

Appendix E



United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office

Ecological Services

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Pleasantville, New Jersey 08232

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In Reply Refer To:
13-I-0075

Minas M. Arabatzis, Chief
Planning Division
U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building, 100 Penn Square East
Philadelphia, Pennsylvania 19107-3380

JAN 8 2013

Dear Mr. Arabatzis:

The U.S. Fish and Wildlife Service (Service) has received your letter dated December 20, 2012 regarding the proposed designation of a sand borrow area within Little Egg Inlet between Little Egg Harbor Township, Ocean County and Galloway Township, Atlantic County, New Jersey. In your letter, you inform us that your office will prepare a draft Environmental Assessment (EA) to gather and evaluate data pertaining to the proposed project site. The proposed sand borrow area would provide material for beach nourishment between Barnegat Inlet and Little Egg Inlet. Approximately 4.95 million cubic yards of sand would be needed for initial berm placement and 2.45 million cubic yards for dune placement, with 1.9 million cubic yards needed for periodic re-nourishment every seven years over a 50-year period. The Service offers the following preliminary comments and recommendations for the protection of federally listed species and as technical assistance in formulating the draft EA.

AUTHORITY

The following comments on the proposed action are provided pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*), the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act of 1918 (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703-712), and the Wilderness Act of 1964 (16 U.S.C. 1131 *et seq.*), and do not address all Service concerns for fish and wildlife resources. Additional comments are provided as technical assistance for the draft EA and do not preclude further comment pursuant to the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 *et seq.*) (NEPA).

STUDY AREA

The open waters of Little Egg Inlet are State-owned. The salt marshes along the mainland and adjacent uplands are part of the Edwin B. Forsythe National Wildlife Refuge (Forsythe NWR) and are managed by the Service, including part of the Brigantine Wilderness and the Holgate Unit, also designated as a wilderness area. The northern part of Brigantine Island is designated as the North Brigantine Natural Area managed by the New Jersey Department of Environmental Protection. The New Jersey Natural Heritage Program recognizes several Priority Sites for Biodiversity within and in the vicinity of the study area. Some of these sites are listed here along with their biodiversity ranks: Brigantine Island (B2 - very high biodiversity significance), Little Beach Island (B2), Little Egg Inlet Macrosite (B2), and North Brigantine Island (B3). B-rank occurrences have good ecological integrity (B2: imperiled – B3: vulnerable). They include lightly disturbed plant communities and communities that were disturbed in the past, but have recovered and now have relatively natural composition and structure. The Forsythe NWR has been designated as a Wetlands of International Importance under the Ramsar Convention. The lower Mullica River and Great Bay, including Reeds, Somers, and Little Bays, Little Beach Island, and North Brigantine Island, have been designated a National Estuarine Research Reserve for research and education to be managed by the New Jersey Division of Fish, Game and Wildlife and Rutgers University. The Service has designated the Brigantine Bay wetlands as a priority wetland site under the Federal Emergency Wetlands Resources Act of 1986.

FEDERALLY LISTED AND CANDIDATE SPECIES

Piping Plover

The federally listed (threatened) piping plover (*Charadrius melodus*) is known to nest on beaches adjacent to the Little Egg Inlet (North Brigantine Natural Area and Holgate Unit). The Service recommends that the U.S. Army Corps of Engineers (Corps) provide a list of conservation measures in the draft EA for piping plovers. The Corps must also demonstrate that borrowing large quantities of sand from Little Egg Inlet will not result in loss of nesting beaches into the sand borrow area and adverse effects to piping plovers.

Furthermore, as a reminder of Service and New Jersey Endangered and Nongame Species Program previous meetings and conversations with the Corps and New Jersey Bureau of Construction Engineering regarding short and long-term impacts of inlet borrow areas on piping plover nesting habitats, we continue supporting and recommending long-term assessments and studies of shoreline movements within inlets following sand borrowing. Specifically, the Service requests that the Corps provide all available data on historical shoreline movement and sand migration within Little Egg Inlet to this office.

Red Knot

The red knot was added to the list of Federal candidate species in 2006. Red knots are federally protected under the MBTA, and are State-listed as threatened.

Small numbers of red knots may occur in New Jersey year-round, while large numbers of birds rely on Atlantic and Delaware Bay stopover habitats during the spring (mid-May through early June) and fall (late-July through October) migration periods. Red knots may occur within the study area during fall migration. Red knots winter at the southern tip of South America and breed above the Arctic Circle. Flying more than 9,300 miles from south to north every spring and reverse the trip every autumn, the red knot is one of the longest-distance migrating animals.

Candidate species are species that the Service has determined warrant listing under the Endangered Species Act and await formal listing. Although these species receive no substantive or procedural protection under the Endangered Species Act until formal listing, the Service encourages consideration of candidate species in project planning. The Service will issue a listing determination for the red knot by September 30, 2013. We encourage the Corps to include red knot in the environmental review process.

Other Federally Listed or Candidate Species

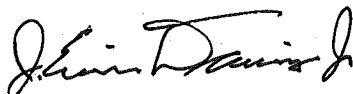
The Service provides the above information with respect to federally listed or proposed threatened or endangered flora and fauna under Service jurisdiction only. The proposed project may affect the marine environment of Little Egg Inlet. Principal responsibility for threatened and endangered marine species is vested with the National Marine Fisheries Service (NMFS). Therefore, Corps coordination with the NMFS is necessary to fulfill consultation requirements pursuant to Section 7(a)(2) of the ESA. The Corps should also contact the NMFS regarding whether the Little Egg Inlet has been designated as essential fish habitat pursuant to the Magnuson-Stevens Fisheries Conservation Act (16 U.S.C. 1801 *et seq.*)

STATE-LISTED SPECIES

The State-listed (endangered) black skimmer (*Rhynchops niger*), least tern (*Sterna antillarum*), seaside evening primrose (*Oenothera humifusa*), and seabeach milkwort (*Glaux maritima*); and the State-listed (threatened) little blue heron (*Egretta caerulea*), yellow-crowned night-heron (*Nyctanassa violacea*), and osprey (*Pandion haliaetus*) have been documented occurring within the study area. The Service recommends that you consider protection of State-listed species in project planning.

We look forward to reviewing the draft EA. If you have questions or need clarifications, please contact Carlo Popolizio at (609) 383-3938, extension 32.

Sincerely,



J. Eric Davis Jr.
Field Supervisor

cc: Todd Pover: todd.pover@conservewildlifenj.org
Virginia Rettig: Virginia_Rettig@fws.gov
Karen Greene: karen.greene@noaa.gov

ES:NJFO: CPopolizio:RP:JED:cap: 1/3/13

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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

AUG 27 2014

Mr. Eric Schradling
Field Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office, Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232

Dear Mr. Schradling:

In accordance with procedures outlined in the "Biological Opinion on the Effects of Federal Beach Nourishment Activities Along the Atlantic Coast of New Jersey Within the U.S. Army Corps of Engineers, Philadelphia District on the Piping Plover and Seabeach Amaranth", prepared by your office in December 2005, the Philadelphia District is writing to request initiation of streamlined (Tier 2) formal consultation under Section 7 of the Endangered Species Act of 1973 (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). This consultation request is in regard to concerns over potential direct, indirect and cumulative impacts to the federally threatened piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) from beach nourishment activities scheduled for the remaining unconstructed portions of the *Barnegat Inlet to Little Egg Inlet (Long Beach Island) Coastal Storm Damage Reduction* project.

In accordance with Section 102 of the National Environmental Policy Act (NEPA), a draft Environmental Assessment was provided to your office 20 November 2013 and your review comments and recommendations provided 7 January 2014 were incorporated into the final report. A follow-up letter was provided to you 5 February 2014. The project was originally authorized in 2000, and is now being funded in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on 29 January 2013 in response to the devastating coastal storm Sandy that struck the Eastern region of the United States in October 2012.

The selected plan involves the placement of beachfill sand obtained from Borrow Area D1 (a 683-acre borrow area, centered approximately 2.5 miles off Harvey Cedars in state waters) and D2: a 1034-acre area in Outer Continental Shelf (OCS) waters located directly east of Borrow Area D1. Under Public Law 103-426, enacted 31 October 1994, the District has obtained a Memorandum of Agreement with the Bureau of Ocean Energy Management (BOEM), as a cooperative agency, to utilize OCS sand resources for this project. The most recent estimates for completion of initial construction of the Long Beach Island project are approximately 3.1 million cubic yards (mcy) from Borrow Area D1 and approximately 7.0 mcy from Borrow Area D2. The sand will be placed on the beach to create a dune and beach berm of uniform cross section for the remaining

unconstructed project municipalities. The beach berm will be 125-feet wide at elevation +8.0 North American Vertical Datum (NAVD) with a dune at an elevation of +22 feet NAVD. The dune would be 30-feet wide at its crest and incorporate 347 acres of planted dune grasses and 540,000 linear feet of sand fencing (see attached plan drawings). The nonfederal sponsor, the New Jersey Department of Environmental Protection (NJDEP), recognizes the requirement for each municipality to develop a Beach Management Plan approved by the Service and the New Jersey Division of Fish & Wildlife for those towns scheduled to receive sand replenishment.

This project constitutes a Tier 2 individual project under the U.S. Fish and Wildlife Service's (Service) December 2005 Tier 1 Programmatic Biological Opinion on the effects of Federal beach nourishment, renourishment, stabilization, and restoration activities along the Atlantic Coast of New Jersey within the Philadelphia District on Federally-threatened piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). The District requests Tier 2 (streamlined) consultation for the remaining unconstructed reaches of the project from Seaview Drive, Loveladies to the terminal groin in Holgate, Long Beach Township, Ocean County, New Jersey.

Previous coordination for a Tier 1 Programmatic Biological Opinion and Tier 2 streamlined formal consultation has occurred between our offices since 1998 and as recently as August 2013 for the currently proposed use of borrow area D2. The beachfill template remains the same as that which was coordinated with your office in August 2013. The project is scheduled to be advertised for bid 8 September 2014 with a contract awarded 20 October 2014. The construction Notice to Proceed date is 3 November 2014 with a contract duration period of 15 months.

Formal consultation will be ongoing throughout the LBI project life where the USFWS requires individual Tier 2 consultation prior to construction and each periodic nourishment cycle. The Section 7 consultation process is expected to result in monitoring before, during and after construction, imposing timing restrictions if piping plover nests are found or in areas where recent nesting activities have occurred, construction of temporary protective fencing, and avoidance during the construction with buffer zones. Other issues addressed include dune fence orientation, local practices such as beach raking, off-road vehicles, permanent easements for monitoring and management activities, and general public access in or near nesting locations. The project area, specifically the foredune area, would be periodically monitored for the seabeach amaranth. Contingency plans for the presence of seabeach amaranth at the time of initial construction or periodic maintenance may involve avoidance of the area (if possible), collection of seeds to be planted in non-impacted areas, and timing restrictions.

Concerning your comments specific to piping plovers and the state-listed species of beach nesting birds (*i.e.* least tern and black skimmer), recommendations from both the Service and New Jersey's Endangered and Nongame Species Program (ENSP) are included in the project specifications. Although the likelihood of nesting activity by piping plovers, least terns or black skimmers within the project area is low, the contractor will be required to ensure that all employees are aware of the potential presence of these

species. In the event that any of these beach-nesting species are sighted in the project area between 15 March and 31 August, the contractor must ensure that a bird monitor is on-site to monitor construction activities and immediately notify the Corps. The Corps will then coordinate with both the ENSP and the Service to determine the necessary steps taken to establish sufficient fenced buffer zones between any construction activity and birds exhibiting territorial or breeding behavior. No personnel, vehicles or equipment will be permitted within the buffer zone.

In the event that piping plovers are observed nesting the project vicinity, the contractor may work greater than 1,000 meters from a known nesting area in non-nesting portions of the project after 1 July, with written concurrence from the Service and ENSP, provided no piping plover activity has been observed within the remaining construction area after 8 monitoring days over the previous 2-week period. Piping plover monitoring shall begin 15 March and continue until all chicks from adjacent nesting sites have fledged or construction-related activities have terminated.

In regard to the candidate species Red Knot (*Calidris canutus rufa*), we are aware that the species may be listed prior to completion of the project and request that you please provide conservation recommendations to be implemented prior to completion of formal consultation for the species. The District also coordinates regularly with Mr. Todd Pover of the NJDEP to determine if any listed species are observed in the proposed fill areas.

Concerning your NEPA review comments on seabeach amaranth, the Corps has coordinated with your office for New Jersey shoreline protection projects and has incorporated the following in the project specifications for this project: the contractor will take all necessary actions to ensure protection of the seabeach amaranth plant. The plant's growing season runs from May through November. The contractor will ensure that all employees are aware of the potential presence of the species and provide sufficient information describing the plant to all on-site personnel. A photograph of seabeach amaranth is included in the project specifications. The contractor must notify the Corps immediately if seabeach amaranth plants are located within the project area. Information obtained from surveys conducted by the ENSP prior to construction shall be provided to the contractor regarding the location of any seabeach amaranth plants located within the project vicinity. If any plants are found, the contractor shall be responsible for establishing a 3-meter buffer zone around any plant and construction activities must avoid any delineated areas until the plant dies back or can be relocated by the appropriate agency.

The Corps will follow any conservation measures proposed in our Biological Assessment to protect any listed species that may occur in the project area, and the reasonable and prudent measures outlined in the Service's Biological Opinion. Based on the above-mentioned information, we have concluded that the proposed beach fill plan is not likely to directly impact piping plover or seabeach amaranth through burial or habitat alteration. These impacts, including potential indirect, secondary, and cumulative impacts, have been fully covered in the Biological Opinion, and are "not likely to adversely affect" either species. Therefore, we believe that the consultation for the emergency

rehabilitation of these portions of the previously constructed project can be concluded through informal consultation.

At this time, we are requesting a written response indicating your concurrence with our proposed course of action with regard to direct and indirect impacts to these threatened species and the proposed Corps construction activities. This response will serve to conclude the Section 7 Consultation Process for this phase of Long Beach Island project. Thank you for your attention to this matter. If you have any questions or require additional information, please contact Ms. Barbara Conlin of the Environmental Resources Branch at (215) 656-6557 or Barbara.E.Conlin@USACE.army.mil.

