however, that environmental impact statements analyze reasonably foreseeable catastrophic events, “even if their probability of occurrence is low.” 40 C.F.R. § 1502.22 (2005).

Response: *The average erosion rates include in their calculation, both periods of rapid erosion during storm events and periods of slower erosion when severe storms do not occur. They also include “prediction intervals,” a statistical technique to account for uncertainty (see Section 3.6.2.1 of the SDEIS and Section 3.6.3.1 the FEIS). For the Phased Approach/Rodanthe Bridge Alternative (Preferred) a monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS. This program also takes into account uncertainty and the potential for severe storm events to alter the timing of phase implementation assumed in the SSDEIS and the FEIS.*

In addition, between the SSDEIS and FEIS, FHWA sponsored a Peer Exchange workshop on global climate change (see Section 4.6.6). Panelists at the Peer Exchange workshop generally agreed that the analysis’s high erosion rate results of future shoreline position may account for a portion of sea level rise caused by future changes in climate. In addition to the future shoreline analysis, past sea level rise in one location as well as a range of potential future sea level rise scenarios for the mid-Atlantic coast were also considered at the workshop. There was consensus that the current global sea level rise analytical models are not fully developed to predict local effects. The wide range of future sea level rise information considered illustrates the uncertainty associated with estimating future sea levels and shoreline locations. Panelists generally agreed that the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative (Preferred) with the island monitoring program as outlined in Section 2.10.2.5 is the most practical method for carrying out the project with the given constraints, in part because it gives an opportunity to review and incorporate new analysis prior to commencement of each phase.

Comment: Inlets are very high energy and difficult to predict. As the SDEIS accurately summarizes, experts have identified five potential inlet locations along Pea Island. The SDEIS ignores, however, the beneficial impacts to the environment of natural inlet creation, migration, and closure. For example, during severe weather events, inlets act as release valves, allowing storm surge that has entered the sound to exit. Inlets also help to protect shallow sand shoals. The Pamlico Sound Bridge corridor confers an environmental benefit on the proposed project area that should be considered in evaluating the alternatives.

Response: *The phasing scheme for the Phased Approach/Rodanthe Bridge Alternative (Preferred) assumes that four of the five potential breach locations are bridged during Phase II, including the area at Rodanthe where a breach is most likely to occur. It is NCDOT’s intent to place a high priority on the implementation of Phase II as soon as it is practicable. The fifth location (former New Inlet area) would be bridged during Phase III. See the new discussion of the positive benefits of allowing natural barrier island change in Section 4.7.7.*

Comment: “Ocean overwash is a natural and essential part of barrier island dynamics. Overwash moves sand to the sound side of barrier islands. Over long time scales, these processes

enable barrier islands to respond to sea level rise by moving the island landward. On shorter, multi-year time scales, overwash processes deposit sand and cause landform changes, both of which are needed to maintain a healthy ecosystem for coastal plant and animal species. Because ocean overwash is detrimental to the transportation corridor, engineering practices such as artificial dune building and beach nourishment are used to prevent ocean overwash. This deprives barrier islands of the necessary resilience to respond to sea level rise and prevents habitat creation. The SDEIS does not analyze the environmental benefits from removing the transportation corridor and allowing ocean overwash.”

Response: *A discussion of the positive geomorphological and natural resource benefits of allowing the natural movement of the shoreline to take place is added to Section 4.7.7 of the FEIS.*

Comment: “The SDEIS fails to investigate adequately negative biological impacts to beach organisms. Organisms can be harmed either directly by said placement or indirectly through alterations to the beach environment. Indirect impacts from beach nourishment can include diminished reproductive success, reduction in biomass of prey items, and long-term changes to substrate composition at dredging sites. For example, “birds may be displaced by dredges, pipelines, and other equipment along the beach, or may avoid foraging on the beach if they are aurally affected.” Atlantic States Marine Fisheries Commission, “Beach Nourishment: A Review of the Biological and Physical Impacts” (November 2002). Other direct impacts include eggs, hatchlings, and adult birds crushed by sand. Indirect impacts to birds feeding are related to the sediment grain. “If the sediment is too coarse or high in shell content it can inhibit the bird’s ability to extract food particles in the sand. Fine sediment that reduces water clarity can also decrease feeding efficiency of ‘birds.’”

Response: *Impacts of nourishment on fisheries and wildlife are noted throughout Section 4.7.6 of the SDEIS and FEIS. Beach organisms are discussed in Section 4.7.6.4. Birds are discussed in Section 4.7.6.7. An alternative involving nourishment was not selected as the Preferred Alternative.*

Comment: “Nourishment can change the geological profile of the target beach. As mentioned above,” a steeper beach profile is created when sand is stacked on the beach during the nourishment process. This condition can lead to great wave energy and the beach and greater beachside erosion.” Atlantic States Marine Fisheries Commission, “Beach Nourishment: A Review of the Biological and Physical Impacts” (November 2002). Because of this higher erosion rate, the demand for sand increases over the life of the beach. As discussed above, nourishment precludes ocean overwash, leading to further erosion on the sound side.”

Response: *The calculations for beach nourishment include a factor that is multiplied by the known (pre-project) erosion rate at the site. This was done to compensate for losses described in the comment. The factor also accounted for end losses, which are not mentioned in the comment.*

Comment: “The SDEIS artificially limits the true cost of the Parallel Bridge/nourishment alternative because it is a cost-estimate based on a 50 year project period. The life expectancy of any of the bridge alternatives is anticipated to be 100 years. SDEIS at 3- 39, If the accurate project life-span is used in nourishment cost calculations, the total cost for nourishment is estimated to be \$930,000,000. See Pea Island Shoreline 100-year Assessment, FDH Engineering, Inc. (July 2004). For the long-term, the Parallel Bridge/nourishment alternative far exceeds the cost of the Pamlico Sound Bridge Corridor.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years. However, some bridge structure components of the alternatives could potentially last longer than 50 years.*

Comment: “The SDEIS states that a parallel bridge corridor is likely to adversely affect the threatened green sea turtle and piping plover. SDEIS at 4-71, 4-73. The Pamlico Sound Bridge alternative is not likely to adversely affect any federally protected species. SDEIS at 4-69 - through 4-77. The SDEIS inaccurately concludes that a parallel bridge corridor is not likely to adversely affect the threatened loggerhead sea turtle. SDEIS 4-73. Loggerhead sea turtles are known to breed on the beaches within the project area and, as with green sea turtles, would likely to be adversely affected by a parallel bridge alternative.

The SDEIS fails to consider the impacts of required long-term nourishment on piping plover or sea turtles. To the extent nourishment is an integral part of a parallel bridge alternative, it must be considered in assessing adverse impacts to threatened or endangered species. Long-term nourishment of 6.3 miles of beaches on a four-year return interval within the project area would have adverse impacts on piping plover and sea turtles. Long-term nourishment has several adverse effects. By utilizing nourishment and large artificial dunes to protect NC 12, the nourishment will prevent overwash. Overwash is part of ecologically important inlet creation, migration and closure and over time, helps to create new moist sand intertidal feeding areas on the sound side. Without overwash, erosion continues to threaten sound side wetlands. By suppressing overwash, nourishment leads to loss of piping plover sound side feeding habitat and nesting habitat. In addition, the nourishment and artificial dune system prevents natural maintenance of existing habitat by increasing vegetative succession. Furthermore, nourishment may result in steeper beach profile, reducing the available intertidal area. National Park Service, Natural Resource Year in Review-2004: Ecosystem Restoration in an Altered Coastal Environment, available at www2.nature.nps.gov/YearinReview/01_A.html (last visited Dec. 8, 2005) (“A berm constructed to reduce the potential for island breaching has prevented natural overwash processes and has reduced habitat availability of piping plover.”)

The SDEIS fails to analyze the impacts of nourishment on sea turtles. Beach nourishment can directly impact turtles by burying nests and disturbing nesting turtles. Because nourishment can change the beach, it impacts turtles indirectly. Beach nourishment may result in increased sand compaction and hardness and changes in moisture content and beach slope. Furthermore, as discussed above, nourished barrier islands may erode more quickly than natural beaches. This rapid erosion creates escarpments, which hampers access to nesting sites. In a vicious cycle, the rapid erosion may necessitate re-nourishment: at more frequent intervals, thereby increasing the likelihood of interference with sea turtle nesting.”

Response: *An alternative involving nourishment was not selected as the Preferred Alternative. The biological conclusions in Section 4.7.7 of the SDEIS and the SSDEIS for the Parallel Bridge Corridor Alternative are applicable to the alternatives involving nourishment and specific observations related to the nourishment alternative were added to Section 4.7.7 in the SSDEIS. For the Phased Approach/Rodanthe Bridge Alternative (Preferred), FHWA and NCDOT have completed formal consultation with the US Fish and Wildlife Service under the requirements of Section 7 of the Endangered Species Act of 1973, as amended. Its findings, including those for the piping plover and several sea turtles, also are presented in Section 4.7.9 of the FEIS.*

Comment: “The various bridge alternatives assessed in the SDEIS all impact wetlands and will require authorization under Section 404 of the Clean Water Act. SDEIS at 2-116. The Pamlico Sound alternative has substantially less impact on wetlands and the aquatic environment than all of the other alternatives considered: 4.18 to 4.84 acres of wetlands (depending on the terminus) including only .01 acres of CAMA wetlands. Of the alternatives assessed, the Parallel Bridge/road north/bridge south alternative impacts by far the largest amount of wetlands: 78.2 acres of wetlands including 11.8 acres of CAMA wetlands. SDEIS at 4-58, the Parallel Bridge/all bridge alternative impacts the second largest amount of wetlands: 12.3 acres of wetlands including 2.2 acres of CAMA wetlands.

The Parallel Bridge/nourishment alternative would impact an extensive but unquantified amount of wetlands and waters. While the SDEIS slates that this alternative would impact 4.3 acres of wetlands including .3 acres of CAMA wetlands, this estimate does not include extensive filling of near-shore waters associated with the required nourishment. *Id.* The SDEIS states that 6.3 miles of beach will be nourished every four years. SDEIS at 2-104. The SDEIS further notes that in addition to direct fill impacts, the Parallel Bridge/nourishment alternative would result in “additional impacts associated with dredging for sand and then nourishment of 6.3 miles (10.1 kilometers) of the seashore within the refuge.” SDEIS at 4-66. These impacts must be assessed and considered in the 404 permit review as a part of the Parallel Bridge/nourishment alternative per 33 C.F.R. § 325.1 (d)(2): ...

The Pamlico Sound Bridge is a practicable alternative with the least impact on aquatic ecosystems and wetlands, and is the only alternative assessed in the SDEIS that may be permitted under Section 404.”

Response: *Support for the Pamlico Sound Bridge is acknowledged. The NEPA/Section 404 merger process concluded that the Phased Approach/Rodanthe Bridge Alternative (Preferred), which was assessed in the SSDEIS that was prepared after these comments were submitted, is the LEDPA.*

Comment: “The SDEIS identifies continued access to PINWR as an area of concern. We support continued public access to PINWR. We do not agree, however, the access is contingent upon maintenance of NC 12. Many public lands provide for public access to remote areas. For example, Chincoteague National Wildlife Refuge in Virginia has a transportation plan that provides for access to the barrier island, Back Bay National Wildlife Refuge in Virginia and Santa Anna National Wildlife Refuge in Texas both offer tram services, and Cape Lookout National Seashore provides a boat ferry to dock and transportation to the point.