Sincerely,

Peter R. Blum
Chief, Planning Division

Enclosure



In Reply Refer To:
14-CPA-0212

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
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Peter Blum, Chief
Planning Division
Philadelphia District
U.S. Army Corps of Engineers
100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
ATTN: Barbara Conlin

SEP 22 2014

Dear Mr. Blum:

The U.S. Fish and Wildlife Service (Service) received your August 27, 2014 request for streamlined (Tier 2) formal consultation regarding U.S. Army Corps of Engineers, Philadelphia District (Corps) proposed beach re-nourishment activities in the approved Barnegat Inlet to Little Egg Inlet, Ocean County, New Jersey Coastal Storm Damage Reduction Project. Specifically, the Corps proposes to re-nourish beaches from Seaview Drive in Loveladies to the terminal groin in Holgate, Long Beach Township.

This response serves as Tier 2 streamlined consultation pursuant to the Service's December 2005 Programmatic (Tier 1) Biological Opinion on the Effects of Federal Beach Nourishment, Re-nourishment, Stabilization, and Restoration Activities along the Atlantic Coast of New Jersey within the Corps, Philadelphia District on the Federally Listed (threatened) Piping Plover (*Charadrius melodus*) and Seabeach Amaranth (*Amaranthus pumilus*) (PBO). This Tier 2 (streamlined) consultation covers only the subject re-nourishment event, including potential direct and indirect effects to federally listed species that may occur during and after construction. Subsequent re-nourishment events will be considered separate Federal actions and will require individual Tier 2 consultations.

AUTHORITY

This response is provided pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of endangered and threatened species and does not address all Service concerns for fish and wildlife resources. These comments do not preclude separate review and comment by the Service directed to the Corps via the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) for any permits required pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344 *et seq.*); or

comments on any forthcoming environmental documents pursuant to the National Environmental Policy Act of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321 *et seq.*).

CONSULTATION HISTORY

A chronology of key correspondences among the Service, Corps, and New Jersey Department of Environmental Protection – Endangered and Nongame Species Program (ENSP) regarding the subject project is provided below.

- November 20, 2013 The Corps provided a draft Environmental Assessment (draft EA) to the Service in accordance with Section 102 of the National Environmental Policy Act.
- January 7, 2014 The Service provided a letter with comments and recommendations regarding the draft EA to the Corps.
- February 8, 2014 The Corps provided a follow-up letter to the Service addressing our comments and recommendations on the draft EA.
- July 22, 2014 Mr. Todd Pover with the Conserve Wildlife Foundation (CWFNJ - representing the ENSP) provided a beach nesting bird update to the Corps and the Service.
- July 28, 2014 The Corps provided the project schedule to the Service.

PROJECT DESCRIPTION

The project would entail re-nourishing all municipalities from Seaview Drive in Loveladies to the terminal groin in Holgate. A maximum of 3,100,000 cubic yards of sand is proposed to be placed on the subject beaches from the approved offshore borrow area D1 in front of Harvey Cedars and 7,000,000 cubic yards of sand from D2, which is located east of D1 within the Outer Continental Shelf. The beach berm will be 125-feet wide and the berm profile will be returned to the +8.0 feet NAVD design criteria, with a 30-foot-wide dune crest at elevation +22 feet NAVD. The Corps proposes to begin construction on November 3, 2014 and complete the project within 15 months.

ADHERENCE TO MEASURES TO MINIMIZE IMPACTS TO FEDERALLY LISTED SPECIES

Relevant conservation measures proposed by the Corps for protection of federally listed species, and reasonable and prudent measures (RPMs) imposed by the Service to minimize take of federally listed species, are specified within the PBO and are applicable to all Tier 2 projects carried out under the Corps' program. All applicable measures to protect piping plovers will be followed during the subject 2014 re-nourishment:

- The beach nourishments will be conducted within the piping plover nesting season. No nesting has occurred in the proposed fill area in the last 10 years. With a proposed starting date of November 3, 2014, the Corps will be unable to obtain year 2015 nesting data from Mr. Todd Pover prior to project implementation. The Corps will abide by all RPMs specified in the PBO and in the Corps letter dated August 27, 2014 in the event plovers are found nesting within or near the project area.
- The Corps will notify the Service, ENSP, and CWFNJ of the precise starting date, if the project will be modified, and end date as it approaches completion.
- There has been one known occurrence of seabeach amaranth (two plants in 2002) in the proposed areas to be re-nourished, specifically between North Beach and Frazer Park. Preliminary data collected in 2014 indicate that no plants were found within the project area.

The red knot (*Calidris canutus rufa*) (proposed for listing) may be listed as threatened under the ESA in the near future. Small numbers of red knots may occur in New Jersey year-round, while large numbers of birds rely on stopover habitats along the Atlantic Coast during the fall (late-July through October) migration period. In response to the Corps request for conservation measures for the red knot, the project area is not known to provide habitat for large concentrations of red knots. While conservation measures for this species may not be warranted, please contact the Service if flocks of red knots are sighted during project activities within the subject area.

STATUS OF THE SPECIES

Relevant biological and ecological information for the piping plover and seabeach amaranth was provided to the Corps in the PBO. That information remains pertinent and was considered by the Service in formulating this Tier 2 Biological Opinion.

ENVIRONMENTAL BASELINE

The environmental baseline for the Corps' overall program for Federal beach nourishment, re-nourishment, stabilization, and restoration activities along the Atlantic Coast of New Jersey within the Philadelphia District was established and fully described within the PBO. New information regarding the status of the piping plover and seabeach amaranth within the project area since issuance of the PBO has become available. Specifically, no piping plovers have nested within the proposed re-nourishment areas in the last 10 years, and no seabeach amaranth plants were found since 2002. All other information described within the PBO remains pertinent and was considered by the Service in formulating this Tier 2 Biological Opinion.

EFFECTS OF THE ACTION

Following review of the information provided by the Corps regarding the subject nourishment project, the Service has determined that the potential effects of the project are consistent with those addressed in the PBO and are hereby incorporated by reference. Beach habitats within the

project area have been degraded by beach erosion, and no piping plover or seabeach amaranth were present within the project area in the past ten years.

The proposed re-nourishment area does not presently provide suitable piping plover nesting habitat. Therefore, no direct adverse impacts to these species are anticipated unless plovers occupy the project area during the 2015 or subsequent nesting seasons.

Following beach nourishment in other areas of New Jersey, piping plovers have established nesting in previously unoccupied sites, and seabeach amaranth has colonized suitable habitats created by beach re-nourishment. However, piping plover nesting and productivity on such stabilized beaches (where no habitat enhancement occurs) is generally lower than on un-stabilized beaches where over-wash zones and or tidal pools are available. Therefore, it is likely that at least one pair of piping plovers may nest or attempt to nest within the subject project area following the fill, and productivity is anticipated to be lower than on un-stabilized beaches or stabilized beaches with habitat enhancement.

CONCLUSION

Actions and effects associated with the subject re-nourishment project are consistent with those identified and discussed within the PBO. After reviewing the size and scope of the project, the environmental baseline, the status of federally listed species within the project area, and the effects of the action, it is the Service's Biological Opinion that the 2014-15 re-nourishment project from Seaview Drive in Loveladies to the terminal groin in Holgate, Long Beach Township is not likely to jeopardize the continued existence of the piping plover or seabeach amaranth. No Critical Habitat has been designated for these species within the project area; therefore, no Critical Habitat will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and the Federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in the death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of carrying out an otherwise lawful activity.

Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered a prohibited taking under the ESA, provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement. The type and amount of anticipated incidental take is consistent with that described in the PBO and does not cause a level of incidental take in the PBO.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

To be exempt from the take prohibitions of Section 9 of the ESA, the Corps must implement all RPMs and terms and conditions, as stipulated in the PBO, to minimize the impact of anticipated incidental take of plovers. The Service has determined that the following new reasonable and prudent measures beyond those specified in the December 2005 Tier I Programmatic Biological Opinion are needed to minimize the impact of incidental take anticipated for the Long Beach Township, Ship Bottom Borough, and Beach Haven Borough re-nourishment project:

- The Corps will abide by all RPMs specified in the PBO and in the Corps letter dated August 27, 2014 in the event plovers are found nesting within or near the project area.

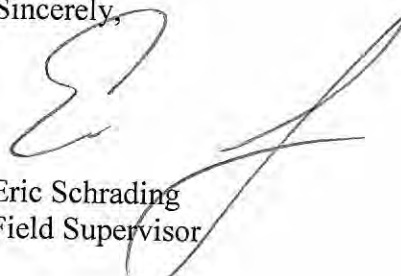
The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps: (1) fails to demonstrate clear compliance with the RPMs and their implementing terms and conditions in this Biological Opinion; or (2) fails to require Corps staff, contractors, cooperators, and/or permittees to adhere to the terms and conditions of the incidental take statement; and/or (3) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) of the ESA may lapse.

REINITIATION - CLOSING STATEMENT

This concludes Tier 2 formal consultation on the effects of the Corps' proposed 2014-15 beach re-nourishment from Seaview Drive in Loveladies to the terminal groin in Holgate, Long Beach Township, Ocean County, New Jersey. As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or Critical Habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or Critical Habitat that was not considered in this opinion; or, (4) a new species is listed or Critical Habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

Please contact Carlo Popolizio at (609) 383-3938, extension 32, if you have any questions or require further assistance regarding threatened or endangered species.

Sincerely,



Eric Schrading
Field Supervisor

cc: todd.pover@conservewildlifenj.org
Virginia_Rettig@fws.gov
Dave.Jenkins@dep.nj.gov

ES:NJFO:Cpopolizio:RP:ES: 9/11/14
P:/Shared/Carlo/14-CPA0212 [Tier 2 LBI]



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

APR - 4 2013

Minas M. Arabatzis, Chief
Planning Division
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

ATTN: Barbara Conlin, Project Biologist
RE: Proposed Sand Borrow Area in Little Egg Harbor Inlet
Ocean and Atlantic Counties, New Jersey

Dear Mr. Arabatzis:

We have received your letter dated December 20, 2012, concerning the Army Corps of Engineers (Corps) proposal to designate a sand borrow area within the Little Egg Harbor Inlet as a supplemental sand source for beach nourishment along a 17-mile stretch of Long Beach Island, New Jersey between the Barnegat Inlet and Little Egg Harbor Inlet. Beach nourishment along this section of New Jersey's coast was evaluated originally in 1999 under the New Jersey Shore Protection Study's Final Feasibility Report and Integrated Environmental Impact Statement. The borrow area identified in that study, known as D1 is located approximately 2.5 miles offshore of Harvey Cedars, NJ. According to your letter, this current area does not have sufficient quantities to complete the project without imposing adverse environmental impacts to the marine environment with deeper cuts into the borrow area. As a result, the Corps will be preparing an environmental assessment (EA) to gather and evaluate additional data for the proposed plan to establish a new borrow area within the Little Egg Harbor Inlet.

The coastal waters and inlets of New Jersey provide habitat for a wide variety of NOAA trust resources including federally managed species; shellfish and crustaceans, migratory species, federally protected fish, sea turtles and marine mammals and many others. Inlets, such as the Little Egg Harbor Inlet provide a critical link between the Atlantic Ocean and the spawning, nursery and forage grounds in the estuaries and rivers. To assist you in the development of a draft EA to assess the impacts of the designation and use of a new borrow area in the inlet, we offer the following technical assistance and preliminary comments.

Magnuson-Stevens Act

The Little Egg Harbor Inlet has been designated as essential fish habitat (EFH) for a variety of life stages of fish managed under the New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, the South Atlantic Fishery Management Council and National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service



(NMFS). Species for which EFH has been designated includes: Atlantic butterfish (*Peprilus triacanthus*), Atlantic cod (*Gadus morhua*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), cobia (*Rachycentron canadum*), king mackerel (*Scomberomorus cavalla*), monkfish (*Lophius americanus*), red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*), Spanish mackerel (*Scomberomorus maculatus*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), winter skate (*Leucoraja ocellata*), little skate (*Leucoraja erinacea*), and clearnose skate (*Raja eglanteria*).

EFH for highly migratory species designated in the area includes: bluefin tuna (*Thunnus thynnus*), dusky shark (*Carcharhinus obscurus*), sandbar shark (*Carcharhinus plumbeus*), sand tiger shark (*Odontaspis taurus*), scalloped hammerhead shark (*Sphyrna lewini*), smooth dogfish (*Mustelus canis*), and tiger shark (*Galeocerdo cuvieri*). Sand tiger and dusky sharks have been listed as Species of Concern by NOAA. Species of Concern are those species about which we have concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act. In addition, the mouth of Little Egg Harbor Inlet and Great Bay has been designated as a Habitat Area of Particular Concern (HAPC) for sandbar shark. Habitat Areas of Particular Concern (HAPC) are discrete subsets of EFH that provide important ecological functions and/or are especially vulnerable to degradation. In this case, the Little Egg Harbor Inlet and Great Bay are important pupping and nursery grounds for sandbar shark.

The Magnuson-Stevens Act requires federal agencies to consult with the Secretary of Commerce, through us, with respect to “any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat (EFH) identified under this Act.” The EFH final rule published in the Federal Register on January 17, 2002 defines an adverse effect as: “any impact which reduces the quality and/or quantity of EFH.” The rule further states that:

An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

As part of the draft EA, you should prepare an EFH assessment to address the direct, indirect, individual and cumulative effects of the designation and use of the proposed borrow area on EFH and federally managed species and their prey. The EFH final rule states that the loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat and the definition of EFH includes waters and substrate necessary to fish for feeding. Therefore, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species habitat, may also be considered adverse effects on EFH.

Fish and Wildlife Coordination Act

A wide variety species under the stewardship of NOAA transit the Little Egg Harbor Inlet to access the Great Bay and its tributaries for spawning, nursery and forage habitat or use the Great Bay estuarine complex to complete all or part of their life cycle. These species include both state and federally managed species and their forage, notably bluefish, summer flounder, scup, black sea bass, butterfish, winter flounder, weakfish (*Cyanoscion regalis*), striped bass (*Morone saxatilis*), tautog (*Tautoga onitis*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), killifish (*Fundulus spp.*), Atlantic silversides (*Menidia menidia*), bay anchovies (*Anchoa mitchilli*) and other assorted baitfishes and shrimps (e.g., *Neomysis americana*, *Mysidopsis bigelowi*).