PINWR Refuge Manager has publicly stated that “U.S. Fish and Wildlife Service will continue to allow people to enjoy compatible, wildlife-dependent recreational uses on Pea Island National Wildlife Refuge.” Letter from Mike Bryant, Pea Island National Wildlife Refuge Manager, to Citizens of Outer Banks, (June 26, 2003) (available at <http://www.fws.gov/peaisland/images/bonnerbridgeletter62603.pdf>). We believe that access to the Refuge can be accommodated within a reasonable refuge management plan and the Fish and Wildlife Service has shown itself capable of managing a reasonable access plan for other National Wildlife Refuges.

We recognize the need to replace Bonner Bridge and support construction of a new bridge that provides dependable transportation to Hatteras Island, is environmentally sound, and is economically reasonable. We support the Pamlico Sound Bridge corridor alternative and believe that it satisfies these objectives.”

Response: *Support for the Pamlico Sound Bridge and the acceptability of alternate Refuge access is acknowledged.*

8.12.3.12 Southern Environmental Law Center-April 17, 2007 (page B-276)

Comment: “After reviewing the Supplement, the SDEIS, and associated scientific research, we continue to support the Pamlico Sound Bridge alternative and do not agree that any of the alternatives that utilize the Parallel Bridge corridor, including the new Phased Approach, are viable alternatives.

Response: *The commenter’s preference is noted.*

Comment: The Supplement proposes an additional alternative-the Phased Approach- within the Parallel Bridge corridor explained in the SDEIS. This new alternative continues to maintain a transportation corridor at the cost of public safety, reliability, and ecological protection. Furthermore, the Phased Approach is not compatible with the purpose of the Pea Island National Wildlife Refuge, pursuant to the National Wildlife Refuge System Improvement Act, nor is it a viable alternative pursuant to Section 4(f) of the Department of Transportation Act of 1966.

Response: *Section 4(f) lands are not used except in the Seashore on Bodie Island. On Hatteras Island, the Phased Approach/Rodanthe Bridge Alternative (Preferred) remains within the existing NC 12 easement, so it does not use land from the Refuge, nor is there a constructive use of the Refuge; therefore, Section 4(f) does not apply. The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed under the terms of its easement permit with the USFWS and a compatibility determination under the National Wildlife Refuge System Improvement Act of 1997 is not required.*

Comment: Pea Island National Wildlife Refuge (“Refuge”) is at the core of the debate about the Bonner Bridge replacement. Hatteras Island and Oregon Inlet are part of a dynamic barrier island system and the Refuge relies on this dynamic process for ecological viability. The Refuge is subject to ocean overwash, high shoreline erosion rates, inlet formation, and other impacts associated with large storm events, sea level rise, and general barrier island dynamics. While many of these natural processes are incompatible with transportation corridors, they are beneficial to the abundant wildlife and are instrumental in creating nesting habitat, feeding grounds, and other natural habitats. These tremendous natural resources draw tourists, anglers, birders, and other outdoor enthusiasts. Many members of our organizations regularly recreate and enjoy the natural resources of the Refuge. We support protecting the biological integrity of the Refuge and ensuring continued access for all compatible wildlife-dependent recreational uses of the Refuge that are consistent with the U.S. Fish and Wildlife Service’s congressionally mandated mission to “provide for the conservation of fish, wildlife, and plants, and their habitats.”

NC 12 and its associated maintenance are steadily degrading the Refuge and the Phased Approach does not protect against this degradation. As discussed more fully below, the Phased Approach is not a viable alternative. The Phased Approach would keep NC 12 under construction for the life of the project as short bridges are perpetually built through the Refuge north of Rodanthe. Furthermore, the “phased” short bridge locations are estimated based on current shoreline erosion and inlet formation predictions. Shoreline changes, however, are often episodic in nature and are difficult to predict precisely. An inlet could form or the shoreline erode prior to or during a planned construction phase. Also, the effect of climate change has not been adequately evaluated. Any increase in storm intensity and/or sea level rise may cause substantial

revisions to the current predictions, further exacerbating the uncertainty associated with predicting inlet/breach locations and timing.”

Response: *As indicated in Section 2.2.2.4 of the SSDEIS and Section 2.10.2.5 of the FEIS, Phase I is expected to be built in 3.5 years and the other three phases over a period of 3 years each. Thus, while a more extensive construction period than if the project were not phased, construction would not occur over the entire 50-year life of the project. An island monitoring program and process for deciding when to implement each phase as the shoreline evolves is presented in Section 2.10.2.5 of the FEIS. A description of how accelerated sea level rise was considered in the shoreline erosion estimates is presented in Section 3.6.3.3 of the FEIS. Discussions of the impact of accelerated sea level rise are included in Section 4.6.6. Also included in Section 4.6.6 is a description of a Peer Exchange workshop on global climate change sponsored by FHWA for the Bonner Bridge project.*

Comment: “Even if the Phased Approach could be completed in a manner compatible with the dynamic shoreline, the final project is a long bridge in the Atlantic Ocean. As the Supplement acknowledges, the Phased Approach would interfere with fishing, surfing, and other beach activities and will severely limit and reduce access to the Refuge. In contrast, the Pamlico Sound Bridge is safer, more reliable, and more protective of the environment. The Pamlico Sound Bridge would not be subject to ocean overwash, inlet formation, or erosion. It would allow the U.S. Fish and Wildlife Service to preserve and protect the Refuge and the associated wildlife. Furthermore, the Pamlico Sound Bridge is the only alternative that will work and can be authorized pursuant to applicable federal laws.”

Response: *The commenter’s preference for the Pamlico Sound Bridge is noted. NCDOT and FHWA believe that the Phased Approach/Rodanthe Bridge Alternative (Preferred) can be authorized pursuant to applicable federal laws.*

Comment: “In our comment letter on the SDEIS dated December 9, 2005, we reviewed in detail the legislative history and current cases interpreting the National Wildlife Refuge System Improvement Act (Refuge Act). The Refuge Act continues to be pertinent to the discussion of additional alternatives, but for the sake of brevity that discussion is hereby incorporated by reference.

The Phased Approach and any indirect or cumulative impacts associated with it are subject to a compatibility determination pursuant to the Refuge Act. The Refuge Act prevents any new use or expanded, renewed, or extended use of a refuge to be permitted, “unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety.” 16 U.S.C. 668dd(d)(3)(A)(i). To be compatible, uses must preserve a refuge and promote the refuge system’s mission. Accordingly, any use of the Refuge must be one that does not degrade the Refuge’s ecological integrity nor interfere with its mission to provide a refuge and breeding ground for migratory birds and other wildlife.

All indirect and cumulative impacts that arise from a refuge use must also be considered and determined to be “compatible.” The Refuge Compatibility Policy clearly states: “The Refuge Manager must consider not only the direct impacts of a use but also the indirect impacts associated with the use and the cumulative impacts of the use when conducted in conjunction with other existing or planned uses of the refuge, and uses of adjacent lands or waters that may exacerbate the effects of a refuge use.” 65 Fed. Reg. 62484, 62490 (Oct. 18, 2000). Because the Phased Approach, and the associated direct and indirect impacts, is a use of the Refuge that

“materially interfere[s] with” and “detract[s] from the fulfillment of the mission of the System or the purposes of the refuge,” it cannot be found to be compatible. 16 U.S.C. 668ee.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed under the terms of its easement permit with the USFWS and a compatibility determination under the National Wildlife Refuge System Improvement Act of 1997 is not required.*

Comment: “The Phased Approach directly impacts the Refuge. The Phased Approach will maintain a transportation corridor that bisects the Refuge for fifty years (the life of the project). During the life of the project the perpetual construction and associated noise and direct environmental impacts will degrade the Refuge resources, degrade wildlife habitat, and materially interfere with the purpose of the Refuge. The Phased Approach also will have significant indirect impacts. Because of the unpredictable nature of barrier island dynamics-including inlet/breach formation, shoreline erosion rates and locations, and sound side erosion-the Phased Approach will likely require “temporary” or “emergency” actions that will permanently and adversely affect the Refuge. As has been the case for maintaining NC 12 in the past, these temporary measures include sand bags, beach nourishment, dune rebuilding, dune sprigging and fencing. All of these measures interfere with the natural barrier island dynamics that are necessary to sustain naturally the Refuge and the associated wildlife. These measures have severe affects on wildlife and habitat and are reasonably foreseeable indirect impacts associated with the Phased Approach. Furthermore, the final Phased Approach is a bridge in the Atlantic Ocean. This ocean-side bridge will be a new feature on the beach, which the Supplement fails to evaluate adequately. For example, an ocean-side bridge may affect erosion rates, inlet formation, ocean overwash, etc. Once these natural processes are interrupted, the bridge will impact migratory bird and other wildlife habitat. Although the Supplement refers to studies conducted on a pier, it is illogical to assume that a pier would have the same effects on the adjacent shoreline as a bridge that travels parallel to the shore for miles. For these reasons, the Phased Approach is not compatible with the Refuge.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) will place NC 12 on a bridge in locations forecast to be threatened by erosion prior to 2060. It will bridge potential island breach locations. Once complete, the temporary or emergency actions described by the commenter will not occur. An assessment of the expected NC 12 maintenance activities that would occur prior to the implementation of each phase is added to Section 2.10.2.5 of the FEIS. This assessment assumes a monitoring program and process for deciding when to implement each phase as the shoreline evolves also presented in Section 2.10.2.5 of the FEIS. Additional analyses of the effect of the Phased Approach/Rodanthe Bridge Alternative (Preferred) on coastal processes is included in Section 4.6 of the FEIS. Additional assessment of the natural resource impact of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is included in Section 4.7 of the FEIS.*

Comment: “The Supplement incorrectly states that a compatibility determination is only necessary for “alternatives that use Refuge lands outside the existing easement.” Supplement at xxiv. First, as discussed above, the Refuge Act specifically mandates that a compatibility determination consider the direct, indirect, and cumulative impacts on refuge land and any adjacent land or waters that affect the Refuge use. The Phased Approach will have direct and indirect adverse impacts on the Refuge and it is therefore subject to a compatibility determination. Furthermore, the NC12 easement is not a carte blanche proclamation that allows NCDOT to pursue any action without respect for the Refuge Act. The Refuge Act itself recognizes that easements and right-of-ways may coexist on national wildlife refuges. Work

within easements, however, may be limited by the Refuge Manager and may be subject to a compatibility determination. For example, maintenance of an existing right-of-way is subject to review and approval by the U.S. Fish and Wildlife Service and is restricted to minor actions such as minor expansions or minor realignments to meet safety standards. See Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 62484, 62490 (Oct. 18, 2000). The Phased Approach’s impacts on the Refuge are far from minor, include significant direct and indirect effects, and cannot be determined to be compatible.”

“Finally, the Supplement and the SDEIS are inadequate because the information is not sufficient to prove that any of the Parallel Bridge alternatives, including the Phased Approach, could be compatible. North Carolina Department of Transportation and Federal Highway Administration have the burden to prove that a use is compatible. “Compatibility, therefore, is a threshold issue, and the proponent(s) of any use or combination of uses must demonstrate to the satisfaction of the Refuge Manager that the proposed use(s) pass this threshold test. The burden of proof is on the proponent to show that they pass; not on the Refuge Manager to show that they surpass.” 65 Fed. Reg. 62484,62490 (Oct. 18,2000) Nothing in the Supplement or the SDEIS proves that any Parallel Bridge alternative, including the Phased Approach, could possibly be found to be compatible and the NCDOT and FHWA have not met the burden of proof.”