Diadromous species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass and American eel (*Anguilla rostrata*) transit the inlet to reach freshwater tributaries for spawning or growth to maturity. Buckel and Conover (1997) in Fahey et al. (1999) reports that diet items of juvenile bluefish include *Alosa* species such as these. Juvenile *Alosa* species have all been identified as prey species for windowpane flounder (*Scophthalmus aquosus*) and summer flounder (*Paralichthys dentatus*) in Steimle et al. (2000).

Alewife and blueback herring were designated as candidate species for listing under the Endangered Species Act (ESA) in 2011. Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which we have initiated an ESA status review and have announced that review in the Federal Register. More information on these species and the Candidate Species program can be found at: <http://www.nmfs.noaa.gov/pr/species/esa/other.htm>.

Adult female blue crabs overwinter at the mouths of New Jersey inlets in the winter, generally December through March, so they are in position to release their eggs in spring in a location that will allow their eggs to be carried into the ocean. The crabs burrow into surficial sediments as water temperature declines and overwinter in a dormant, immobile state until water temperature rise above approximately 10 degrees C in the spring. Steimle et al. (2000) has documented that juvenile blue crabs are a food source for several state and federally managed fish species including winter flounder, little skate, winter skate, scup, and summer flounder.

Endangered Species Act

Section 7 of the Endangered Species Act (16 U.S.C. § 1536(a)(2)) requires Federal agencies to consult with the Secretary of Commerce, through NOAA, to insure that “any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or adversely modify or destroy [designated] critical habitat . . .” See also 50 C.F.R. part 402. The following ESA listed species under our jurisdiction are likely to occur in the waters off New Jersey:

Sea Turtles

Several species of federally listed threatened or endangered species under our jurisdiction are known to occur in the vicinity of the proposed project area. Listed sea turtles are found seasonally in the waters off of New Jersey, typically between April and November. The species that are likely to be present include: the federally threatened Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead (*Caretta caretta*) sea turtles, as well as the federally endangered Kemp's ridley (*Lepidochelys kempi*), leatherback (*Dermochelys coriacea*) and green (*Chelonia mydas*) sea turtles.

Cetaceans

The federally endangered North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), and humpback whales (*Megaptera novaeangliae*) are found in the waters off of New Jersey. North Atlantic right whales are known to use the nearshore, coastal waters of the Atlantic Ocean as a migration route to and from calving grounds throughout the year. Within the waters of the proposed Little Egg Inlet borrow area, North Atlantic right whales are likely to occur primarily between November 1 through April 30¹. Humpback whales feed during the spring, summer, and fall over a range that encompasses the eastern coast of the United States, while fin whales may be present off the coast of New Jersey year round. Sei (*Balaenoptera borealis*) and sperm (*Physter macrocephalus*) whales may also be present in the deeper offshore waters of New Jersey, and therefore, are not expected to occur in the project area.

Atlantic Sturgeon

There are five DPSs of Atlantic sturgeon listed as threatened or endangered. Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs are listed as endangered, while the Gulf of Maine DPS is listed as threatened (77 FR 5880; 77 FR 5914; February 6, 2012). The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida.

Atlantic sturgeon are known to occur within the nearshore, coastal waters of the Atlantic Ocean, primarily using these bodies of water throughout the year as a migratory pathway to and from spawning, overwintering, and/or foraging grounds throughout their range. Young remain in their natal river/estuary until approximately age 2 (length of 30-36 inches) before emigrating to open ocean as subadults (Holland and Yelverton 1973; Dovel and Berggen 1983; Dadswell 2006; ASSRT 2007). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, typically in waters between 5 to 50 meters in depth, using coastal bays, sounds, and ocean waters (Vladykov and Greeley 1963; Murawski and Pacheco 1977; Dovel and Berggren 1983; Smith 1985; Collins and Smith 1997; Welsh *et al.* 2002; Savoy and Pacileo 2003; Stein *et al.* 2004; Laney *et al.* 2007; Dunton *et al.* 2010; Erickson *et al.* 2011). As early life stages (e.g., eggs, larvae, young of the year), remain in their natal river/estuary, only subadult and adult Atlantic sturgeon will be found in the nearshore coastal

¹ From November 1 through April 30, a Seasonal Management Area (SMA) has been designated in the waters within, and near the entrance to the Delaware Bay. The proposed Little Egg Inlet borrow area is located in close proximity to this SMA and thus, compliance with the NMFS Ship Strike Reduction Rule is strongly recommended (see 50 CFR 224.105).

waters of New Jersey, and thus, within the waters of the proposed Little Egg Inlet borrow area.

ESA Consultation

As ESA listed species of sea turtles, whales, and Atlantic sturgeon are known to occur in the waters off New Jersey, the designation and use of the proposed borrow area has the potential to affect these species, and thus, section 7 coordination will be necessary. To assist in our review of the proposed action, your EA will need to provide a detailed description of the proposed action, as well as, consider the direct, indirect, individual and cumulative effects of the designation and use of the proposed borrow area on these species. In addition, prior to any initiation of consultation, we would like to coordinate with you to discuss the proposed action and the best pathway forward for consultation. Should you have any questions regarding these comments, the section 7 process, or future section 7 coordination, please contact Danielle Palmer of my staff at (978)282-8468 or danielle.palmer@noaa.gov.

We look forward to additional coordination on this and other beach nourishment projects in the coming months. We would like to begin discussions with you and your staff on how to best coordinate on the many projects likely to be constructed as a result of superstorm Sandy so that the required consultations can be completed in the most efficient and expeditious manner. If you need additional information or would like to discuss this matter further or arrange a conference call to begin discussions of the larger beach nourishment and borrow area issues, please contact Karen Greene at 732 872-3023 or 978 317-5107, or Danielle Palmer at 978 282-8468 for Section 7 questions.

Sincerely,



Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

FEB 29 2016

Peter Blum
Chief, Planning Division
Philadelphia District, Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelphia, PA 19107-3390

RE: Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey

Dear Mr. Blum:

The Environmental Protection Agency (EPA) has reviewed the U.S. Army Corps of Engineers (Corps) draft environmental assessment for the Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project located in Ocean County, New Jersey. This environmental assessment tiers off the Philadelphia District's Final Feasibility Report and Integrated Environmental Impact Statement for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) reach of the New Jersey Atlantic Ocean Coastline (1999), and several subsequent environmental assessments prepared under the National Environmental Policy Act. To continue beach renourishment as the most effective way to address coastal erosion along the Atlantic Ocean side of Long Beach Island, as determined in those documents, this environmental assessment evaluates the plan to obtain sand fill from the Little Egg Inlet borrow area to meet this requirement and future periodic nourishments.

EPA finds that the EA supports a finding of no significant impact. However, EPA reminds the Corps that all construction emissions for this project, as determined in the emissions inventory developed in the Final Environmental Assessment, Barnegat Inlet to Little Egg Inlet (Long Beach Island, New Jersey Storm Damage Reduction Project, 2014, must be offset if they are above the de minimus levels set forth under the General Conformity Rule. (Clean Air Act Section 176 (c) (4))

Also, EPA encourages the Corps to incorporate the effects of greenhouse gas (GHG) emissions and climate change in its NEPA review process. In this case, we suggest that the Little Egg Inlet Sand Resource Borrow Area Investigation, and any subsequent documents for the Barnegat Inlet to Little Egg Inlet Reach consider GHG emissions that would result from construction associated with fill or beach stabilization. Such valuation may be used as the proxy for assessing a proposed action's potential climate change impacts. EPA recommends that the draft environmental assessment also include an analysis of practicable mitigation measures to reduce

GHG emissions. Example tools for estimating and quantifying GHG emissions can be found on CEQ's https://ceq.doe.gov/current_developments/GHG_accounting_methods_7Jan2015.html. Recognizing that climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, we do not recommend comparing GHG emissions from the proposed action to global emissions or total U.S. emissions, as this approach is limited by the cumulative nature of GHG concentrations and the impacts of climate change.

Thank you for the opportunity to comment. If you have any questions, please call Lingard Knutson of my staff at (212) 637-3747.

Sincerely,

A handwritten signature in cursive script, appearing to read "Grace Musumeci", with a long horizontal flourish extending to the right.

Grace Musumeci, Chief
Environmental Review Section

-----Original Message-----

From: Popolizio, Carlo [mailto:carlo_popolizio@fws.gov]

Sent: Thursday, March 10, 2016 8:50 AM

To: Conlin, Barbara E NAP <Barbara.E.Conlin@usace.army.mil>; Eric Schradling <eric_schradling@fws.gov>; Virginia Rettig <virginia_rettig@fws.gov>

Subject: [EXTERNAL] USGS review or the ERDC model

Good morning Barbara,

please find the USGS review of the ERDC model attached to this e-mail. The comments from USGS should be incorporated into any EA revisions as well as any additional modelling the Corps implements.

We will be providing additional comments to the draft EA. Additional consultation under ESA will be necessary.

Thanks, Carlo

--

New address as of November 1, 2015:

Carlo Popolizio, Biologist

U.S. Fish and Wildlife Service

New Jersey Field Office

4 East Jimmie Leeds Road, Unit 4

Galloway, New Jersey 08205-4465

Phone (609) 382-5271

Fax (609) 646-0352

The warbling of birds and the grandeur and the beauties of the forest, the majestic clouds, the golden tints of a summer evening sky, and all the changes of nature combine to furnish ample matter for reflection to the contemplating youth.

Francis Assikinack (Blackbird) Ottawa



United States Department of the Interior

U. S. GEOLOGICAL SURVEY
384 Woods Hole Road
Woods Hole, MA 02543
508-457-2211 (voice) 508-457-2310 (fax)

March 4, 2016

Virginia Rettig, Refuge Manager
U.S. Fish and Wildlife Service
Edwin B. Forsythe National Wildlife Refuge
Oceanville, NJ 08231

Dear Ms. Rettig,

Thank you for providing the U.S. Geological Survey (USGS) with the opportunity to comment on the Army Corps of Engineers report entitled "Borrow Area Analysis at Little Egg Inlet, New Jersey". A team of geoscientists from the USGS conducted a thorough review of the document, and found that while the methods appear internally consistent, the validity of many of the model assumptions are not tested. There also appeared to be limited testing of model sensitivity to these assumptions, which would likely change the outcome of the results. In this review, we include an overview of our major findings, deficiencies, observations, and recommendations.

Thank you again for the opportunity to provide input on this important document. We look forward to further collaboration between our agencies.

Sincerely,

Walter Barnhardt, Director
USGS Woods Hole Coastal and Marine Science Center
Woods Hole, MA 02543

USGS evaluation of Frey et al., “Borrow Area Analysis at Little Egg Inlet, New Jersey”

N.K. Ganju¹, P.S. Dalyander², J.H. List¹, and N.G. Plant²

¹Woods Hole Coastal and Marine Science Center

²St. Petersburg Coastal and Marine Science Center

Summary

We have reviewed the methods, results, and conclusions of the USACE report entitled “Borrow Area Analysis at Little Egg Inlet, New Jersey”. The report presents the results of two modeling components used to quantify the likely impacts of dredging scenarios: (1) STWAVE to estimate the changes in wave energy distribution, and (2) GenCade to estimate likely impacts of the dredging on shoreline change. Because wave model output are provided to GenCade seaward of the proposed dredging sites, the longshore transport rates in GenCade do not change in the model in response to alterations to the bathymetry as they would in the real system, and the impacts to waves and shoreline change are therefore considered independently in the report. The report’s abstract summarizes the study approach and presents three major statements based on the study. These statements are (1) a primary **result** that dredging would cause less than a 10% change to the average wave energy in the inlet region; (2) an **assumption** that large volumes of sand move into the inlet; and (3) a primary **conclusion** that dredging would not significantly impact the shoreline in the inlet vicinity.

In response to the final FWS comment (“Response to Planning Aid Report Comments”, pg. 3) concerning impacts to the wilderness area: the most likely impact of removing significant volumes of sand from the Little Egg Inlet ebb-tidal delta will be erosion of the down-drift beach, which is part of the wilderness area. There is evidence, in the form of inlet bypassing bars which are welding onto the south beach, that the volume of sediment in the ebb-tidal delta complex is in equilibrium with the tidal prism, and when averaged over the long-term, the amount of sediment bypassing the inlet to nourish the down-drift beach is likely to be similar to what is entering via alongshore transport from the north. If part of the ebb-tidal delta is removed, the inlet bypassing will be reduced until the ebb-tidal delta volume is again at an equilibrium volume, with the sediment delivered by the long-term net alongshore transport towards the south. It cannot be assumed that there will be an accelerated rate of sediment delivery to the inlet because the beach 2.5 miles (and farther) updrift of the inlet has been renourished (having to do with the “source term” – see below).

The abstract states that the modeling efforts did not yield significant impacts for any of the scenarios modeled for this study. It is unclear what criteria are used to determine whether an impact is significant or insignificant. If a 10% change in wave energy, a key result, is considered insignificant, there needs to be some quantification of what this change means for alongshore transport gradients and/or shoreline change. It is possible that a small but persistent impact on the wave field over the shoal could lead to a significant impact to the inlet and shoreline over the longer time intervals considered by this study. This effect could have been evaluated, if the study had explicitly considered the influence of wave transformation over the modified shoal on alongshore sediment flux or shoreline change. However, STWAVE model output was extracted from points seaward of the ebb shoal, so wave transformation over the shoal and borrow pit are not considered in the modeling.

GenCade numerical modeling results showed that as long as large volumes of sand move into Little Egg Inlet area from Long Beach Island to the north, the potential dredging scenarios will not significantly impact the adjacent shorelines. This result is dependent on the assumption of a “source term,” an additional sand source that is added to specific segments of the shoreline, or to the entire modeling domain (Table 7), following the renourishment of Long Beach Island. The justification for adding this source term appears to be that the renourishment will accelerate the delivery of sand to the south. However, the GENESIS model part of GenCade should already predict the alongshore transport rate and delivery of sand to Little Egg Inlet, both before and after the beach renourishment. The processes by which this transport would be accelerated following renourishment, and why GENESIS is unable to model this increase, are not explained. Without the addition of a source term, the GenCade results do predict downdrift beach erosion, which is consistent with the inlet equilibrium concept, as described above (Fig. 38, no source case).

Finally, the study concludes that neither the wave energy impacts nor the sediment redistributions associated with any of the dredging alternatives would have a significant impact. The model framework relies on the previously mentioned simplification of considering wave impacts and shoreline change independently; an assumption regarding sand transport from another nourishment projects; and calibration factors (such as shoal volumes) that had to be tuned rather than independently calculated. There should be clear metrics for determining significance that encompasses the simultaneous response of the waves to a borrow sites, the interaction of this wave response on sediment transport near the shoreline, and the shoreline response. The impact of key assumptions and calibration factors on these metrics should also be explicitly considered. Additional model evaluation, requiring observations of actual sediment source behavior, is required to assess the validity of the sediment source assumptions. Additional model sensitivity studies could also evaluate the likelihood of finding a significant impact (once significance is defined) given uncertainty in the GenCade calibration parameters.

Additional specific issues

Nearshore wave modeling

The Little Egg Inlet (LEI) NAP grid appears to be forced on the offshore boundary. It should probably be nested within the NACCS grid. If not nested, swell from directions that are not normal to the offshore boundary will likely underestimated due to shadowing and this will decrease the sensitivity of the domain to modifications.

The wave model validation section refers to the NACCS validation from a separate study. Because of the point mentioned above, that validation may not be applicable to the LEI simulations. Then, because the LEI simulations focus on impacts over the shoal and in the inlet, new data are probably required to evaluate the performance where it matters for this study.

Vegetated shorelines

A 10% increase in wave energy density along vegetated estuarine shorelines (such as that near the Tuckerton Field Station 39.51 N, -74.31 W) will likely lead to a linear increase in erosion (Leonardi et al., 2016). In fact, this is one of the most rapidly eroding shorelines in Barnegat Bay, and this modeling indicates that at least a few of the scenarios lead to increased wave energy density at that location (e.g. Fig. 11, 15, 16).

Shoreline-change modeling

The wave input is taken from stations offshore of the borrow area, so the modeling study did not account for the changes in the shoal due to dredging that were modeled with STWAVE. That is, there was no explicit wave transformation over shoal to feed in to shoreline change modeling.

The “regional shoreline contour” seems to predispose the model to recreate the historic shoreline change. We believe that this approach is intended to represent very long-term sediment transport processes that affect large-scale shoreline curvature that may not be resolved by GenCade. The “regional contour” was taken as the average of three shorelines, 2002, 2007, and 2012 and this regional shoreline will be approximately equal to the 2007 shoreline and on any section of coast with a long-term trend in shoreline position from 2002 to 2012. A simulation from 2002 to 2007 that requires a return to the regional contour, as appears to be the case with GenCade, will necessarily resemble the 2007 shoreline. GenCade may be overtuned to predict the 2007 shoreline and the similarity between observed and modeled shoreline change in Fig. 20 may reflect overtuning rather than providing evidence of model skill.

Inlet flow dynamics

The analysis does not consider changes to inlet cross-sectional area and friction, and how that will affect flows in/out of Great Bay. For instance, changes in tidal dynamics due to dredging could affect salinity in the Great Bay/Mullica River system. This effect can be quantified with one-dimensional classical estuarine models.

References

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March 21, 2016

Keith Watson, Senior Project Manager
U.S. Army Engineer Corps of Engineers, Philadelphia District (NAP)
100 East Penn Square, Philadelphia, PA 19107

Dear Mr. Watson,

Thank you for providing the U.S. Army Engineer Research and Development Center (ERDC) Coastal and Hydraulics Laboratory (CHL) the opportunity to respond to the U.S. Geological Survey (USGS) evaluation of the draft report entitled "Borrow Area Analysis at Little Egg Inlet, New Jersey." The report co-authors at ERDC-CHL have provided the comments contained herein. While it has been noted that the team of geoscientists from the USGS conducted a thorough review of the document, we include relevant information here related to our study at Little Egg Inlet, New Jersey.

Thank you again for the opportunity to provide input on this important document. We look forward to further collaboration between our agencies.

Sincerely,

Alison Sleath Grzegorzewski

Research Hydraulic Engineer
U.S. Army Engineer Research and Development Center (ERDC)
Coastal and Hydraulics Laboratory (CHL)



**Response to USGS evaluation of the draft report titled
“Borrow Area Analysis at Little Egg Inlet, New Jersey” by Ashley Frey,
PE; Alison Sleath Grzegorzewski; and Bradley Johnson, PhD at the U.S.
Army Engineer Research and Development Center (ERDC)
Coastal and Hydraulics Laboratory (CHL)**

USGS Comment: “...found that while the methods appear internally consistent, the validity of many of the model assumptions were not tested. There also appeared to be limited testing of model sensitivity to these assumptions, which would likely change the outcome...”

ERDC-CHL Response: The model did not undergo extensive sensitivity and/or model assumptions testing for this study, mainly due to the time constraints associated with this particular study. To specifically address the comment on sensitivity testing, basic sensitivity testing was indeed conducted with a straight shoreline and idealized waves. The coefficients, K1 and K2, which are the main parameters that are adjusted during calibration, were tested. K1 impacts shoreline change and longshore transport along the entire domain while adjustments to K2 are seen near structures. The Little Egg Inlet study did not include structures; therefore, adjusting K2 made very little impact. Changes to K1 can significantly affect results, but that is the purpose of this particular parameter. The adjustment of other parameters, like depth of closure, berm height, and grain size, result in less significant impacts on the calculated shorelines and transport rates compared to adjusting K1. The reason these parameters might be adjusted during calibration is because it is possible that these parameters may vary along the domain. These parameters cannot be adjusted along the domain in GenCade, so some level of calibration might be necessary to determine the most representative depth of closure, berm height, and grain size along the entire domain. It is unlikely that the depth of closure or berm height would be adjusted more than a couple of feet or that the grain size would be changed by more than 0.05 mm during this process. Minor changes to these parameters do not make a significant impact on the calculated shoreline and transport rates.

USGS Comment: “Because wave model output are provided to GenCade seaward of the proposed dredging sites, the longshore transport rates in GenCade do not change in the model in response to alterations to the bathymetry as they would in the real system, and the impacts to waves and shoreline change are therefore considered independently in this report.”

ERDC-CHL Response: The USGS interpretation of the GenCade model is correct. Because the adjustments to the borrow areas in STWAVE were landward of the save stations, any modification would not impact the waves at the save station. Therefore, it was decided to use the same waves for all of the dredging alternatives. Within the Inlet Reservoir Model (IRM) within GenCade, a user can specify a dredging removal volume for a shoal within the inlet. Therefore, the volumes of the dredging events were indeed included within the GenCade model. However, as USGS indicated, alterations to the bathymetry were not included.

USGS Comment: “It cannot be assumed that there will be an accelerated rate of sediment delivery to the inlet because the beach 2.5 miles (and farther) updrift of the inlet has been renourished (having to do with “source term” see below).”

ERDC-CHL Response: The GenCade grid domain did not extend to the location of the beach nourishment activities. The source term was added to the GenCade model to account for the impacts of these beach nourishments. While it is not known for certain if additional sediment will be delivered to the inlet due to renourishment activities, it is a very reasonable assumption. When a large volume of sand is placed on a beach, it will disperse over time. In this case, transport is predominately to the south. Over time, this sand will eventually move south towards the inlet.

USGS Comment: “The justification for adding this source term appears to be that the renourishment will accelerate the delivery of sand to the south. However, the GENESIS model part of GenCade should already predict the alongshore transport rate and delivery of sand to Little Egg Inlet, both before and after the beach nourishment. The processes by which this transport would be accelerated following the renourishment, and why GENESIS is unable to model this increase, are not explained. Without the addition of a source term, the GenCade results do predict downdrift beach erosion, which is consistent with the inlet equilibrium concept, as described above.”

ERDC-CHL Response: GenCade has all of the features and capabilities of GENESIS, the model cited by the USGS reviewers. The main differences between GenCade and GENESIS are that GenCade includes inlet features and has a more user-friendly interface than GENESIS. There are other minor differences as well, but they do not impact the way the model was applied during this study. Yes, GenCade does predict longshore transport of sand. However, the GenCade domain does not include the locations to the north of Little Egg Inlet that have been nourished. GenCade is a one-line model, and GenCade assumes that the beach (berm height and depth of closure) are the same within and outside of the model domain. Therefore, if there is a beach fill directly adjacent to the GenCade grid, the model would not “know” that a

beach fill exists. A source term is the only way to include a beach fill that is not included in the domain. Adding a source term to represent a beach fill is a standard modeling practice.

USGS Comment: “Additional model sensitivity studies could also evaluate the likelihood of finding a significant impact (once significance is defined) given uncertainty in the GenCade calibration parameters.”

ERDC-CHL Response: Basic sensitivity testing of the model (idealized case) has been done. K1 and K2 are longshore transport calibration coefficients. These coefficients are meant to be adjusted during the calibration process based on how well the model reproduces measured shorelines and transport rates. The other parameters were based on measurements and/or other data. The only parameters adjusted (other than K1 and K2) during the calibration process for this study were the shoal volumes, based on data availability and reasonable engineering judgment. Due to the uncertainty in the initial shoal volumes due to lack of data, it was decided that these values would be adjusted during the calibration process. It should be noted that K1 and K2 were calibrated first. The shoal volumes were adjusted at the end of the calibration process to improve the calculated shoreline position in the proximity of the inlet. This adjustment did not impact shoreline change and sand transport along most of the GenCade domain.

USGS Comment: “The wave input is taken from stations offshore of the borrow area, so the modeling study did not account for the changes in the shoal due to dredging that were modeled with STWAVE. That is, there was no explicit wave transformation over shoal to feed in to the shoreline change modeling.”

ERDC-CHL Response: Based on our experiences, a borrow area landward of wave breaking has not been addressed with GenCade before. However, GenCade has been used in the past to model dredging scenarios. GenCade was used to model several dredging alternatives at St. Augustine Inlet in Florida (Beck and Legault 2012). An external wave model like STWAVE was not used for this study because all dredging alternatives occurred within the inlet (landward of breaking). Rather, the dredge volumes were incorporated through the Inlet Reservoir Model (IRM). For another study at Beaufort Inlet in North Carolina, the external wave model, CMS-Wave, was used to provide wave input for GenCade because an internal wave model did not predict a known reversal in transport. In addition, there have been several GENESIS (the predecessor to GenCade) studies which involved borrow areas seaward of breaking including at Ship Island, MS; Nags Head, VA; and Dare County, NC.

USGS Comment: “The regional shoreline contour seems to predispose the model to recreate the historic shoreline change.”

ERDC-CHL Response: The purpose of the GenCade regional contour is to maintain the desired overall shoreline curvature. The regional contour should incorporate large-scale trends in shoreline shape, and not small-scale features that are expected to change at time scales modeled by GenCade. For that reason, all shorelines were smoothed and small-scale features were removed. While averaging the 2002, 2007, and 2012 shorelines might cause the regional contour to be similar to the 2007 shoreline, it is only used to keep the large-scale trends along the shoreline. If the GenCade model was run for many, many years and no regional contour was used, the shoreline would evolve to a straight line. If a regional contour was used in the same situation, the shoreline would evolve to the regional contour. For this particular GenCade application, the reasoning for using the regional contour was to incorporate the inlet. Without the regional contour, the shoreline to the south of the inlet would straighten, and very significant amounts of accretion in this location would appear.

USGS Comment: Inlet flow dynamics – “The analysis does not consider changes to inlet cross-sectional area and friction, and how that will affect flows in/out of Great Bay. For instance, changes in tidal dynamics due to dredging could affect salinity in the Great Bay/Mullica River system. This effect can be quantified with one-dimensional classical estuarine models.”

ERDC-CHL Response: Correct, this study does not consider changes in inlet cross-sectional area and friction. Since the proposed dredging locations are outside of the inlet and will not affect the limiting cross-sectional area of the inlet, nor the entrance channels into each inland bay, which would be the controlling cross-sections of a classical estuarine model, the modeling would be expected to show no change in the hydrodynamics of the inland bays.

Additional Comments:

ERDC-CHL Response to USGS Paragraph #3 on Page #2: The STWAVE results of changes in wave energy density are provided as a qualitative indicator of the effect of proposed borrow

options. The USGS reviewers correctly remarked that the 10% change was indicated in the figures. However, the 10% value was not meant to be interpreted as a demarcation between “significant” and “insignificant” effects. Permit us to reiterate that the effect of a borrow area is mostly a redistribution of wave energy and not a large-scale alteration of wave climate. Considering the long and successful history of conceptually modeling shorelines as a diffusion problem, it is expected that small changes in energy over short reaches will result in minimal effect of in shoreline position. The ERDC-CHL report comments regarding significance are provided as qualitative guidance with a basis in engineering judgment.

The USGS review continues, "It is possible that a small but persistent impact on the wave field over the shoal could lead to a significant impact to the inlet and shoreline over the longer time intervals considered by this study." It is worth noting that the provided STWAVE wave results were developed without any bottom changes over thirty years. In actuality, the borrow sites will smooth and infill in the active littoral zone. Therefore, any presented results are exaggerated with regard to the magnitude of effect on wave energy density. So in general, the changes are indeed small, but they are unlikely to be persistent.

ERDC-CHL Response to USGS Paragraph #3 on Page #3: The USGS review suggests that swell may be underestimated from shadows of the lateral boundary. However, STWAVE treats the lateral boundaries in a simplistic way: "While land boundaries will reduce wave growth near the boundaries as they “prevent” propagation from landward directions, water-defined boundaries allow a zero-gradient type of boundary condition. This zero- gradient boundary condition allows energy consistent with that of neighboring cells to propagate into or out of the domain along the lateral boundary" (Smith et al. 2001). So while regions in the shadow may not account for bathymetric variations outside of the domain, no systematic under-prediction is expected.