Response: *The Phased Approach/Rodanthe Bridge Alternative (Preferred) is allowed under the terms of its easement permit with the USFWS and a compatibility determination under the National Wildlife Refuge System Improvement Act of 1997 is not required.*

Comment: “Pursuant to Section 4(f), the Refuge may not be used for a transportation corridor absent a finding by the Secretary of Transportation that no alternative exists to utilizing the Refuge land.

We remain concerned that the draft Section 4(f) determination provided in the Supplement is inadequate because it fails to acknowledge that the Pamlico Sound Bridge is the only alternative that exists to utilizing the Refuge and inadequately evaluates how the other alternatives minimize harm to the Refuge. Although the draft Section 4(f) evaluation acknowledges the legal standards for a Section 4(f) determination, the draft Section 4(f) analysis omits any application of those standards. Section 4(f) is an “explicit bar” to any federal approval for utilization of refuge lands. The draft Section 4(f) valuation must first look at any alternatives to using refuge lands. Then, if no feasible and prudent alternatives are found, any alternative that uses refuge land must minimize harm to the refuge.

The Pamlico Sound Bridge alternatives are the only alternatives to using Refuge lands and the Supplement and SDEIS recognize it as the “avoidance” alternative for Section 4(f) purposes. None of the other alternatives, including the Phased Approach, can be considered to avoid the impacts on the Refuge. Because the Pamlico Sound Bridge satisfies the first prong of the Section 4(f) evaluation, Section 4(f) explicitly bars any other alternative.”

Response: *Both the Pamlico Sound Bridge Corridor and the Phased Approach alternatives (including the Preferred Alternative) are Section 4(f) avoidance alternatives from the perspective of the Refuge. See the Final Section 4(f) Evaluation (Chapter 5) for more information. Section 5.3 discusses the avoidance alternatives and concludes that there are no alternatives that do not use Section 4(f) property. Section 5.4 documents that the Preferred Alternative is of the least overall harm in light of the statute’s preservation purpose and includes all possible planning to minimize harm.*

Comment: “The Phased Approach will have significant adverse impacts on the Refuge that the Supplement fails to adequately evaluate. As discussed in our comments on the SDEIS, hereby incorporated by reference, all Parallel Bridge alternatives, including the Phased Approach, will be impacted by shoreline erosion, inlet formation, and ocean overwash. The shoreline erosion and inlet formation evaluation is particularly pertinent in evaluating the Phased Approach. Because these events are episodic by nature, it is impossible to predict precisely when and where an inlet might form or erosion imminently threaten NC 12. Although it is impossible to predict dates and times, past experience and current modeling predict that NC 12 is subject to perpetual threats. The Supplement and the SDEIS fail to take a “hard look” at the adverse impacts from placing a transportation corridor within such a dynamic system. The Phased Approach does not avoid these impacts. The schedule for the “phased” bridges may or may not coincide with the natural movement of Hatteras Island or with predicted inlet formations. A bridge might be under construction when an inlet forms underneath it or an inlet may form prior to construction even beginning. The SDEIS and the Supplement fail to analyze the reasonably foreseeable impacts to the Refuge from temporary or “emergency” measures taken to protect a phased bridge under construction or an area that is not slated for construction until decades after the threat. These temporary or emergency measures including, for example, sand bags, road relocation, beach nourishment, dune building (and rebuilding), all have permanent and adverse ecological impacts that severely affect biota, geology, and overall ecology of the Refuge. Finally, the final outcome of the Phased Approach is a bridge in the Atlantic Ocean. The placement of a bridge of this length and size on a dynamic shoreline raises many concerns. How will the bridge withstand the natural forces, including increased impacts from wind, in a manner that provides a safe and reliable transportation corridor? How will the presence of a bridge parallel to the shore impact long shore sediment transport, erosion rates, and inlet formation? The Supplement relies on a single study of a pier and analogizes to the ocean-side bridge that is parallel to the shore. This analysis lacks substance and is inadequate. Without thoroughly and completely evaluating the impacts on the environment from these measures, the Supplement and the SDEIS fail to take a “hard look” at the reasonably foreseeable effects from the Parallel Bridge alternatives.”

Response: *An assessment of the expected NC 12 maintenance activities that would occur prior to the implementation of each phase of the Phased Approach/Rodanthe Bridge Alternative (Preferred) is added to Section 2.10.2.5 of the FEIS. This assessment assumes a monitoring program and process for deciding when to implement each phase as the shoreline evolves also presented in Section 2.10.2.5 of the FEIS. Additional analyses of the effect of the Phased Approach/Rodanthe Bridge Alternative (Preferred) on coastal processes is included in Section 4.6 of the FEIS.*

Comment: “The Supplement also proposes a “mix and match approach that cannot be supported by the NEPA analysis. The “mix and match” approach assumes that any and every combination of impacts has been adequately analyzed. Unfortunately, this approach fails to recognize that each alternative-bridges, nourishment, and dune building-will have different environmental impacts (direct, indirect, and cumulative) depending on the magnitude of the alternative (e.g. the total miles and location of nourishment), the sequence of chosen alternatives, the timing relative to shoreline changing events, and the scope and location of the initiating event (e.g. location and size of a breach or punctuated shoreline erosion). The Supplement and the SDEIS inadequately evaluate the reasonably foreseeable environmental impacts and cannot support a “mix and match” approach.”

Response: *A “mixed and matched” approach was not selected as the Preferred Alternative. The Phased Approach/Rodanthe Bridge Alternative (Preferred) was assessed in the SSDEIS and in this FEIS.*

Comment: “The various bridge alternatives assessed in the SDEIS and the new alternatives evaluated in the Supplement all impact wetlands and will require authorization under Section 404 of the Clean Water Act. SDEIS at 2-116. The Pamlico Sound alternative impacts on wetlands and the aquatic environment are 4.18 to 4.84 acres of wetlands (depending on the terminus) including only .01 acres of CAMA wetlands. Of the alternatives assessed, the Parallel bridge/road north/bridge south alternative impacts by far the largest amount of wetlands: 78.2 acres of wetlands including 11.8 acres of CAMA wetlands. SDEIS at 4-58. The parallel bridge/all bridge alternative impacts the second largest amount of wetlands: 12.3 acres of wetlands including 2.2 acres of CAMA wetlands. *Id.* The parallel bridge/nourishment alternative would impact an extensive but unquantified amount of wetlands and waters. While the SDEIS states that this alternative would impact 4.3 acres of wetlands including .3 acres of CAMA wetlands, this estimate does not include extensive filling of near-shore waters associated with the required nourishment. *Id.* The SDEIS states that 6.3 miles of beach will be nourished every four years. SDEIS at 2-104. The SDEIS further notes that in addition to direct fill impacts, the parallel bridge/nourishment alternative would result in “additional impacts associated with dredging for sand and then nourishment of 6.3 miles (10.1 kilometers) of the seashore within the refuge.” SDEIS at 4-66.

The Supplement states that the Phased Approach would impact 3.1 acres of wetlands, including 0.3 acres of CAMA coastal wetlands. Supplement at 4-31. This lower wetland impact appears to be based on the assumption that sand movement will naturally fill wetlands prior to implementing “phases” that include wetlands that currently exist. Supplement at 4-31. This assumption fails to adequately consider the impacts from construction of the phases and the timing of the phases. As the Supplement acknowledges, construction impacts from the Phased Approach include constructing a service road that will be in service for decades. Also, when and where wetlands are naturally filled may or may not be within the same time frame as construction of the Phased Approach. Therefore, the Supplement may underestimate the wetland impacts by assuming that the Phased Approach will occur in coordination with the natural erosion and overwash cycle. Furthermore, if overwash occurs before a planned construction phase, the NCDOT will push back any sand to recreate dunes and to stabilize NC 12. This action prevents the natural filling of wetlands in the right of way, making it more likely that the actual construction of the Phased Approach will require the fill of jurisdictional wetlands. Again, these assumptions may underestimate the actual impact to wetlands from the Phased Approach.

These impacts must be assessed and considered in the 404 permit review as a part of the Phased Approach per 33 C.F.R. § 325.1 (d)(2):

All activities which the applicant plans to undertake which are reasonably related to the same project and for which a DA permit would be required should be included in the same permit application. District engineers should reject, as incomplete, any permit application which fails to comply with this requirement. For example, a permit application for a marina will include dredging required for access as well as any fill associate with construction of the marina. 33 C.F.R. § 325.1 (d)(2).

The Supplement summarily dismisses these impacts and fails to evaluate the total wetland impacts from the Phased Approach.

Furthermore, the total temporary and permanent biotic impacts (which include wetland impacts) from construction of either of the phased approaches are not insignificant (48.5 acres temporary biotic impact, Supplement to SDEIS, p. 4-30). The Pamlico Sound Bridge is a practicable

alternative with the least impact on aquatic ecosystems and wetlands, and is the only alternative assessed in the SDEIS or Supplement that may be permitted under Section 404.”

Response: *The wetland impact calculations for the Phased Approach alternatives (including the Preferred Alternative) in the SSDEIS and the FEIS assume the presence of the wetlands that currently exist. All project activities will be included in the Section 404 permit application for each phase, including temporary and permanent impacts. The Pamlico Sound Bridge was found not to be a practicable alternative because it is not economically viable. The NEPA/Section 404 merger process concluded that the Phased Approach/Rodanthe Bridge Alternative (Preferred) is the LEDPA.*

Comment: “Furthermore, the phased alternatives present a likely adverse impact to federally endangered populations of both piping plover (Supplement to SDEIS, p. 4-37) and green sea turtle (Supplement to SDEIS, p. 4-38). The supplement to the SDEIS incorrectly concludes that the phased alternatives would not likely adversely affect loggerhead sea turtles, based on observations from 2003 and 2004 (Supplement to SDEIS, p. 4-39). The area should be re-evaluated before making such conclusions. The eventual presence of bridge pilings in the surf or on the beach would certainly impact the quality of nesting habitat for this species.

The SDEIS states that a parallel bridge corridor is likely to adversely affect the threatened green sea turtle and piping plover. SDEIS at 4-71, 4-73. The Pamlico Sound Bridge alternative is not likely to adversely affect any federally protected species. SDEIS at 4-69 to 4-77. The Supplement changes the SDEIS biological conclusion for green sea turtles and piping plovers to “unresolved.” The SDEIS and Supplement inaccurately conclude that a parallel bridge corridor is not likely to adversely affect the threatened loggerhead sea turtle. SDEIS at 4-73. Loggerhead sea turtles are known to breed on the beaches within the project area and, as with green sea turtles, would likely to be adversely affected by a parallel bridge alternative.

The Supplement and the SDEIS fail to consider the impacts of a long-term construction schedule, as is proposed in the Phased Approach, required long-term nourishment, or any combination thereof on piping plover or sea turtles. It is of particular concern that the Supplement appears to propose any mix and match of short bridge construction, beach renourishment, and dune building. Each of these will have specific impacts on protected species, such as the piping plover and sea turtles, as well as impacts to the natural biota. For example, if nourishment is an integral part of a parallel bridge alternative, the adverse impacts to threatened or endangered species must be more completely assessed. Long-term nourishment of 6.3 miles of beaches on a four-year return interval within the project area would have adverse impacts on piping plover and sea turtles. Long-term nourishment has several adverse effects. By utilizing nourishment and large artificial dunes to protect NC 12, the nourishment will prevent overwash. Overwash is part of ecologically important inlet creation, migration and closure and over time, helps to create new moist sand intertidal feeding areas on the sound side. Without overwash, erosion continues to threaten sound side wetlands. By suppressing overwash, nourishment leads to loss of piping plover sound side feeding habitat and nesting habitat. In addition, the nourishment and artificial dune system prevents natural maintenance of existing habitat by increasing vegetative succession. Furthermore, nourishment may result in a steeper beach profile, reducing the available intertidal area. The Supplement fails to assess and evaluate the true impacts on fisheries, wildlife, and protected species and the Phased Approach therefore cannot be a permitted alternative.”