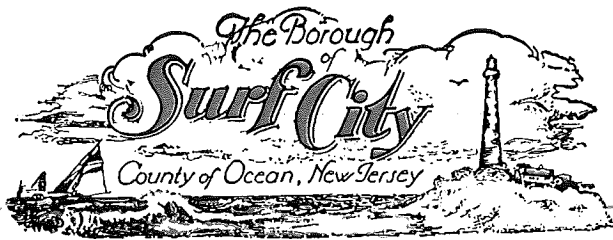
ERDC-CHL Response to USGS Paragraph #5 on Page #3: The effect of borrow regions on vegetated shorelines was beyond the scope of this effort. However, it bears repeating here that the presented wave power results were computed without bathymetric evolution. A more faithful representation would likely indicate less change. Additionally, the cited work from Leonardi et al. 2016 is based on variations in overall wave climate. Any effect of the small changes in wave energy over short reaches as demonstrated herein remains unclear.

References:

Beck, T.M., and K.R. Legault, 2012. Optimization of Ebb Shoal Mining and Beach Nourishment at St. Johns County, St. Augustine Inlet, Florida. Technical Report

ERDC/CHL-TR-12-14: Report 3, US Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, Mississippi.

Smith, J. M., A. R. Sherlock, and D. T. Resio, 2001. STWAVE: Steady-state spectral wave model user's manual for STWAVE, version 3.0. ERDC/CHL SR-01-1, Vicksburg, Mississippi. Army Engineer Research and Development Center.



March 13, 2016
813 LONG BEACH BOULEVARD
SURF CITY, N. J. 08008

Environmental Resources Branch
Philadelphia District, U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107

Re: Draft Environmental Assessment for the Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey.

Dear Sir/Madam;

I am writing on behalf of the people of the Borough of Surf City in order to submit public comment in support of the above noted project to dredge the Little Egg Harbor Inlet as an appropriate source of sand for the Long Beach Island Storm Damage Reduction Project. Review of the Draft Environmental Assessment affirms the common wisdom of the local population that the Little Egg Harbor Inlet is well suited as a borrow site for the Long Beach Island Storm Damage Reduction Project. The support of the Borough of Surf City for the utilization of the Little Egg Harbor Inlet as project borrow site is that the proposed site will:

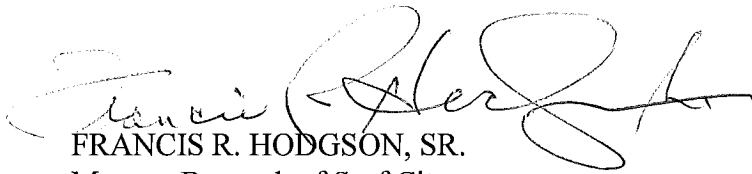
- Provide a source of good quality sand that is closer than the existing borrow areas
 - Sand obtained from the proposed Little Egg Inlet borrow area is ideally suited for placement on the southern end of the project
 - This could reduce the project costs over time due to the shorter pumping distances and better productivity afforded by different dredges
 - Shorter pumping distances reduce the use of fuel
 - This reduction of fuel usage has the potential to reduce emissions
- Provide a renewable source of sand as the shoals in the inlet readily recharge themselves due to the prominent southerly drift on most of the island
 - This ability to recharge itself makes it more sustainable than the existing borrows.
- Have the potential to temporarily alleviate navigational hazards created by deposition of sand on the ebb shoals
 - This could allow for a period safer passage for recreational and smaller commercial boats
 - The boating industry in this area has periodically suffered due to shoaling hazards

In addition, the DES indicates that dredging activities in the area of the Little Egg Harbor Inlet if properly planned, associated impacts are short-term, and will have minor ecological effects upon Long Beach Island's rich and diverse ecological systems. In fact the DES indicates that the very limited populations of benthic species which currently populate the proposed

borrow site will, based on previous experience and studies, experience population growth as new areas of sedimentation and food sources are exposed by the dredging activities on the site.

To conclude, the Borough of Surf City would like to go on public record in support of the above mentioned project as it will have sustainability accompanied by no significant impacts to the adjacent inlet shorelines due to expected longshore transport of sand to the south from the placement site. Thank you for the opportunity to share in the public comment process and encourage a positive decision regarding the DES is made forthwith so that the Long Beach Island Storm Damage Reduction Project may be completed in a timely manner.

Sincerely,

A handwritten signature in black ink, appearing to read "Francis R. Hodgson, Sr.", written in a cursive style.

FRANCIS R. HODGSON, SR.
Mayor - Borough of Surf City

March 15, 2016

Environmental Resources Branch
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA. 19107-3390
pdpa-nap@usace.army.mil

ATTN: J. Bailey Smith, Coastal Scientist/Project Manager/Coastal Planning Section
Barbara Conlin, Project Biologist

RE: Public Comment
Proposed Sand Borrow Area in Little Egg Harbor Inlet
Ocean and Atlantic Counties, New Jersey

Dear Sir and Madam:

We received a copy of the Draft Environmental Assessment for the Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, NJ.

Our concern is within the proposed Little Egg Inlet borrow area pictured in Figure 2-3 of the Draft Environmental Assessment report. In 1996 Rutgers University had installed a fiber optic cable from the Rutgers University Marine Field Station (RUMFS), located at the end of Great Bay Blvd. Tuckerton, New Jersey through Little Egg Inlet. The cable runs to two underwater Nodes (A & B) that comprise a Long-term Ecosystem Observatory, referred to as LEO-15. The Nodes are located in 12 & 15 meters of water and are approximately 8.1 and 9.8 kilometers respectively from RUMFS. The cable was installed (buried) to a depth of 3 feet. A review of the above noted document and Figure 2-3 (page 16) indicates a potential conflict in that the proposed borrow area includes the burial area of the fiber optic cable for the undersea observatory.

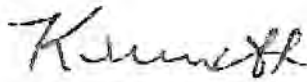
The coordinates for the routing of the fiber cable and Node locations are listed below and illustrated in Attachment 1.

A/C 1	39 30.2880'N and 74 19.3620'W	NAD83 State Plane: Northing 246125; Easting 541769
A/C 2	39 28.4790'N and 74 17.0570'W	NAD83 State Plane: Northing 238654; Easting 548684
A/C 3	39 28.617N and 74 17.500'W	NAD83 State Plane: Northing 234514; Easting 551048
Node A	39 27.6788'N and 74 15.7601'W	NAD83 State Plane: Northing 228907; Easting 559406
Node B	39 27.4131'N and 74 14.7458'W	NAD83 State Plane: Northing 220127; Easting 567462

Sincerely,



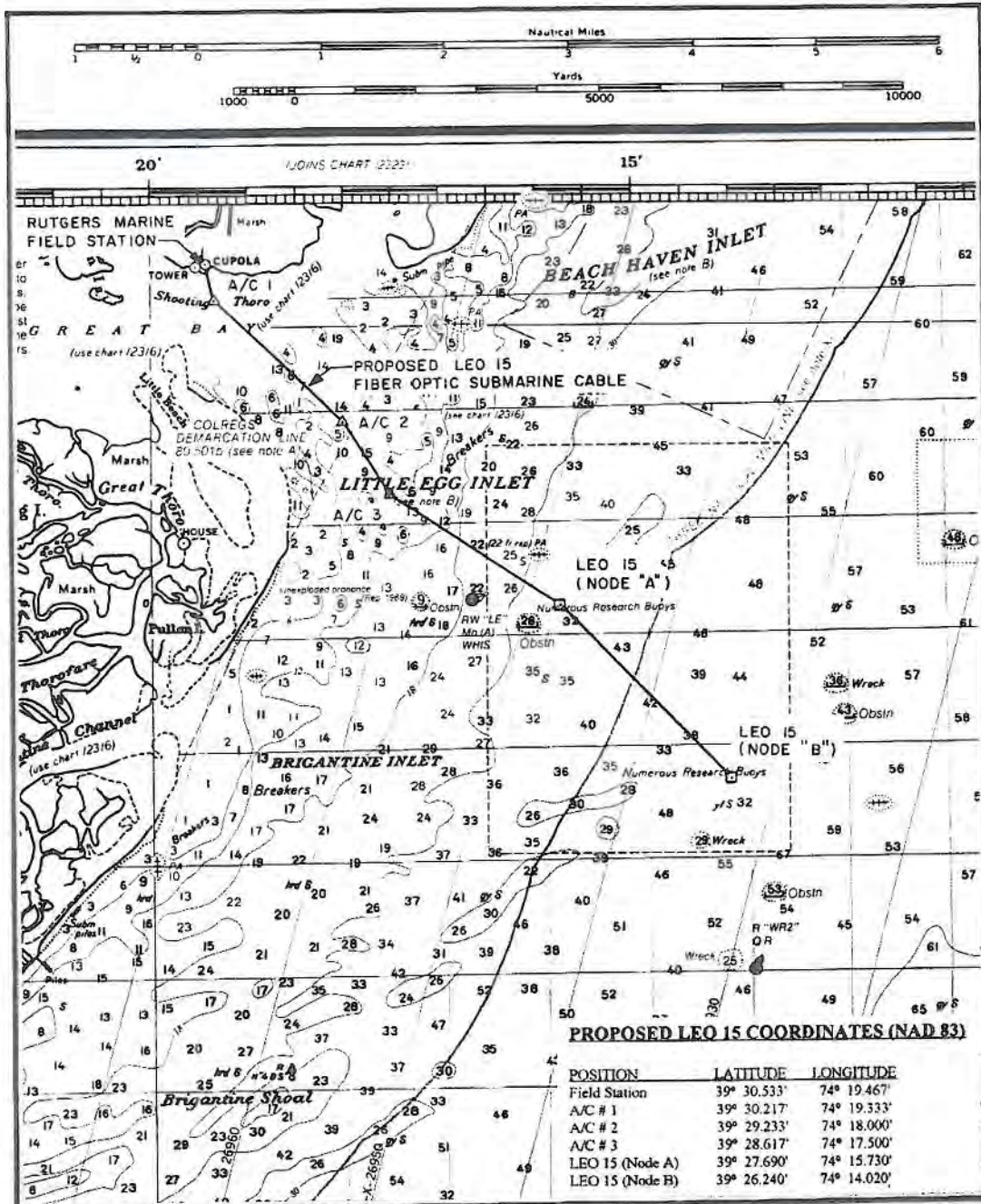
Rosemarie Petrecca
Senior Marine Scientist
RU Marine Field Station
Tuckerton, NJ 08087




Dr. Kenneth Able
Director
RU Marine Field Station
Tuckerton, NJ 08087



Michael De Luca
Manager
Jacques Cousteau National Estuarine Research Reserve
Tuckerton, NJ 08087



INSTITUTE OF MARINE & COASTAL SCIENCES	PROJECT LOCATION	 NORTH	FIGURE 3
	LEO 15 FIBER OPTIC SUBMARINE CABLE LITTLE EGG HARBOR TWP, OCEAN COUNTY, NEW JERSEY		
RUTGERS UNIVERSITY	NOAA NAUTICAL CHART 12318 LITTLE EGG INLET TO HEREFORD INLET	SCALE: 1: 80,000 DATE: APRIL 1, 1995	SHEET 1 OF 1

Attachment 1. Coordinates for fiber optic cable route servicing the Long-term Ecosystem Observatory (LEO-15).

USACE Responses to Rutgers Marine Field Station Letter dated 15 March 2016

Rutgers Comment: In 1996 Rutgers University had installed a fiber optic cable from the Rutgers University Marine Field Station (RUMFS), located at the end of Great Bay Blvd. Tuckerton, New Jersey through Little Egg Inlet. The cable runs to two underwater Nodes (A&B) that comprise a Long-term Ecosystem Observatory, referred to as LEO-15. The Nodes are located in 12 & 15 meters of water and are approximately 8.1 and 9.8 kilometers respectfully from RUMFS. The cable was installed (buried) to a depth of 3 feet. A review of the above mentioned document and Figure 2-3 (page 16) indicates a potential conflict in that the proposed borrow area includes the burial area of the fiber optic cable for the undersea observatory.

USACE Response: Noted. The following has been added to the final EA in Section 4.9 Areas of Concern: “There is a fiber optic research cable buried within the Little Egg Inlet borrow area vicinity that will have a minimum of 500 foot buffer zones established on both sides where dredging is prohibited. The contractor will be required to contact the cable owner (*i.e.* Rutgers University Marine Field Station) to discuss the dredging work plan, obtain restrictions on the laying of submerged pipeline, anchoring and any other dredging operations around these cables.” Detailed coordinates and description will also be added to the Specifications”. A figure (Figure 4-1) has been added to the EA to delineate the cable’s location and buffers.



DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

MAR 17 2016

Kim Damon-Randall
Assistant Regional Administrator for Protected Resources
Greater Atlantic Regional Fisheries Office
NOAA's National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Damon-Randall:

In accordance with Section 102 of the National Environmental Policy Act and Section 7 of the Endangered Species Act, we recently requested your review and comment of the draft Environmental Assessment (EA) for the *Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey*. After further coordination with Mr. Zach Jylkka of your office, this letter serves to provide additional information regarding our determination that re-initiation of formal Section 7 consultation is not warranted for the inclusion of a new borrow area for this project.

The EA (2016) presents an evaluation of potential environmental impacts of dredging sand from an ebb shoal area immediately offshore of Little Egg Inlet for placement on Long Beach Island. The EA tiers from two previously published documents: the Final Feasibility Report and Integrated Environmental Impact Statement (EIS, 1999) and Final Environmental Assessment Barnegat Inlet to Little Egg Inlet Storm Damage Reduction Project, Ocean County, New Jersey (2014).

The project was authorized in 2000, and is being funded in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on 29 January 2013 in response to the devastating coastal storm, known as Hurricane Sandy that struck the Eastern region of the United States in October 2012. Initial construction began in 2006 and is currently ongoing. To date, fill has been placed in Surf City, Ship Bottom, Harvey Cedars, and the Brant Beach section of Long Beach Township as funding became available.

The selected plan for restoring LBI's beach berm and dunes calls for placement of sand along the shoreline from Seaview Drive, Loveladies to the


terminal groin in Holgate, Long Beach Township. The USACE proposes to remove approximately 8.4 million cubic yards (mcy) of material from Borrow Areas D1, D2 (located in Federal waters), and the proposed Little Egg Inlet borrow area to complete initial construction, and approximately 2.0 mcy every 7 years over the authorized 50-year project period scheduled to end in 2055. The current estimated quantity of sand needed to complete initial construction is higher than what was previously coordinated with your office in the 2014 BO. This quantity does not constitute a significant increase in the estimated quantities. The BO states that it is expected that no more than 1 Atlantic sturgeon would be injured or killed for approximately every 8.6 mcy of material removed by a cutterhead dredge. The increase in quantity still falls within this estimated threshold, therefore it does not increase the expected risk to Atlantic sturgeon. Sand pumped from the proposed Little Egg inlet borrow area would reduce a commensurate quantity dredged from the other offshore borrow areas D1 and D2, and would be removed by an hydraulic cutterhead suction dredge to be placed on the southernmost reaches of the placement site (Holgate).

The 2014 EA evaluated Borrow Areas D1 and D2 to assess dredging impacts on benthic macroinvertebrates) and from within the proposed Little Egg Inlet borrow area in the 2016 EA. Results of the benthic sampling indicated that the benthic communities within the borrow areas are not unique or uncommon in the Long Beach Island region. Changes observed within the benthic community of Borrow Area D1 sampled both before and after dredging appeared to be more highly associated with sampling year variability than due to slight variances in sand grain size percentages.

The USACE will adhere to the procedures outlined in your *Biological Opinion (BO) on the Use of Sand Borrow Areas for Beach Nourishment and Hurricane Protection, Offshore Delaware and New Jersey (NER-2014-10904)*, prepared by your office June 2014. The proposed design template for the LBI project has not changed. Based on our findings that the benthic community composition of the borrow areas is similar; the beachfill design template has not changed; the increase in sand quantity is not significant; and any quantity of sand removed from the proposed Little Egg Inlet borrow area will reduce the necessary quantities dredged from the other borrow areas for placement, we have determined that the proposed project modifications will not result in any effects to listed species that were not previously analyzed in the 2014 Biological Opinion, and thus reinitiation of formal consultation is not necessary. This determination is in regard to the potential direct, indirect, and cumulative impacts to the federally listed Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), shortnose sturgeon (*Acipenser brevirostrum*) and four sea turtle species: loggerhead (*Caretta caretta*), Kemp's Ridley (*Lepidochelys kempi*), leatherback (*Dermochelys coriacea*) and green (*Chelonia mydas*) that may occur in area.

At this time, we request that you concur with our determination that additional consultation on this project is not necessary. If you have any questions or require additional information, please contact Ms. Barbara Conlin of the Environmental Resources Branch at (215) 656-6557; (Barbara.E.Conlin@USACE.army.mil) or Mr. Keith Watson of Project and Program Management Division at (215) 656-6287 (Keith.D.Watson@USACE.army.mil).

Sincerely,

for 
Peter R. Blum
Chief, Planning Division



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

MAR 30 2016

Peter R. Blum, Chief
Planning Division
Department of the Army
Philadelphia District, Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390

RE: Modifications to the New Jersey and Delaware Beach Nourishment Project

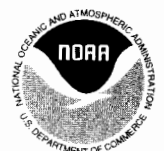
Dear Mr. Blum:

We consulted previously on the U.S. Army Corps of Engineers (USACE), Philadelphia District's New Jersey and Delaware Beach Nourishment project, resulting in our issuance of a biological opinion (Opinion) to you (USACE) and the Bureau of Ocean Energy Management (BOEM) on June 26, 2014.¹ In a letter dated March 17, 2016, you requested that we concur with your determination that modifications to the project do not require reinitiation of the 2014 Opinion. As the newly proposed action does not cause any effects not already considered in the 2014 Opinion, and no other triggers for reinitiation have been met, we concur with your determination that the proposed modifications do not trigger the need to reinitiate consultation pursuant to section 7 of the ESA, as amended. Our supporting analysis is provided below.

Consultation History

On November 26, 1996, we issued a Biological Opinion addressing the effects of all dredging authorized or carried out by the Philadelphia District including navigation projects, coastal engineering, and authorization of dredging activities carried out by individuals under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The New Jersey and Delaware Beach Nourishment project was authorized in 2000, and is funded in accordance with The Disaster Relief Appropriations Act of 2013, reference 1(a) (PL 113-2), which was passed by Congress and signed into law on January 29, 2013 in response to Hurricane Sandy in 2012. Initial construction and beach nourishment for the townships began in 2006 and to date, fill has been placed in Surf City, Ship Bottom, Harvey Cedars, and the Brant Beach section of Long Beach Township as funding has become available.

¹ All of these projects involve the removal of sediment with a dredge and beneficial use of sand along area beaches. For sand borrow areas on the Outer Continental Shelf, an authorization from BOEM is necessary, therefore, BOEM is an action agency for this consultation. USACE is the lead action agency for the consultation.



The New Jersey and Delaware Beach Nourishment project was originally covered by the 1996 Opinion. However, following the ESA listing of Atlantic sturgeon in 2012, our agencies decided to replace the 1996 Opinion with several Opinions that each considered a smaller scope of specific activities. This decision resulted in our issuance of a new Opinion to you and BOEM on June 26, 2014 that focused only on the New Jersey and Delaware Beach Nourishment project.

The 2014 Opinion concluded that the project may adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine, New York Bight, Chesapeake Bay and South Atlantic distinct population segments (DPS) of Atlantic sturgeon, or Kemp's ridley, green or the Northwest Atlantic DPS of loggerhead sea turtles and is not likely to adversely affect leatherback sea turtles, the Carolina DPS of Atlantic sturgeon, right, fin or humpback whales. Because no critical habitat is designated in the action area, none will be affected by the proposed action.

The 2014 Opinion included an Incidental Take Statement (ITS) exempting the incidental take of no more than one Atlantic sturgeon for every 8.6 mcy dredged with a hopper or cutterhead dredge. Over the life of the project, the ITS exempts the incidental take of 16 Atlantic sturgeon. All Atlantic sturgeon are likely to be subadults, and would come from the following DPSs: 9 New York Bight, 3 South Atlantic, 3 Chesapeake Bay, and 1 Gulf of Maine. The Opinion also exempted the incidental take of no more than one ESA-listed sea turtle for every 3.8 MCY removed with a hopper dredge, or a total of 32 sea turtles (29 loggerheads from the Northwest Atlantic DPS, 2 Kemp's ridley, and 1 green sea turtle). The 2014 Opinion did not anticipate any incidental take of sea turtles from cutterhead dredging activities.

On February 23, 2016, you sent us a letter asking that we review an Environmental Assessment (EA), titled *Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey* for the addition of a borrow area for beach nourishment that was not previously considered in the 2014 Opinion.

Proposed Modification to the Action

The modification to the project (assessed in the 2016 EA referenced above) focuses on the restoration plan for Long Beach Island (LBI). Previously for LBI restoration, the 2014 Opinion considered the removal of 7.8 mcy from Borrow Areas D1 and D2 (2.9 mcy and 4.9 mcy from Areas D1 and D2, respectively), with 2.0 mcy every 7 years (from either Area of a combination of the two) over the 50-year project period. The Opinion considered the use of a hopper dredge or cutterhead dredge for this work. The dredged sand would be placed to restore LBI beach berm and dunes by placing sand along the shoreline from Seaview Drive, Loveladies to the terminal groin in Holgate, Long Beach Township.

Because the pumping distances from Borrow Areas D1 and D2 to the southern portion of the LBI project site would be cost prohibitive, you have determined that an additional viable sand source of significant quantity, located closer to the southern portion of the project area, is needed. You are now proposing to modify the LBI restoration plan to include the removal of approximately 8.4 mcy of material from Borrow Areas D1, D2 (located in Federal waters), and the new Little Egg Inlet borrow area to complete initial construction, and approximately 2.0 mcy every 7 years

over the authorized 50-year project period scheduled to end in 2055 (see Figure 1). Sand pumped from the proposed Little Egg Inlet Borrow Area would reduce a commensurate quantity dredged from Borrow Areas D1 and D2, and would be removed by an hydraulic cutterhead suction dredge to be placed on the southernmost reaches of the placement site (Holgate).

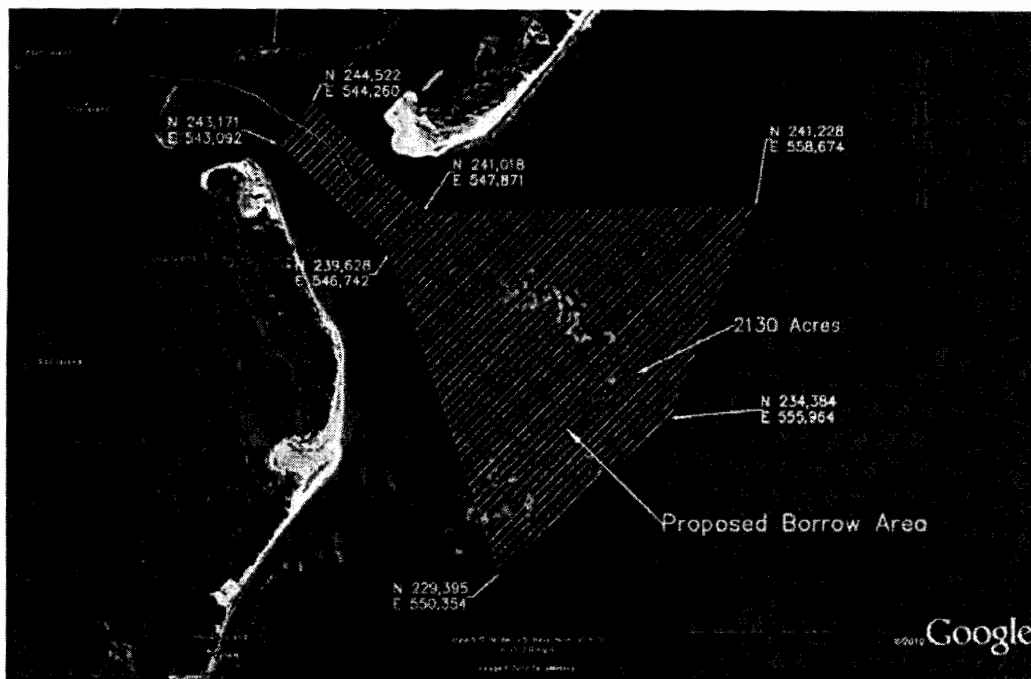


Figure 1: Proposed Little Egg Inlet Borrow Area (from the 2016 EA)

Therefore, the proposed modification includes the use of a new sand borrow area (using only a cutterhead dredge) and a net increase of 600,000 cy of sand (from 7.8 mcy to 8.4 mcy). The use of the sand for restoration is unchanged. All other components of the project would remain as described and analyzed in the 2014 Opinion, and you will continue to adhere to all Reasonable and Prudent Measures (RPMs) and associated Terms and Conditions (TCs).

Review of Reinitiation Requirements

Reinitiation of consultation is required and shall be requested by you or by us, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (1) the amount or extent of taking specified in the incidental take statement (ITS) is exceeded; (2) new information reveals effects of the action that may not have been previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat not considered in the Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

An ITS was provided with the 2014 Opinion and the amount, or extent, of take exempted by the ITS has not been exceeded (1). There is no new information on use of the action area by listed species or on effects of the action that was not considered in the 2014 Opinion (2). Additionally, there have been no new species listed or critical habitat designated in the action area (4). Although you are proposing to modify the identified action (3) by allowing cutterhead dredging in the Little Egg Inlet Borrow Area, we have determined that this modification will not cause any effects to listed species not considered in the Opinion. Our justification is below.

In the Effects of the Action section of the 2014 Opinion, we considered the use of cutterhead dredges in Borrow Areas D1 and D2. You have proposed to authorize use of cutterhead dredging in the Little Egg Inlet Borrow Area, which is approximately 16 miles south of Borrow Areas D1 and D2. Comparing your 2014 EA (for the project as considered in the 2014 Opinion) and 2016 EA results, you have determined that the benthic community composition of Borrow Areas D1, D2, and Little Egg Inlet are similar.

In the 2014 Opinion, we considered the effects of cutterhead dredging (alteration of prey items and foraging behavior, exposure to increased suspended sediment (turbidity), interactions between project vessels) to sturgeon and sea turtles in Borrow Areas D1 and D2 and determined these effects would be insignificant and discountable. These effects to sturgeon and sea turtles during proposed cutterhead dredging in the Little Egg Inlet Borrow Area would be the same. Therefore we agree with your determination that the introduction of the Little Egg Inlet Borrow Area does not introduce any effects to listed-species not previously considered in the Opinion.


In the Effects of the Action section of the Opinion, we considered effects of entrainment and impingement of sturgeon and sea turtles due to cutterhead dredging in Borrow Areas D1 and D2. We have determined that the risk of entrainment or impingement to sturgeon and sea turtle is the same in the Little Egg Inlet Borrow Area as the D1 and D2 Borrow Areas previously analyzed. The Opinion's ITS (for the entirety of the project), estimated that no more than one Atlantic sturgeon will be injured or killed for approximately every 8.6 mcy of material removed during cutterhead dredging operations in the action area. We do not anticipate any incidental take of sea turtles from cutterhead dredging activities

The proposed project modification involving the cutterhead dredging of the Little Egg Inlet Borrow Area presents a net increase of only 600,000 cy of sand from the volume originally considered in the Opinion for the LBI restoration project. The removal of an additional 600,000 cy of material will not increase the total amount dredged (8.4 mcy) above the ITS threshold (8.6 mcy) for an additional take of Atlantic sturgeon. Given that the risk of entrainment or impingement to Atlantic sturgeon in the Little Egg Inlet Borrow Area is the same as in Borrow Areas D1 and D2, and the additional amount of material to be dredged is below the overall amount of material dredged before an additional sturgeon is likely to be injured or killed, we have determined that this modification to the project will not change our analysis of the amount or extent of take exempted by the ITS in the 2014 Opinion and will not affect sturgeon beyond what was considered in the 2014 Opinion.