Response: *For the Phased Approach/Rodanthe Bridge Alternative (Preferred), FHWA has completed formal consultation with the US Fish and Wildlife Service under the requirements of Section 7 of the Endangered Species Act of 1973, as amended. Its findings are presented in Section 4.7.9 of the FEIS.*

Comment: “The SDEIS identifies continued access to the Refuge as an area of concern. We support continued public access to the Refuge, as stated above and in our comments on the SDEIS, as long as access is compatible with Refuge’s mission. We reiterate that access is not contingent upon maintenance of NC 12 and many public lands provide for public access in ways that are compatible with the nature of the public lands and associated resources. We strongly recommend that access be accommodated within a reasonable refuge management plan.

The Phased Approach, however, will not provide compatible access and will severely limit or eliminate fishing, surfing, birding, and other resource dependent activities. Because the Phased Approach does not provide access, eliminates Refuge uses, and threatens Refuge resources, it is not a viable alternative.”

Response: *The position of the commenter is acknowledged. The Phased Approach/Rodanthe Bridge Alternative (Preferred) was found to be the LEDPA. The Refuge could provide additional access opportunities if they wish, just as they have said they would with the Pamlico Sound Bridge Corridor Alternative.*

Comment: “The Supplement states that the life expectancy of a replacement bridge is estimated to be as long as 100 years (approximately 2110). Supplement at xxvii. Yet, the Supplement illogically truncates the cost estimates through 2060. A true accounting of the costs associated with the various alternatives should be calculated on a timeframe comparable to the life expectancy of the bridge, rather than the artificial project endpoint of 2060. By limiting the cost analysis to 50 years, any options that include long-term beach nourishment, dune rebuilding, or other shoreline stabilization have associated costs that are unfairly discounted. This limited cost analysis unfairly weights the cost against the Pamlico Sound Bridge. Furthermore, the cost estimates for the Phased Approach may also be affected by limiting the project life to 50 years. Given the higher wave energy and greater maintenance costs for a bridge in the ocean and the uncertainty associated with this unique approach, it is likely the Phased Approach costs are underestimated and unfairly exclude costs associated with an ocean-side bridge with a 100 year life span. Given that substantial public funds will be used for construction, the public should be informed of the maximum costs that could be incurred.”

Response: *The design life assumed in the SDEIS and SSDEIS was 50 years. The bridge structure components of the alternatives could potentially last longer than 50 years, possibly up to 100 years. Fifty years, however, is the design life typically assumed in bridge planning by NCDOT.*

Comment: “In addition, the Supplement notes that construction costs for all alternatives have increased. The costs, however, have not increased uniformly for all alternatives. For example, the Pamlico Sound Bridge construction costs have increased by approximately 2.25 times. Construction costs for the Parallel Bridge alternatives have only increased by 1.3 times. Such inconsistencies across alternatives raise concerns that the cost analysis is biased against the Pamlico Sound Bridge. We are concerned that the supporting documentation for the new costs is inadequate to support the revised analysis and strongly recommend revising the costs.”

Response: *Section 2.3.1.2 of the SSDEIS and Section 2.12.1.2 of the FEIS present the reasons for increases in construction cost between the SDEIS and the SSDEIS. The new costs prepared by NCDOT were verified by an independent consultant with bridge construction experience and the FHWA.*

Comment: “The Supplement cites to and appears to rely on a letter from the Secretary of Interior Dirk Kempthorne. Secretary Kempthorne addressed a letter to Senator Richard Burr in which he declared a preference for separating the replacement of Bonner Bridge from the realignment of NC 12. See Supplement Appendix A-2. This letter incorrectly states that a replacement of Bonner Bridge could be compatible, “if it is constructed within the same alignment or with minor changes to the current alignment.” *See id.* This unsupported analysis is in direct conflict with the National Environmental Policy Act (NEPA) and the National Wildlife Refuge Improvement Act.

As discussed more thoroughly above, the Refuge Act requires any use of a wildlife refuge to be “compatible” and not materially interfere with the purpose of the refuge or the mission of the refuge system. Because an evaluation of any proposed use (new or existing use) must include the direct and indirect impacts and include impacts that result from using adjacent lands or waters, the construction of a replacement bridge cannot be separated from maintenance of NC 12. To the extent that Secretary Kempthorne’s letter suggests that separation of the bridge from the road alleviates the need for a compatibility determination, the letter is in direct conflict with the Refuge Act and the Department of Interior’s implementing guidance.

Not only is the Secretary’s letter in conflict with the laws and regulations on “compatibility,” the severance of a replacement bridge from NC 12 may be in violation of NEPA. As discussed more fully above, NEPA prohibits improper segmentation of projects and requires that all direct, indirect, and cumulative impacts be evaluated in environmental impact statements.

Building a replacement bridge in a similar location to the existing Bonner Bridge necessitates a full environmental impact analysis of maintaining NC 12 through the Refuge. Secretary Kempthorne cannot segment the projects and avoid the associated NEPA analysis. The indirect and cumulative impact analysis cannot defer consideration of the effects of maintaining NC 12 in its current location. Building a Parallel Bridge alternative, including the Phased Approach, will forever marry maintenance of NC 12 in a manner and location that is fundamentally incompatible with an unpredictable environment. The decision to maintain NC 12 in its current location has environmentally devastating consequences that must be fully evaluated and cannot be severed from an environmental impact analysis of a replacement bridge.

We recognize the need to replace Bonner Bridge and support construction of a new bridge that provides dependable transportation to Hatteras Island, is environmentally sound, and is economically reasonable. We support the Pamlico Sound Bridge corridor alternative and believe that it satisfies these objectives.”

Response: *The SDEIS, SSDEIS, and FEIS do not evaluate the Oregon Inlet bridge separately from the long-term maintenance of NC 12. The Phased Approach/Rodanthe Bridge Alternative (Preferred) incorporates both an Oregon Inlet bridge and additional bridges that would provide for the long-term maintenance of NC 12.*

NC 12

Bonner Bridge Replacement Project

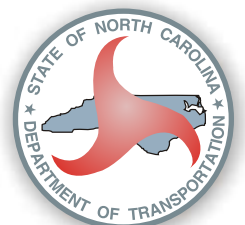
FINAL ENVIRONMENTAL IMPACT STATEMENT

Citizens' Summary and User Guide



U.S. Department of Transportation
**Federal Highway
Administration**

North Carolina
Department of
Transportation



Dear Citizen:

Thank you for your interest in the Final Environmental Impact Statement (FEIS) for the Bonner Bridge Replacement Project. The project consists of replacing Bonner Bridge and providing for the long-term retention of NC 12 between Rodanthe and Oregon Inlet.

The Bonner Bridge is near the end of its service life and needs to be replaced. Its role in the regional transportation network has only increased over the last 40 years as the area's desirability for residential development and as a tourist attraction has increased. The primary purpose of the proposed project is to provide a new means of access from Bodie Island to Hatteras Island for residents, businesses, services, and tourists prior to the end of Bonner Bridge's service life.

The purpose of this **Citizens' Summary and User Guide** is to answer both some commonly asked questions about the project as well as general questions about Environmental Impact Statements. This guide also provides an easy-to-follow summary of the major issues discussed in the NC 12 Replacement of Herbert C. Bonner Bridge FEIS. For in-depth discussion of these issues, please refer to the NC 12 Replacement of Herbert C. Bonner Bridge FEIS. The locations where you can view the FEIS are listed on page 14.

The NCDOT welcomes and values your input and involvement in this project. Stay informed about the project by adding your name to the project mailing list and/or visiting the project web site at <http://www.ncdot.org/projects/bonnerbridge/repairs/>. If you have questions or comments about the project or would like to be added to the project mailing list, please write, e-mail, or call:

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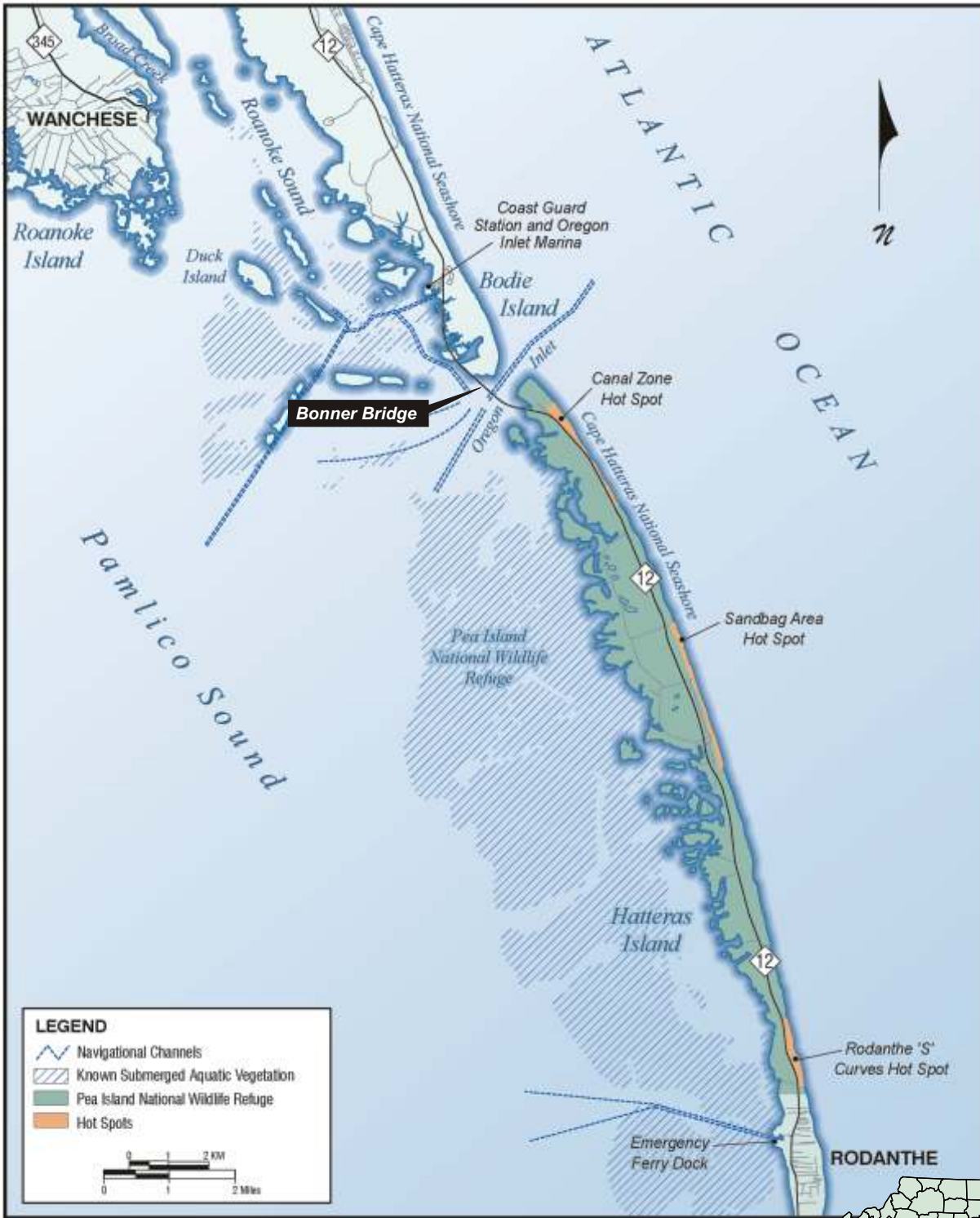
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BMP	Best Management Practices
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
LEDPA	Least Environmentally Damaging Practicable Alternative
NCDOT	North Carolina Department of Transportation
NCWRC	North Carolina Wildlife Resources Commission
NMFS	National Marine Fisheries Service
NPS	National Park Service
USFWS	United States Fish and Wildlife Service

Acronyms



Project Description

What is the Bonner Bridge Replacement Project?

The Herbert C. Bonner Bridge (Bonner Bridge), opened in 1963, crosses Oregon Inlet and connects Bodie Island with Hatteras Island (see map above). Bonner Bridge is a part of NC 12 and provides the only highway connection between Hatteras Island and the North Carolina mainland. The Bonner Bridge Replacement Project (the Project) consists of replacing Bonner Bridge and providing for the long-term retention of NC 12 between Rodanthe and Oregon Inlet. The Preferred Alternative consists of a new bridge over Oregon Inlet (west of Bonner Bridge), and the construction of additional bridges within the NC 12 easement from Oregon Inlet to Rodanthe as needed to retain NC 12 in light of both ongoing shoreline erosion and the potential for island breaches in that area.



Why is Bonner Bridge being rehabilitated now?

The latest Bonner Bridge Assessment Report regarding the condition of the bridge was completed in December 2006. The purpose of the report was to identify repairs that could extend the life of the bridge 10 additional years until a replacement bridge could be built. An additional assessment of the condition of the bridge is currently underway.

NCDOT is in the process of making repairs identified in the report. Crews completed repairs to the bridge's subcaps and pile jackets in March 2008. A subcap is a piece of concrete that is placed on top of an existing cap on a piling to help support a bridge's load. A pile jacket is a steel and concrete structure that wraps around a piling to reinforce it.

Repairs to the bridge's concrete started in March 2008 and remain under way. Crews are chipping out the deteriorated concrete using jackhammers and replacing it with shotcrete. Shotcrete is concrete applied at high pressure, which adheres quickly and easily to the existing structure. The work is scheduled to continue through November 2010.

Work is scheduled within the next 12 months to rehabilitate the bridge's fender system. Comprised of wood and steel, the fender system surrounds the pilings and works like a buffer between the concrete bridge and oncoming vessels, protecting the bridge in case of watercraft impact. The project is expected to take about six months to complete.

Why does the Bonner Bridge need to be replaced?

Since its opening in 1963, Bonner Bridge has required continual maintenance. Projects continue to this day to address the following problems:

- Concrete fragments breaking off of the supporting structures (spalling);
- Corroded steel reinforcing rods exposed by spalling; and
- Wave action that undermines the piles' ability to support the superstructure.

Despite these maintenance efforts, the Bonner Bridge is near the end of its service life and needs to be replaced. Its role in the regional transportation network has only increased over the last 40 years, as the area's desirability for residential development and as a tourist attraction has increased. The purposes of the proposed project are to:

- Provide a new means of access from Bodie Island to Hatteras Island for its residents, businesses, services, and tourists prior to the end of Bonner Bridge's service life. Demand for

convenient daily and emergency access across Oregon Inlet is expected to continue;

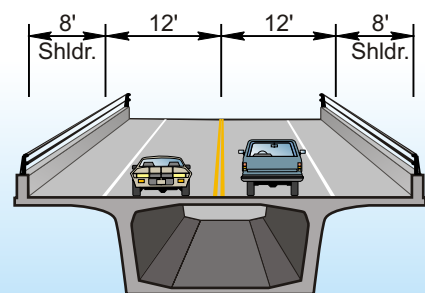
- Replace the bridge with a design that serves navigation needs, while also allowing natural channel movement and reducing future dredging needs; and
- Provide a replacement crossing that will not be endangered by shoreline movement through year 2050.

Why is the relocation of NC 12 to Rodanthe also a part of the project?

Bonner Bridge is a part of NC 12, the only road serving all of Hatteras Island. NC 12 is subjected to shoreline erosion and overwash, and requires regular post-storm closure and maintenance. There are three areas of high erosion along NC 12 between Oregon Inlet and Rodanthe, within the Pea Island National Wildlife Refuge (Refuge). These erosion "hot spots" are shown on the map on page 3. The operations of the Refuge are affected not only by NC 12 post-storm maintenance activities, but also by potential long-term solutions to ongoing shoreline erosion.

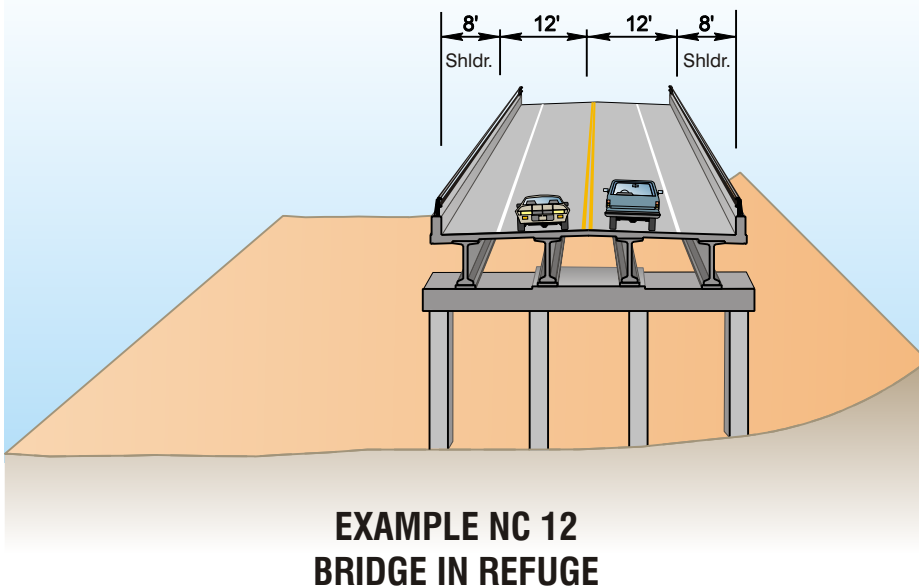
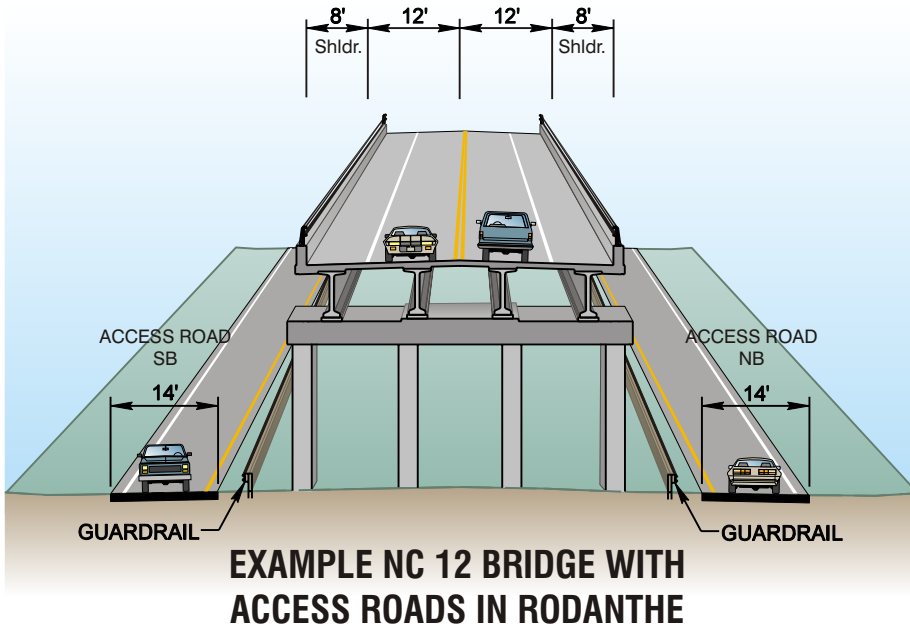
Thus, in order to help ensure NC 12 reliability over the life of the new bridge and to allow for the fullest range of possible alternatives to be considered, it was decided to examine the Bonner Bridge replacement and the long-term retention of NC 12 within a single project. If the project only included alternatives that terminate at the north end of Hatteras Island, other combined solutions, such as a long bridge that bypasses the Refuge, could not be considered.

EXAMPLE BRIDGE ACROSS OREGON INLET



What is the Preferred Alternative and when will it be built?

The Preferred Alternative is the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative (see map to the right). It was identified in August 2007 as the Least Environmentally Damaging Practicable Alternative (LEDPA) by partnering and cooperating environmental resource and regulatory agencies. The Preferred Alternative consists of a new bridge over Oregon Inlet (west of Bonner Bridge), and the construction of additional bridges within the NC 12 easement from Oregon Inlet to Rodanthe as needed. An example of the possible appearance of a new Oregon Inlet bridge is shown on page 4. Examples of the possible appearance of bridges in Rodanthe and through the Refuge are shown in the figures to the left. The final appearance of these bridges will be determined in final design.



The project would be built in four phases as shown on the map to the right. The Oregon Inlet bridge replacement is Phase I. The additional phases are described below; however, NCDOT recognizes that these phases could be adjusted based on funding availability and changing coastal conditions within the project area:

- Phase II (blue on map) would bridge three locations where NC 12 is most threatened by shoreline erosion at the north end of Hatteras Island and in the Rodanthe area, including four potential storm-related island breach locations;
- Phase III (pink on map) would bridge the next area expected to be threatened by shoreline erosion (south of the freshwater ponds in the Refuge), including a fifth potential storm-related island breach location; and
- Phase IV (yellow on map) would bridge the final two areas where NC 12 is predicted to be threatened by shoreline erosion in the area of the Refuge's freshwater ponds.

One section of NC 12 in the Refuge would not be bridged because it is not expected to be threatened by shoreline erosion before 2060.

NCDOT will continue to monitor the shoreline within the Refuge and Rodanthe to determine the bridge length and construction schedule for Phases II - IV.

The "Design-Build" contract (see page 12 for an explanation of Design-Build) for Phase I, the replacement of Bonner Bridge, will be awarded in 2009. Phase I is expected to be completed in 2014. The construction duration for Phases II through IV is estimated to be approximately three years. The project timeline, as of August 2008, is shown on page 12.