Conclusion

Based on this analysis of the re-initiation triggers, we have determined that the modifications to the action will not cause any effects not already considered in the 2014 Opinion. None of the other reinitiation triggers have been met; therefore, reinitiation of consultation is not necessary. The conclusions reached in our June 26, 2014 Opinion remain valid, and no further consultation is necessary at this time. We look forward to continuing to work cooperatively with your office to minimize the effects of dredging projects in the Philadelphia District on listed species. For further information regarding any consultation requirements, please contact Zach Jylkka of my staff at (978) 282-8467 or by e-mail (Zachary.Jylkka@noaa.gov). Thank you for working cooperatively with my staff throughout this consultation process.

Sincerely,


7a Kimberly B. Damon-Randall
Assistant Regional Administrator
for Protected Resources

EC: Marrone, GARFO/PRD
Greene, GARFO/HCD
Conlin, USACE
Waldner, BOEM

File Code: H:\Section 7 Team\Section 7\Non-Fisheries\ACOE\Formal\ 2014\NJ and DE offshore beach nourishment
PCTS: NER-2014-10904

BOROUGH OF HARVEY CEDARS

PO BOX 3185

HARVEY CEDARS, NEW JERSEY 08008-0319

BOARD OF COMMISSIONERS

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DEPT. OF PUBLIC SAFETY AND PUBLIC AFFAIRS



DAINA A. DALE
MUNICIPAL CLERK

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VIA EMAIL – Public Affairs Office pdpa-nap@usace.army.mil

March 17, 2016

COMMENTS REGARDING: The Draft Environmental Assessment for the Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project

To Whom It May Concern:

The Board of Commissioners of the Borough of Harvey Cedars strongly supports the use of the proposed Little Egg Inlet borrow area for use in the Long Beach Island Storm Reduction Project.

The US Army Corps of Engineers must have access to borrow areas of high quality sand material within a reasonable distance to the placement site. Sand obtained from the Little Egg Inlet proposed borrow area is ideally suited for placement on the southernmost portion of the LBI project. The use of the site is cost effective for this project, it will enhance maritime navigation, alleviate back-bay flooding, and ultimately boost tourism. Harvey Cedars wholeheartedly encourages the use of the Little Egg Inlet as a borrow area.

Harvey Cedars Board of Commissioners
Jonathan Oldham, Mayor
Judith Gerkens, Commissioner
Michael Garofalo, Commissioner

cc: 9th Legislative District Representatives via regular mail
Congressman Frank LoBiondo via regular mail

JOSEPH H. MANCINI
MAYOR
DIRECTOR OF PUBLIC AFFAIRS & SAFETY

JOSEPH P. LATTANZI
COMMISSIONER
DIRECTOR OF REVENUE & FINANCE

RALPH H. BAYARD
COMMISSIONER
DIRECTOR OF PUBLIC WORKS, WATER/SEWER



LYNDA J. WELLS
MUNICIPAL CLERK

6805 Long Beach Boulevard
Brant Beach, New Jersey 08008

website:
www.longbeachtownship.com

March 18, 2016

Phone (609) 361-1000
Fax (609) 494-5421

To whom it may concern:

I am writing today in support of the use of Little Egg Inlet as a borrow source for the federal Long Beach Island storm damage reduction project. Using Little Egg Inlet as a source for the beach fill sand is a smart choice for the project and environment, and makes the future of the island more resilient.

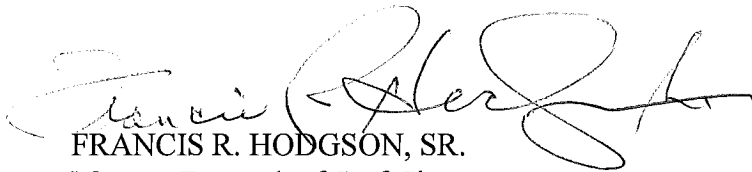
If approved, having the option of using Little Egg Inlet as a borrow area will:

- Provide a source of good quality sand that is closer than the existing borrow areas
 - Sand obtained from the proposed Little Egg Inlet borrow area is ideally suited for placement on the southern end of the project
 - Sand obtained from Inlet will be of the same or higher quality because sand follows a natural migration from the beaches into the Little Egg Inlet
 - This could reduce the project costs over time due to the shorter pumping distances and better productivity afforded by different dredges
 - Shorter pumping distances reduce the use of fuel
 - This reduction of fuel usage has the potential to reduce emissions
- Provide a renewable source of sand as the shoals in the inlet readily recharge themselves due to the prominent southerly drift on most of the island
 - This ability to recharge itself makes it more sustainable than the existing borrows.
- Have the potential to temporarily alleviate navigational hazards created by deposition of sand on the ebb shoals
 - This could allow for a period safer passage for recreational and smaller commercial boats
 - The boating industry in this area has periodically suffered due to shoaling hazards

borrow site will, based on previous experience and studies, experience population growth as new areas of sedimentation and food sources are exposed by the dredging activities on the site.

To conclude, the Borough of Surf City would like to go on public record in support of the above mentioned project as it will have sustainability accompanied by no significant impacts to the adjacent inlet shorelines due to expected longshore transport of sand to the south from the placement site. Thank you for the opportunity to share in the public comment process and encourage a positive decision regarding the DES is made forthwith so that the Long Beach Island Storm Damage Reduction Project may be completed in a timely manner.

Sincerely,

A handwritten signature in black ink, appearing to read "Francis R. Hodgson, Sr.", written in a cursive style.

FRANCIS R. HODGSON, SR.
Mayor - Borough of Surf City



In Reply Refer To:
16-CPA-0075a

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205
Tel: 609/646 9310
Fax: 609/646 0352
<http://www.fws.gov/northeast/njfieldoffice>



Peter Blum, Chief
Planning Division
Philadelphia District
U.S. Army Corps of Engineers
100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
ATTN: Barbara Conlin

MAR 22 2016

Dear Mr. Blum:

The U.S. Fish and Wildlife Service (Service) reviewed the February 2016 *Draft Environmental Assessment - Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project Ocean County, New Jersey* (draft EA) as requested in the U.S. Army Corps of Engineers, Planning Division (Corps) letter dated February 23, 2016. The subject letter also contains a request for streamlined (Tier 2) formal consultation regarding the use of Little Egg Inlet as a sand borrow area for proposed beach re-nourishment activities in the approved Barnegat Inlet to Little Egg Inlet, Ocean County, New Jersey Coastal Storm Damage Reduction Project.

Specifically, the Corps proposes to re-nourish beaches in the southern portion of the project with sand dredged from Little Egg Inlet, removing approximately 1.9-2.0 million cubic yards (mcy) of sand every 7 years for periodic nourishment, depending on how frequent significant storm events erode the Long Beach Island project template.

The Service also received a second letter from the Corps dated February 16, 2016 responding to questions and comments provided in the Service's February 2016 *Planning Aid Report - Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project Ocean County, New Jersey* (PAR) in regard to the *Borrow Area Analysis of Little Egg Inlet, New Jersey* provided by the U.S. Army Engineer Research and Development Center (ERDC). Concurrently, the Service requested the U.S. Geological Survey (USGS) to review the ERDC models. The USGS provided their review to the Service in a letter dated March 4, 2016. The USGS review was provided electronically to the Corps on March 10, 2016. Representatives of the Service, Corps, National Marine Fisheries Service, and New Jersey Department of Environmental Protection also participated in a conference call on March 1, 2016.

AUTHORITY

This response is provided pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of endangered and threatened species, and the National Environmental Policy Act of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321 *et seq.*).

FEDERALLY LISTED SPECIES UNDER SERVICE PURVIEW

In the February 23 letter, the Corps requested initiation of streamlined (Tier 2) formal consultation pursuant to the Service's December 2005 Programmatic (Tier 1) Biological Opinion on the Effects of Federal Beach Nourishment, Re-nourishment, Stabilization, and Restoration Activities along the Atlantic Coast of New Jersey within the Corps, Philadelphia District on the Federally Listed (threatened) Piping Plover (*Charadrius melodus*) and Seabeach Amaranth (*Amaranthus pumilus*) (PBO). During the March 1, 2016 conference call, the Service advised the Corps that Little Egg Inlet is not an authorized borrow area in the PBO and, therefore, the Service cannot provide a streamlined Tier 2 letter to the Corps. In the aforementioned letter, the Corps provided a determination of “not likely to adversely affect” the piping plover, seabeach amaranth, and red knot (*Calidris canutus rufa*) on the proposed removal of approximately 1.9-2.0 mcy of sand from Little Egg Inlet every seven years (as needed). The Service will consider this determination as initiating the informal consultation process pursuant to Section 7 of the ESA. The Corps did not request a conference with the Service on the proposed designation of critical habitat for the red knot within and in the vicinity of the study area as recommended by the Service in the PAR.

COMMENTS OF THE EDWIN B. FORSYTHE NATIONAL WILDLIFE REFUGE

The Service's Edwin B. Forsythe National Wildlife Refuge (Forsythe NWR) recommends that the Corps divide the project area into sections. The potential impacts to natural resources at Forsythe NWR are different nearer the shoreline than farther into the ocean. Thus, the Corps might develop a preferred alternative that minimizes or eliminates land-based concerns of the Service.

The Affected Environment section of the draft EA should highlight the unique situation of the Little Egg Inlet in that it has never been dredged, is bounded by two naturally functioning wilderness areas, and that the inlet is part of a much larger ecosystem fed by water that flows through the largely undeveloped Pinelands National Reserve via the Bass River. It is one of a few remaining estuaries on the East Coast that been spared over-development and massive habitat destruction (Rice 2014). The Environmental Effects section of the draft EA should then address how the project will impact that ecosystem.

Section 3.1.1 - The last paragraph of this section refers to the area's salt marshes. Not all salt marshes in the vicinity are managed by the Service. Additionally, salt marsh is not the only habitat that comprises the 6,600 acres of the Brigantine National Wilderness Area. That area also encompasses Forsythe NWR's beaches and vegetated upland habitat.

Section 3.1.3 - Approximately 80% of Forsythe NWR is classified as salt marsh.

Section 4.1.1 - While making general statements of no impact, the draft EA does not specifically address impacts to Little Beach Island. Only impacts to Holgate are addressed. Please explain specific impacts to dune and nearshore habitat on Little Beach Island if dredging were to occur in the inlet as proposed.

Section 4.1.2 - The EA seems to misquote the Service's PAR by stating the area's marshes are "one of the largest untouched marshes in New Jersey." The report references the Great Bay Boulevard Wildlife Management Area as probably being the largest untouched marsh in New Jersey. Please clarify.

In regard to Wilderness Areas (Holgate and Little Beach Units), in addition to providing a highly protected type of wildlife habitat, the Wilderness Areas exhibit qualities/values that would be impacted by the proposed project. The Corps has not addressed the specific impacts to wilderness characteristics that were requested in the Service's Planning Aid Report.

Overall, the Corps should clearly define operation and methodology; duration of dredging operations; and location of all impact areas in and out of the proposed borrow areas (e.g., staging, piping, dredge operation area). It is difficult to determine impacts without these details.

USGS REVIEW OF THE ERDC MODEL

The USGS raised a number of concerns concerning the assumptions and conclusions derived from the ERDC model, including:

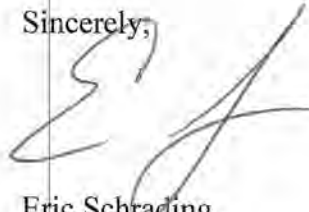
- The wave input is taken from stations offshore of the proposed borrow area and does not account for the changes that may result from dredging.
- A 10% increase in shoreline erosion is considered significant by USGS.
- The ERDC assumptions regarding downdrift erosion of Little Beach Wilderness Area are not realistic.

CONCLUSIONS

The Service recommends that the Corps reconsider the Finding of No Significant Impact and provide a revised draft EA addressing all concerns raised by the Forsythe NWR and USGS. At this time, the Service cannot concur with the Corps' determination of not likely to adversely affect the piping plover, red knot, and seabeach amaranth. Additional consultation with the Service is necessary under Section 7 of the ESA. If the Corps cannot demonstrate or bring (through altered project design or conservation measures) all adverse effects to the level of insignificant or discountable, formal consultation will be required.

Please contact Carlo Popolizio at (609) 382-5271 if you have any questions or require further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Schradung', written over a horizontal line.

Eric Schradung
Field Supervisor

REFERENCE

Rice, T.M. 2014. Inventory of Habitat Modifications to Tidal Inlets in the U.S. Atlantic Coast Breeding Range of the Piping Plover (*Charadrius melodus*) prior to Hurricane Sandy: South Shore of Long Island to Virginia. Terwilliger Consulting, Incorporated, Locustville, Virginia. 25 pp.

cc: Karen.Greene@noaa.gov
christina.davis@dep.nj.gov
todd.pover@conservewildlifenj.org
Virginia_Rettig@fws.gov
Rich_Albers@fws.gov
Paul_Castelli@fws.gov
kelly.davis@dep.nj.gov

ES:NJFO:Cpopolizio:VR:ww:RP:ES:VR:cap: 3/14/16
P:/Shared/Carlo/16-CPA0075a [LEI response]



BOROUGH OF SHIP BOTTOM

GATEWAY TO LONG BEACH ISLAND

1621 Long Beach Boulevard

Ship Bottom, Ocean County, N.J. 08008
(609) 494-2171 or 2172 Fax (609) 361-8484

U.S. Army Corps of Engineers,
Philadelphia District

Re: Little Egg Inlet Sand Resource Borrow Area

April 7, 2016

Dear Sir or Madam,

I am writing today on behalf of the Borough of Ship Bottom in support of the use of Little Egg Inlet as a borrow source for the federal Long Beach Island storm damage reduction project. Using Little Egg Inlet as a source for the beach fill sand is a smart choice for the project and environment, and makes the future of the island more resilient.