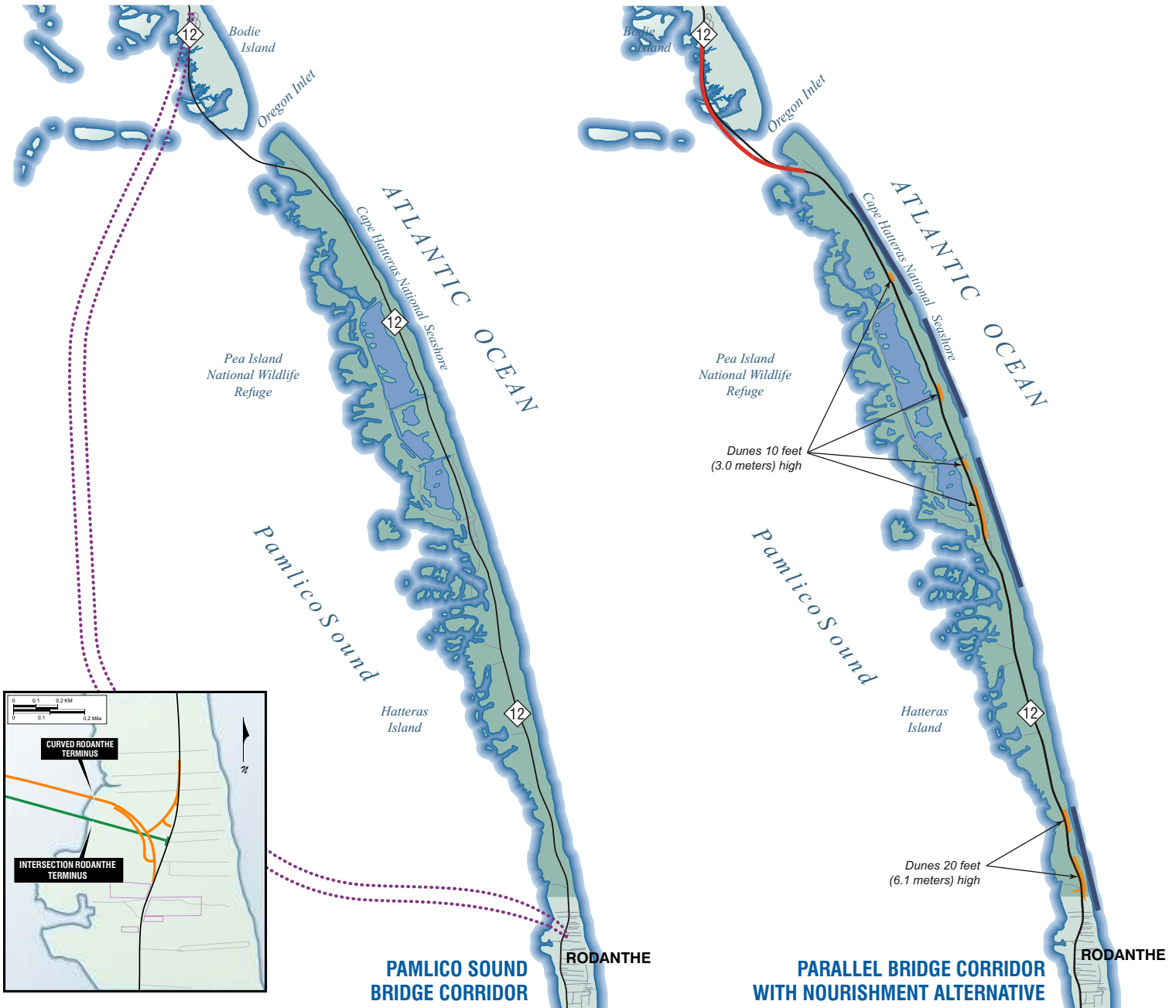
How much will the Preferred Alternative cost, and how will it be financed?

The total projected cost of the Preferred Alternative ranges from a low of \$1.2 billion to a high of \$1.5 billion. This cost includes the new bridge over Oregon Inlet, demolition of the existing Bonner Bridge, all costs associated with construction of NC 12 roads and bridges (Phases II to IV), removal of the existing NC 12 pavement, additional right-of-way purchased on Bodie Island and in Rodanthe, wetland mitigation, and all operation and maintenance costs through 2060.

NCDOT will use transportation funds allocated in the State Transportation Improvement Program (TIP) for construction of the proposed project. By constructing the project in phases, construction costs can be spread-out over multiple TIP funding cycles; this way, the necessary funds can be planned for and spent as they become available.

PARALLEL BRIDGE CORRIDOR WITH PHASED APPROACH ALTERNATIVES





What other alternatives did you consider and why are they not preferred?

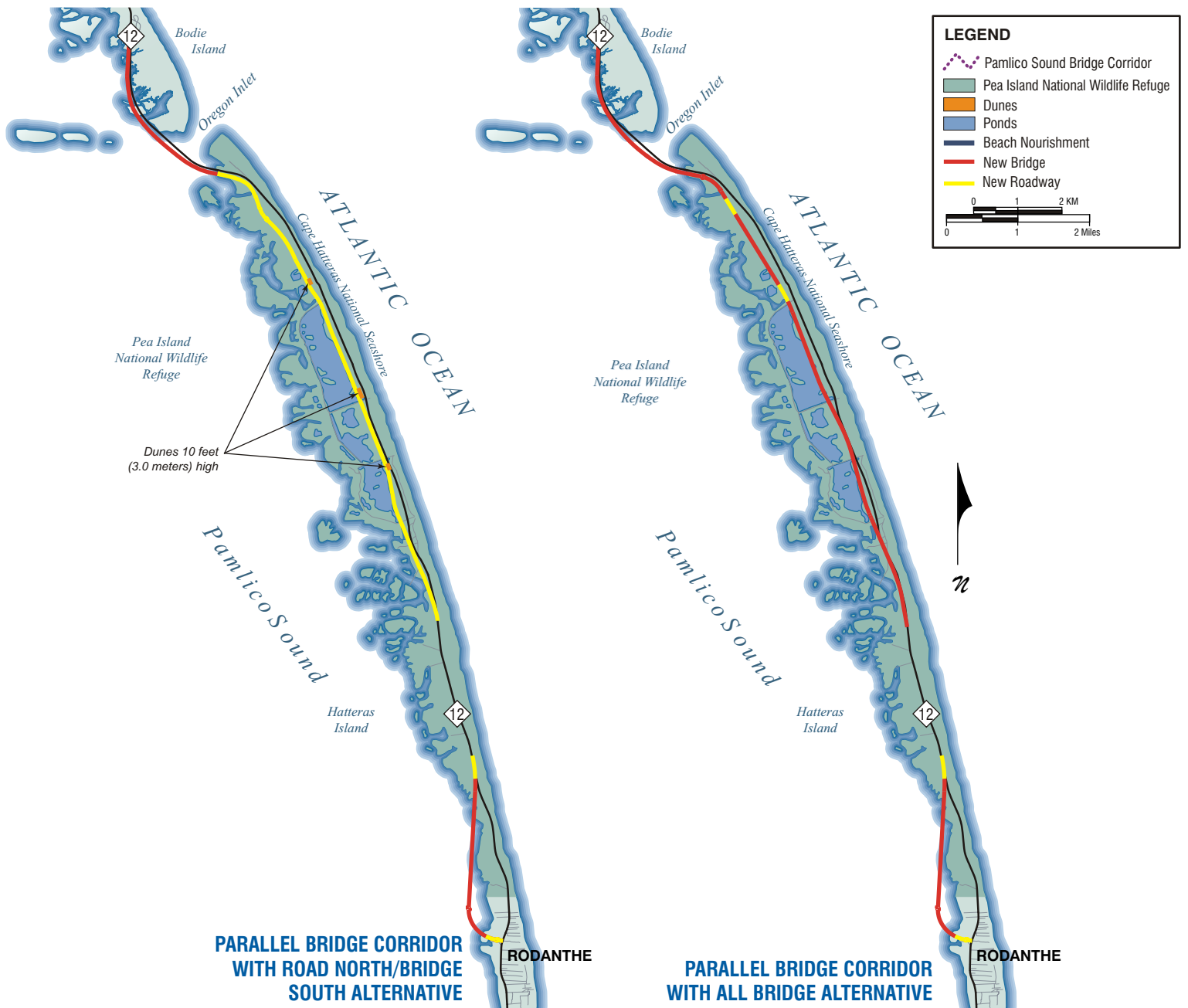
Numerous alternatives were studied throughout the course of this project. The Final Environmental Impact Statement (FEIS) documents the analysis and comparison of seven alternatives within two corridors: the Pamlico Sound Bridge Corridor and the Parallel Bridge Corridor (see maps).

The two Pamlico Sound Bridge Corridor alternatives would both involve building a new 17.5 mile bridge through Pamlico Sound, extending as far as 5 miles west of Hatteras Island, starting at the northern terminus of Bonner Bridge and connecting back into existing NC 12 in Rodanthe. The two alternatives only differ in the way they connect to NC 12 in Rodanthe (see inset map). One bridge alternative would curve into NC 12, and bridge traffic would simply merge with NC 12. The other bridge alternative would

intersect with NC 12, and bridge users would turn right at a “T” intersection to continue on NC 12.

Five Parallel Bridge Corridor alternatives were studied:

- The **Nourishment Alternative** would maintain NC 12 in its current location, through the Refuge and into Rodanthe, by the implementation of beach nourishment and dune enhancement.
- The **Road North/Bridge South Alternative** would place NC 12 on a bridge west of Hatteras Island between northern Rodanthe and the southern part of the Refuge. In the northern part of the Refuge, NC 12 would be relocated onto an at-grade road to the west of the forecast 2060 high erosion shoreline.
- The **All Bridge Alternative** would include the same bridge as the Road North/Bridge South Alternative in northern Rodanthe and the southern part of the Refuge; but would relocate NC 12 on a bridge



to the west of the forecast 2060 high erosion shoreline through the northern section of the Refuge.

- The two **Phased Approach Alternatives** (see map on page 6) would both maintain NC 12 in its current location in the Refuge and northern Rodanthe by elevating NC 12 onto bridges in phases. However, the alternatives differ in the Rodanthe area. The Preferred Alternative (**Phased Approach/Rodanthe Bridge**) assumes NC 12 is elevated into Rodanthe. The other alternative (**Phased Approach/Rodanthe Nourishment**) assumes that NC 12 is maintained in its existing location through northern Rodanthe by beach nourishment at the southern end of the Refuge and in the northern part of Rodanthe.

Various potential Oregon Inlet crossing alternatives were considered in early studies and found not to merit detailed analysis. These early alternatives included the feasibility of rehabilitating Bonner Bridge, replacing Bonner Bridge with ferry

service, building a tunnel, and several other locations for the bridge replacement and NC 12 relocation.

The decision to select the Phased Approach/Rodanthe Bridge Alternative as the Preferred Alternative was made after careful consideration of the advantages and disadvantages of all the alternatives. Key considerations included environmental impacts, Refuge impacts, relocations of homes and businesses, constructability, future coastal conditions, funding, and federal law. Many of the environmental resource and regulatory agencies preferred the Pamlico Sound Bridge Corridor, but it was found to be not practical because of the unavailability of funds for a single project of such a large magnitude built in a single phase. The Preferred Alternative was selected primarily because it could be built in phases, making it affordable, and because it would not use land from the Refuge by remaining in the existing NC 12 easement. All other Parallel Bridge Corridor alternatives used Refuge lands outside the NC 12 easement.

Project Impacts

What are the environmental impacts of the Preferred Alternative?

In the Cape Hatteras National Seashore?

The Preferred Alternative would require the permanent use of 6.3 acres of the Seashore on Bodie Island for permanent fill and right-of-way over land. The existing Bonner Bridge also uses approximately 6.3 acres of land on Bodie Island. Land within the Seashore currently occupied by Bonner Bridge would be returned to the Seashore after the bridge is demolished and removed.

Construction activities for the Preferred Alternative also may require dredging, a haul road, and/or a work bridge within the portions of the Seashore in Pamlico Sound.



Visitors enjoy the beach at Cape Hatteras National Seashore

In the Pea Island National Wildlife Refuge?

Storm-related NC 12 maintenance for the existing roadway would continue, but in progressively fewer locations, until all phases of the Preferred Alternative are completed. Once complete, the bridges would be a sizable new linear man made feature for approximately 10 miles within the Refuge. The Preferred Alternative would be built and maintained within the existing NC 12 easement through the Refuge, so no new Refuge lands would be used. The Refuge's remaining undisturbed beaches would naturally erode, thereby altering the shoreline and wildlife currently using that habitat.

While paved road access would continue through the Refuge with the Preferred Alternative, only two public access points would be maintained (one at the north end and a second south of the ponds). Ultimately, bridge piles in the



ocean could change the types of fish that congregate around the shore. Other activities on the beach front also would be affected, but not precluded, by the presence of the bridge and bridge piles in areas where the Preferred Alternative would be over the beach. Once the bridge piles are in the ocean, surfing and other recreational ocean activities would be adversely affected, but not eliminated, in those areas.

In Rodanthe?

The Preferred Alternative would extend approximately 1.1 miles south of the Refuge boundary into Rodanthe. Access to homes and several local businesses in northern Rodanthe along NC 12 would be provided via one-way frontage roads on either side of the bridge instead of directly from NC 12 (see example on page 5).

The Preferred Alternative would have a sizable visual effect on Rodanthe, introducing into views an elevated roadway for 1.1 miles.

The elevated structure would impede the views of people on the sound-side of NC 12 looking east towards the Atlantic Ocean, as well as people on the ocean-side of NC 12 looking west. Views could be blocked by the elevated structure as high as the third or fourth story of residences, and it would be a dominating presence at ground level, particularly for the approximately 90 homes and businesses along NC 12 that would be within 100 feet of the new bridge.

Although two homes and one commercial building would be displaced by the construction of the Preferred Alternative, potential relocation sites exist within the project area. In addition, gas pumps located along NC 12 at the Liberty service station and the North Beach Beach Mart convenience store would be displaced.

What is NCDOT's Property Acquisition and Relocation Process?

Private property in the path of the Preferred Alternative will be purchased by the NCDOT. NCDOT pays fair market value for all property purchased. Third-party, licensed real estate appraisers determine a fair market value at the time of purchase. This is the same type of appraisal that is required when selling, buying, or refinancing a property.

Renters and homeowners who are relocated by the project have access to several programs to minimize the inconvenience of relocation: relocation assistance, relocation moving pavements, and relocation replacement housing payments of rent supplements. At least one relocation officer will be assigned to assist homeowners, renters, and owners of displaced businesses to search for and move to replacement property.

For more information regarding the right-of-way acquisition and relocation processes, please contact NCDOT's Division 1 Right-of-Way Office in Ahoskie at (252) 332-8182.

To historic resources?

At the former Oregon Inlet US Coast Guard Station (listed on the National Register of Historic Places), the greater height of the Preferred Alternative would alter the historic view and setting of the station.

The historic views and setting of the Chicamacomico Life Saving Station and several nearby houses that form the National Register-eligible Rodanthe Historic District would be altered with the Preferred Alternative.

The elevated structure of the Preferred Alternative would cause a sizable visual impact on the historic landscape of the Refuge, and would also lead to a loss of access to some Refuge facilities and natural features.

To recreational opportunities?

Charter fishing boats operating out of the Seashore's Oregon Inlet Marina and Fishing Center would not be able to use the channel known as "the crack," adding about 30 minutes to the time it currently takes to travel from the fishing center to the ocean.



Chicamacomico Life Saving Station



Former Coast Guard Station at Oregon Inlet

Rodanthe view from America Drive North



The popular catwalks on Bonner Bridge are not part of the replacement bridge, which would be approximately three times higher. However, options remain for retaining fishing access at Oregon Inlet.

Bridge piles in the ocean off Hatteras Island and along the beach would adversely affect, but not eliminate, beach front activities such as fishing, hiking, surfing, wind surfing, kite boarding, swimming, ocean kayaking, and birding.

Opportunities to stop and park for ocean and beach access would be limited to two locations: at the north end of the Refuge and south of the ponds.

To coastal change?

With the Preferred Alternative's new crossing over the Oregon Inlet, future dredging operations in the channel would be easier to undertake and could be reduced in frequency and magnitude.

The Preferred Alternative's use of elevated bridges, instead of roadway on fill, would allow natural channel flow and minimize coastal impacts caused by maintenance and artificial stabilization. As the shoreline naturally erodes, by 2060, most of the NC 12 bridges associated with the Preferred Alternative would be in the ocean.

When exposed to waves, tides, and storm events, the presence of the Preferred Alternative's bridge piles would alter the flow pattern around the piles, resulting in scour, effects on cross-shore transport during storm events, formation of additional rip currents, and changes in beach erosion and accretion patterns.



Hot Spots on NC 12



To natural resources?

During construction of the Preferred Alternative, construction barge traffic, fill and pile placement, and construction channel dredging would cause short-term water quality impacts. Long-term impacts to water quality include highway runoff that may contribute pollution to nearby ecosystems. The NCDOT would incorporate Best Management Practices (BMPs) applicable to controlling bridge deck runoff for all project segments traversing the receiving water bodies.

The Preferred Alternative would fill approximately 16.2 acres of biotic communities, including 3.1 acres of jurisdictional areas (0.5 acre of wetland and 2.6 acres of open water). Temporary traffic maintenance roads also would cause 48.5 acres of temporary biotic community impact, including 12.5 acres of temporary wetland impact. The habitat affected by the completed bridges would change over time as the shoreline erodes under the bridges. The maximum length of bridge over the ocean would be 8 miles in 2060. The maximum length of bridge over beach habitat would be 3.3 miles in 2020.

Most of the impact to essential fish habitat with the Preferred Alternative would be temporary, localized, and associated with bridge construction, leading to increased turbidity, noise, and siltation. Some permanent loss or alteration of essential fish habitat would result directly from shading and pile placement.

The Preferred Alternative would likely result in adverse impacts to four of the 13 protected species in Dare County: piping plover, leatherback sea turtle, green sea turtle, and loggerhead sea turtle. The Preferred Alternative also would likely result in adverse impacts to the proposed critical habitat north of Oregon Inlet for wintering piping plovers.

To utilities?

Telephone and electrical lines on Bonner Bridge would be relocated to the new bridge. Those along NC 12 on Hatteras Island would need to be moved one or more times by 2060 in response to shoreline erosion.

What commitments does NCDOT intend to make to minimize impacts?

NCDOT is making numerous design and construction commitments for the project in order to minimize impacts. The list below is not a comprehensive list of the Project Commitments, but includes several thought to be of particular

interest to the public. Please see the Project Commitments sheets printed on green paper in the FEIS for a complete list of the Project Commitments.

Design-Related Commitments

- All bridges will accommodate bicycles via 8-foot shoulders on both sides of the bridge and bicycle-safe bridge rails.
- Design and construction will be coordinated with utility providers in the project area in order to prevent interruption of local utility services.

Water Quality/Threatened and Endangered Species Commitments

- Protect water quality during construction by the use of Best Management Practices (BMPs) for sedimentation and erosion control measures.
- Minimize sediment clouding the water (turbidity), when possible and practicable, by working from temporary bridges and using BMPs for storage and disposal of construction and demolition materials.

Photo courtesy of USFWS Digital Library (USFWS web site, 2007)



Piping Plover

Photo courtesy of USFWS Digital Library (USFWS web site, 2007)



Loggerhead turtle (with transmitter)

- Construction contracts would require compliance with USFWS guidelines for avoiding construction impacts to the West Indian Manatee.
- NCDOT will comply with NMFS guidelines that restrict in-water construction-related activities when sea turtles and smalltooth sawfish are observed in the project area.
- Implement conservation measures to protect shortnose sturgeon, including no hopper dredging and measures to minimize habitat degradation.
- Survey the project area for seabeach amaranth habitat at least one year prior to initiating bridge construction activities, and re-survey, as needed, for each construction phase of the Preferred Alternative.
- Based on conditions specified by the USFWS related to protecting piping plovers and sea turtles, the NCDOT will implement design and construction measures to:

- **Piping plover** – avoid disturbing nesting piping plovers; to the extent possible, avoid disturbing foraging and roosting plovers; and avoid or minimize opportunities for avian predator perches.

- **Sea turtles** – avoid disturbing nesting sea turtles, nests, and hatchlings; educate construction contractors and pertinent

What is Design-Build?

The NCDOT's Design-Build Program affords NCDOT with a powerful tool to deliver appropriate projects in an expedited and value-driven manner. NCDOT personnel, across various disciplines and divisions, work in concert to select, develop, and administer projects conducive to the design-build method of contracting.

The design-build process combines into a single contract the final design and construction services necessary to construct a project. Design-build projects allow contractors to participate in design and designers to participate in constructability issues. This interaction allows designers and contractors to marry their expertise and resources to best suit a specific project. The resulting integration of design and construction typically expedites construction, facilitates environmental responsibility and permitting, and may reduce overall project delivery costs. Design-build contracting is implemented in accordance with NCDOT and other specifications and standards.

- Implement a coastal monitoring program on Hatteras Island within the project area, the particulars of which would be developed in association with representatives of the Refuge, in order to make decisions related to the future implementation of Phases III and IV.

How do the impacts of the Preferred Alternative compare with the impacts of other alternatives considered?

The table on page 13 presents a summary comparison of the seven detailed study alternatives considered. Presented is information related to: construction, social, economic, and cultural impacts (i.e., alternative cost and length, business and residential relocations, community impacts, cultural resources impacts, and utility impacts); Refuge and coastal conditions impacts (i.e., Refuge access, fishing access, use of Refuge land, visual impacts, potential for storm-related breaches of NC 12, and economic impact of a breach); and natural resources impacts (i.e., biotic communities and protected species impacts).

What happens next and when will the replacement of Bonner Bridge with a new bridge over Oregon Inlet be completed?

Next steps are presented in the timeline below. Following the release of the FEIS, comments may be submitted to NCDOT for 30 days. Public review locations and an address for sending comments are included on page 14 of this summary and in the FEIS. At the end of the period, NCDOT will release a Record of Decision (ROD), which will affirm the Preferred Alternative as the alternative selected for implementation and respond to any comments on the FEIS. Once the ROD is released, NCDOT can proceed with letting a contract for the design and construction of Phase I, the Bonner Bridge replacement over Oregon Inlet.

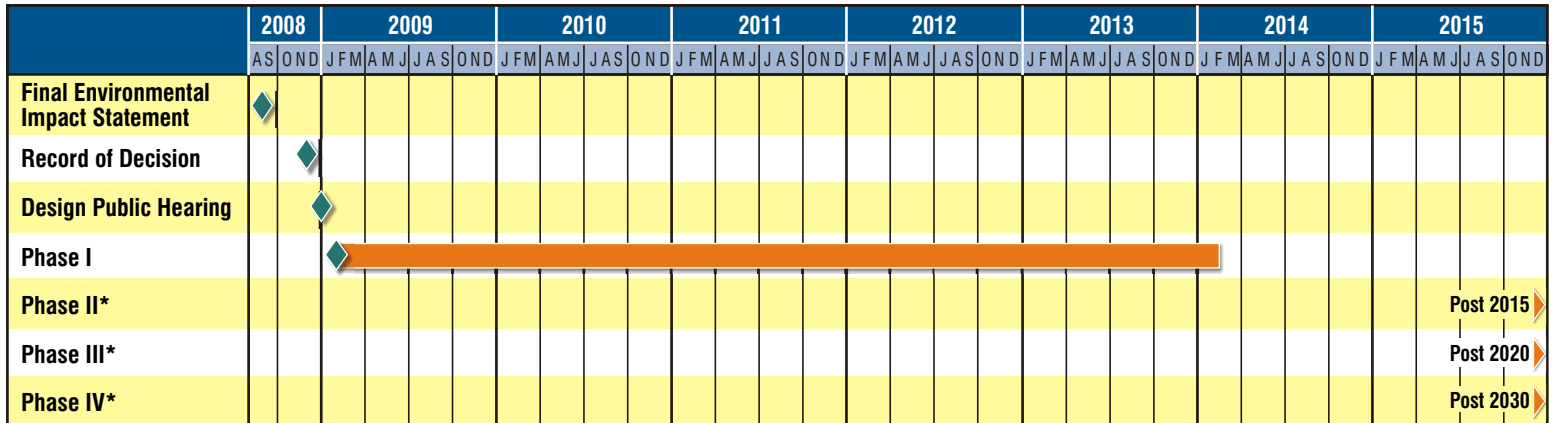
The construction contract for Phase I, the replacement of Bonner Bridge, will be awarded in 2009. Phase I is expected to be completed in 2014. The NCDOT plans to build the new Oregon Inlet bridge as a "Design-Build" project (see inset above for further information on Design-Build).

NCDOT staff as to the adverse effects of artificial lighting on sea turtles; minimize the effects of construction lighting on nesting sea turtles and hatchlings; minimize the effects of vehicle headlights from the completed bridge; and avoid permanent light fixtures.

Construction Commitments

- If any historic archaeological resources are uncovered, stop any construction work affecting the resource until the resource can be identified and assessed for eligibility for the National Register of Historic Places.
- Work with NPS and USFWS to determine areas near project construction where night lighting would need to be avoided or limited. During turtle nesting season (May 1 to November 15), night lighting will meet conditions specified by the USFWS to protect sea turtles. Night lighting also would not be used close to areas where people sleep, including the campground at the northern end of the project area and the Rodanthe area at the southern end.

PROJECT TIMELINE (as of August 2008)



*These dates are preliminary. Construction of Phases II to IV will be completed as soon as it is practicable.

	Pamlico Sound Bridge Corridor		Parallel Bridge Corridor				
	Curved Rodanthe Terminus	Intersection Rodanthe Terminus	Nourishment	Road North/ Bridge South	All Bridge	Phased Approach/ Rodanthe Bridge (Preferred Alternative)	Phased Approach/ Rodanthe Nourishment
Construction, Social, Economic, and Cultural Impacts							
Total Highway Cost through 2060 (in millions of 2006 dollars)*	\$1,305.6 - \$1,797.6	\$1,299.1 - \$1,788.1	\$671.8 - \$970.4	\$602.2 - \$740.2	\$1,107.7 - \$1,435.3	\$1,171.5 - \$1,497.1	\$1,149.1 - \$1,524.4
Length (miles)	18.0	17.8	15.9	16.0	15.9	16.0	15.2
Residential Relocations	6	5	0	2	2	3	0
Business Relocations	6	1	0	0	0	1 plus two partially affected	0
Rodanthe Community Cohesion, Accessibility, and Visual Impacts	Views of Pamlico Sound from homes along shoreline in Rodanthe would be affected.		None	Views of Pamlico Sound from homes along shoreline in Rodanthe would be affected.		1 mile of bridge would bisect community; access more circuitous; views in Rodanthe affected.	0.3 mile of bridge would bisect community; access more circuitous; views in Rodanthe near the Refuge affected.
Cultural Resources with Adverse Effect	1 - (former) Oregon Inlet US Coast Guard Station			3 - Refuge, (former) Oregon Inlet US Coast Guard Station, and Rodanthe Historic District and Chicamacomico Life Saving Station			2 - Refuge and (former) Oregon Inlet US Coast Guard Station
Cost to Relocate Utilities (in millions)	\$53.9		\$12.1	\$15.0	\$17.4	\$17.4	\$17.4
Refuge and Coastal Conditions Impacts							
General Refuge Access	Likely loss of the paved road within the Refuge. USFWS would need to provide alternate access.		Little change in access. Refuge facilities protected from future beach erosion.	Paved road access maintained but with some changes.	Access focused on three points; direct access to some Refuge facilities lost.	Access focused on two points; direct access to some Refuge facilities lost.	
Refuge Fishing Access	No fishing catwalks at north end of Hatteras Island. No paved road access to other fishing locations in Refuge.		No fishing catwalks; alternate access possible; beach fishing access unaffected.	No fishing catwalks; alternate access possible; beach fishing access maintained except at southern end.	No fishing catwalks; alternate access possible; beach fishing access limited to 3 locations.	No fishing catwalks; alternate access possible; beach fishing access limited to 2 locations.	
Use of Refuge Land Outside of Existing Easement (acres)	No use.		19.9 acres used primarily for new dunes plus periodic nourishment of 6.3 miles of seashore.	93.4 acres used primarily for new highway easement.	92.2 acres used primarily for new highway easement.	No use, project contained within existing highway easement.	Minor amount used for periodic nourishment of 1,500 feet of seashore; generally contained within existing highway easement.
Visual Impacts	None		Minimal; associated with limited new dunes.	Low	Sizable visual intrusion into the landscape of the Refuge.		
Potential for Breach and Need for Closing Breach to Maintain NC 12	Eliminates breach concerns by bypassing the Refuge. No need to close future breaches.		Nourishment would reduce the risk of a breach. Any breaches through the Refuge would need to be closed.	Breaches in northern portions of the Refuge would need to be closed; a deep breach near the terminal groin could be difficult to fill with sand.	Potential breach areas bridged. No need to close future breaches.	Potential breach areas bridged. Phases II and III may need to be accelerated, if a breach occurred before all four phases are completed.	
Economic Impact of a Breach	Not applicable.		Economic impact (reduction in retail sales) of a breach open for three months would be \$5.7, \$46.3, and \$146.7 million in the off-peak, middle, and peak season; jobs and tax revenue also would be lost.				
Natural Resources Impacts							
Biotic Communities Impacts (acres)							
Submerged Aquatic Vegetation (SAV)	0.31	0.30	0.20	1.40	1.40	0.20	0.20
Wetlands	1.84	1.18	1.68	50.74	6.68	0.47	0.44
Uplands - Natural & Man Dominated	7.97	6.66	20.30	13.45	4.89	13.13	6.45
Impoundments	0.00	0.00	0.00	22.11	0.43	0.00	0.00
Aquatic Bottom	2.69	2.70	2.40	3.90	3.82	2.44	2.44
Total	12.81	10.84	24.58	91.60	17.22	16.24	9.53
Protected Species Adversely Affected							
Piping Plover	Not likely to adversely affect.		Likely construction/demolition disturbance to nesting; potential nesting, foraging, and roosting habitat lost.				
Leatherback Sea Turtle/Green Sea Turtle/Loggerhead Sea Turtle	Not likely to adversely affect.		Likely disturbance to nesting on beach; not likely to adversely affect in ocean.				
Seabeach Amaranth	Not likely to adversely affect.		Beach nourishment could impact habitat.	Not likely to adversely affect.			Beach nourishment could impact habitat.

*Total highway cost includes the new Oregon Inlet bridge, Bonner Bridge demolition, all costs associated with construction of NC 12 roads and bridges (Phases II to IV), removal of the existing NC 12 pavement, additional right-of-way on Bodie Island and in Rodanthe, wetland mitigation, and all operation and maintenance costs through 2060.

Navigating the Final Environmental Impact Statement (FEIS)

The FEIS documents the purpose and need for the project; describes existing and projected conditions in the project area; identifies the seven detailed study alternatives in two corridors; and assesses the direct, indirect, and cumulative impacts of these alternatives, including community, visual, cultural resource, natural resource, and environmental quality considerations.

The public often finds the size and amount of information contained in an Environmental Impact Statement (EIS) overwhelming. The content of the document is dictated by the multiple interests it was written to serve. An EIS must provide information of interest to the general public, as well as that required by law and federal and state resource agencies and of concern to special interest groups.

When reviewing the FEIS, we suggest you begin with the Summary, which contains an overview of the contents and key issues within the FEIS. A detailed Table of Contents is presented next, which can help direct you to sections of particular interest to you. At the end of Volume 1, an index can help you locate discussions of specific topics. Following is a more detailed description of the content of some of the sections of the FEIS:

The section printed on green paper presents NCDOT's commitments to reduce potential environmental impacts during project construction and operation. These are commitments unique to this project and its setting. Many other routine commitments, such as replacement of wetlands lost and paying the relocation costs of people and businesses displaced, are noted as applicable throughout the FEIS.

Chapter 2 provides descriptions of the No-Action Alternative, the preliminary alternatives (e.g., tunnel, ferry, etc.), and the seven detailed study alternatives. Chapter 2 also discusses each alternative's ability to serve the project's Purpose and Need.

Chapter 3 describes the existing conditions in the project area. Topics include community resources, cultural resources, natural resources, air quality, and noise.

Chapter 4 contains the same or similar sections as Chapter 3, but discusses the project's potential direct, indirect, and cumulative impacts with respect to each of these topics.

Chapter 5 is the Section 4(f) Evaluation. This evaluation is required because the Preferred Alternative would use land from the Seashore on Bodie Island. FHWA cannot approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge without preparing a Section 4(f) Evaluation.

Chapter 6 lists the preparers of the document; **Chapter 7** lists locations where the document may be viewed as well as other agencies who receive a copy; and **Chapter 8** summarizes the public and agency comments on previous environmental documents and coordination performed over the course of the project.

FEIS Review Locations

The FEIS is available for public review at the following locations and on line at <http://www.obtf.org> under "OBTF Documents" and <http://www.ncdot.org/projects/bonnerbridgerepairs/>.

Fessenden Recreation Center
46830 NC Highway 12
Buxton, NC

**Dare County Planning & Inspections
Satellite Office**
49815 NC Highway 12
Buxton, NC

Dare County Library
56658 NC Highway 12
Hatteras, NC

Dare County Library
400 Mustian Street
Kill Devil Hills, NC

Dare County Planning Department
2601 N. Croatan Highway
Kill Devil Hills, NC

Dare County Library
700 Highway 64/264
Manteo, NC

**County Manager's Office
Dare County Administration Building**
211 Budleigh Street
Manteo, NC

**NCDOT
Resident Engineer's Office**
349 Waterplant Road, Unit B
Manteo, NC

**NCDOT
Highway Division 1 Office**
113 Airport Drive, Suite 100
Edenton, NC

**NCDOT
District 1 Office**
1929 North Road Street
Elizabeth City, NC

Rodanthe Post Office
25969 Highway 12
Rodanthe, NC

Comments on the FEIS should be sent to Greg Thorpe at the address below by October 27, 2008.

Mr. Gregory J. Thorpe, Ph.D.
NC Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

**Final Environmental Impact Statement
and Section 4(f) Evaluation**

**NC 12 Replacement of
Herbert C. Bonner Bridge**

Federal-Aid No. BRS-2358(15)
NCDOT Project Definition: 32635
TIP Project No. B-2500
Dare County, North Carolina

FHWA-NC-EIS-93-01-F
Federal Highway Administration
North Carolina Division

Prepared by Parsons Brinckerhoff
for the North Carolina Department of Transportation
and the Federal Highway Administration