If approved, having the option of using Little Egg Inlet as a borrow area will:

- Provide a source of good quality sand that is closer than the existing borrow areas
 - Sand obtained from the proposed Little Egg Inlet borrow area is ideally suited for placement on the southern end of the project
 - This could reduce the project costs over time due to the shorter pumping distances and better productivity afforded by different dredges
 - Shorter pumping distances reduce the use of fuel
 - This reduction of fuel usage has the potential to reduce emissions
- Provide a renewable source of sand as the shoals in the inlet readily recharge themselves due to the prominent southerly drift on most of the island
 - This ability to recharge itself makes it more sustainable than the existing borrows.
- Have the potential to temporarily alleviate navigational hazards created by deposition of sand on the ebb shoals
 - This could allow for a period safer passage for recreational and smaller commercial boats
 - The boating industry in this area has periodically suffered due to shoaling hazards

It is our understanding that the Corps of Engineers and the NJDEP, Bureau of Coastal Engineering would like to utilize this proposed borrow area for the ongoing project. If that is allowed, it has the potential to alleviate some of the schedule burdens created by the delays that this project has experienced, and provide the opportunity to finish the construction of much of this project prior to the peak of the next storm season. As a result, this would allow Long Beach Island to be more resilient to impacts from future coastal storms.

Sincerely,

William Huelsenbeck
Mayor
Borough of Ship Bottom



DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

APR 13 2016

Mr. Eric Schrading
Field Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465


Dear Mr. Schrading:

This letter serves to provide responses to comments sent via email 10 March 2016 (Popolizio to Conlin) for a review by the U.S. Geological Survey (USGS) of the hydrodynamic modeling report titled *Borrow Area Analysis at Little Egg Inlet, New Jersey* (Frey *et al.*, 2015). The USGS evaluation was conducted by N.K. Ganju, P.S. Dalyander, J.H. List and N.G. Plan. The comment responses are provided by the report authors: A. Frey, A. S. Grzegorzewski, and B. Johnson.

Based on a thorough evaluation of historical aerial photographs over the last 141 years; hydrodynamic modeling results of potential shoreline impacts of the proposed dredging area (Frey *et al.*, 2015); previous beachfill operations at other nearby similar dynamic inlet areas over the past 15 years (*e.g.* Absecon and Hereford) showing significant infilling (+100%) in 12-18 months; beach monitoring survey data showing significant volumes of sand moving downdrift of placement locations; and the Corps' institutional knowledge of the behavior of ebb shoal formation at New Jersey inlets, the Corps has concluded that dredging within the proposed Little Egg Inlet borrow area will not pose adverse impacts to the shorelines of the Little Beach or Holgate units nor interfere with historical background processes principle for the evolution of these areas. These conclusions are supported by the information provided in the Final EA and modeling report (Frey *et al.*, 2015).

Thank you for providing us the opportunity to review the evaluation comments and provide our responses. If you have any further questions, please contact Mr. Keith Watson at 215-656-6287 or Ms. Barbara Conlin at 215-656-6557.

Encl


for PETER R. BLUM, P.E.
Chief, Planning Division

CC: Ms. Colleen Keller, NJDEP

USACE Responses to the U.S. Fish and Wildlife Service Letter dated 22 March 2016

USFWS Comment: During the March 1, 2016 conference call, the Service advised the Corps that Little Egg Inlet is not an authorized borrow area in the PBO and, therefore, the Service cannot provide a streamlined Tier 2 letter to the Corps.

USACE Response: Noted. Further coordination has been initiated and additional information provided to the Service and added to the EA in support of the Corps' position that proposed dredging is not likely to adversely affect Federally-listed species and their habitats along the shorelines of the Holgate, Little Beach Island Wilderness Areas, and state lands.

USFWS Comment: The Corps did not request a conference with the Service on the proposed designation of critical habitat for the red knot within and in the vicinity of the study area as recommended by the Service in the PAR.

USACE Response: Noted. In coordination with your office (Endangered Species Coordinator Wendy Walsh, 6 April 2016) it was concluded that the Corps will request initiation of a conference when the Service has identified the areas proposed for designation for red knot critical habitat.

USFWS Comment: The Service's Edwin B. Forsythe National Wildlife Refuge (Forsythe NWR) recommends that the Corps divide the project area into sections. The potential impacts to natural resources at Forsythe NWR are different nearer the shoreline than farther into the ocean. Thus, the Corps might develop a preferred alternative that minimizes or eliminates land-based concerns of the Service.

USACE Response: The Corps recognizes the Service's concern for how dredging may impact the shoreline habitat. Consequently, the Corps has revised the borrow area boundaries to remove the area located inside the inlet and will restrict all dredging to the areas seaward of the 0.37 mile distance offshore of the Holgate spit shoreline. A revised figure has been added to the EA to show the proposed dredging locations. Additional information has been added to the EA regarding an impact assessment study of piping plovers in Monmouth County.

Barring any catastrophic storms, the Holgate spit is expected to continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. An historical aerial photography perspective of Little Beach Island has been added to Appendix B of the EA to illustrate how Little Beach morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate these processes occurring along the shoreline due to the continual southwest natural transport. The objective in dredging the Little Egg Inlet borrow area, in addition to providing a sand source for placement on the southernmost reaches of Long Beach Island, is to provide safe navigation to the inlet while minimizing any impact to the adjacent shorelines. In such a dynamic environment, the inlet shorelines and position may change over time, as evidenced by the historical record and the Corps will need the flexibility within the delineated borrow area boundaries for future possible

dredging events to select the best location within the borrow area boundaries based on changes in ebb shoal morphology. See USACE response to the BBP Letter dated 22 March 2016.

USFWS Comment: The Affected Environment section of the draft EA should highlight the unique situation of the Little Egg Inlet in that it has never been dredged, is bounded by two naturally functioning wilderness areas, and that the inlet is part of a much larger ecosystem fed by water that flows through the largely undeveloped Pinelands National Reserve via the Bass River. It is one of a few remaining estuaries on the East Coast that been spared over-development and massive habitat destruction (Rice 2014). The Environmental Effects section of the draft EA should then address how the project will impact that ecosystem.

USACE Response: Noted. The information has been added to the EA.

USFWS Comment: Section 3.1.1 - The last paragraph of this section refers to the area's salt marshes. Not all salt marshes in the vicinity are managed by the Service. Additionally, salt marsh is not the only habitat that comprises the 6,600 acres of the Brigantine National Wilderness Area. That area also encompasses Forsythe NWR's beaches and vegetated upland habitat.

USACE Response: Noted. The information has been added to the EA.

USFWS Comment: Section 3.1.3 - Approximately 80% of Forsythe NWR is classified as salt marsh.

USACE Response: Noted. This has been corrected in Section 3.1. Section 3.1.3 presents wildlife.

USFWS Comment: Section 4.1.1 - While making general statements of no impact, the draft EA does not specifically address impacts to Little Beach Island. Only impacts to Holgate are addressed. Please explain specific impacts to dune and nearshore habitat on Little Beach Island if dredging were to occur in the inlet as proposed.

USACE Response: Noted. Additional discussion of Little Beach Island has been added to the Existing Environment section, the Impacts section, and Appendix B.

USFWS Comment: Section 4.1.2 - The EA seems to misquote the Service's PAR by stating the area's marshes are "one of the largest untouched marshes in New Jersey." The report references the Great Bay Boulevard Wildlife Management Area as probably being the largest untouched marsh in New Jersey. Please clarify.

USACE Response: Noted. Additional description has been added to clarify the land descriptions and ownership between the Federal U.S. Fish and Wildlife Service and the NJDEP.

USFWS Comment: In regard to Wilderness Areas (Holgate and Little Beach Units), in addition to providing a highly protected type of wildlife habitat, the Wilderness Areas exhibit qualities/values that

would be impacted by the proposed project. The Corps has not addressed the specific impacts to wilderness characteristics that were requested in the Service's Planning Aid Report.

USACE Response: Additional language has been added to both the Existing Conditions Section and the Impacts Section to discuss potential impacts to wilderness areas.

USFWS Comment: Overall, the Corps should clearly define operation and methodology; duration of dredging operations; and location of all impact areas in and out of the proposed borrow areas (e.g., staging, piping, dredge operation area). It is difficult to determine impacts without these details.

USACE Response: Additional language has been added to describe the proposed methodology and potential impacts to both shorelines as well as the borrow area to be more specific in the proposed location and dredge type utilized.

USFWS Comment: The USGS raised a number of concerns concerning the assumptions and conclusions derived from the ERDC model, including:

- The wave input is taken from stations offshore of the proposed borrow area and does not account for the changes that may result from dredging.
- A 10% increase in shoreline erosion is considered significant by USGS.
- The ERDC assumptions regarding downdrift erosion of Little Beach Wilderness Area are not realistic.

USACE Response: The USGS modeling report evaluation letter to the USFWS, and the Corps' responses to the USGS comments, are provided below.

USFWS Comment: The Service recommends that the Corps reconsider the Finding of No Significant Impact and provide a revised draft EA addressing all concerns raised by the Forsythe NWR and USGS. At this time, the Service cannot concur with the Corps' determination of not likely to adversely affect the piping plover, red knot, and seabeach amaranth. Additional consultation with the Service is necessary under Section 7 of the ESA. If the Corps cannot demonstrate or bring (through altered project design or conservation measures) all adverse effects to the level of insignificant or discountable, formal consultation will be required.

USACE Response: Concur: additional consultation with the USFWS is necessary and is currently being conducted. The USACE has augmented the EA to provide additional information in support of our view that the proposed project is not likely to adversely affect the piping plover, red knot, and seabeach amaranth. A copy of the modified EA will be forwarded to you for review prior to release.

The borrow area boundaries have been revised to eliminate those portions inside the inlet close to the shoreline. A figure has been added to the EA to delineate the proposed dredging location and the revised boundaries. The proposed borrow area will be used for placement operations only in Section 6 (Beach Haven and the developed portion of Holgate). The proposed dredging location, at its closest point, is about 0.37 miles off of the Holgate spit shoreline. The spit will continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging. Little Beach's

northernmost shoreline continues to grow. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate these processes occurring along the shoreline due to the continual southwest natural transport. Major storm events have significantly altered the shorelines. The objective in dredging the Little Egg Inlet borrow area, aside from providing a sand source for placement on the southernmost reaches of Long Beach Island, is to provide safe navigation to the inlet while minimizing any impact to the adjacent shorelines. In such a dynamic environment, the inlet shorelines and position may change over time, as evidenced by the historical record.

USACE Responses to U.S. Geological Survey Letter dated 4 March 2016 to Virginia Rettig, U.S. Fish and Wildlife Service Edwin B. Forsythe National Wildlife Refuge

by Ashley Frey, PE; Alison Sleath Grzegorzewski; and Bradley Johnson, PhD

U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory (ERDC-CHL)

USGS Comment: "...found that while the methods appear internally consistent, the validity of many of the model assumptions were not tested. There also appeared to be limited testing of model sensitivity to these assumptions, which would likely change the outcome..."

ERDC-CHL Response: The model did not undergo extensive sensitivity and/or model assumptions testing for this study, mainly due to the time constraints associated with this particular study. To specifically address the comment on sensitivity testing, basic sensitivity testing was indeed conducted with a straight shoreline and idealized waves. The coefficients, K1 and K2, which are the main parameters that are adjusted during calibration, were tested. K1 impacts shoreline change and longshore transport along the entire domain while adjustments to K2 are seen near structures. The Little Egg Inlet study did not include structures; therefore, adjusting K2 made very little impact. Changes to K1 can significantly affect results, but that is the purpose of this particular parameter. The adjustment of other parameters, like depth of closure, berm height, and grain size, result in less significant impacts on the calculated shorelines and transport rates compared to adjusting K1. The reason these parameters might be adjusted during calibration is because it is possible that these parameters may vary along the domain. These parameters cannot be adjusted along the domain in GenCade, so some level of calibration might be necessary to determine the most representative depth of closure, berm height, and grain size along the entire domain. It is unlikely that the depth of closure or berm height would be adjusted more than a couple of feet or that the grain size would be changed by more than 0.05 mm during this process. Minor changes to these parameters do not make a significant impact on the calculated shoreline and transport rates.

USGS Comment: "Because wave model output are provided to GenCade seaward of the proposed dredging sites, the longshore transport rates in GenCade do not change in the model in response to alterations to the bathymetry as they would in the real system, and the impacts to waves and shoreline change are therefore considered independently in this report."

ERDC-CHL Response: The USGS interpretation of the GenCade model is correct. Because the adjustments to the borrow areas in STWAVE were landward of the save stations, any modification would not impact the waves at the save station. Therefore, it was decided to use the same waves for all of the dredging alternatives. Within the Inlet Reservoir Model (IRM) within GenCade, a user can specify a dredging removal volume for a shoal within the inlet. Therefore, the volumes of the dredging events were indeed included within the GenCade model. However, as USGS indicated, alterations to the bathymetry were not included.

USGS Comment: “It cannot be assumed that there will be an accelerated rate of sediment delivery to the inlet because the beach 2.5 miles (and farther) updrift of the inlet has been renourished (having to do with “source term” see below).”

ERDC-CHL Response: The GenCade grid domain did not extend to the location of the beach nourishment activities. The source term was added to the GenCade model to account for the impacts of these beach nourishments. While it is not known for certain if additional sediment will be delivered to the inlet due to renourishment activities, it is a very reasonable assumption. When a large volume of sand is placed on a beach, it will disperse over time. In this case, transport is predominately to the south. Over time, this sand will eventually move south towards the inlet.

USGS Comment: “The justification for adding this source term appears to be that the renourishment will accelerate the delivery of sand to the south. However, the GENESIS model part of GenCade should already predict the alongshore transport rate and delivery of sand to Little Egg Inlet, both before and after the beach nourishment. The processes by which this transport would be accelerated following the renourishment, and why GENESIS is unable to model this increase, are not explained. Without the addition of a source term, the GenCade results do predict downdrift beach erosion, which is consistent with the inlet equilibrium concept, as described above.”

ERDC-CHL Response: GenCade has all of the features and capabilities of GENESIS, the model cited by the USGS reviewers. The main differences between GenCade and GENESIS are that GenCade includes inlet features and has a more user-friendly interface than GENESIS. There are other minor differences as well, but they do not impact the way the model was applied during this study. Yes, GenCade does predict longshore transport of sand. However, the GenCade domain does not include the locations to the north of Little Egg Inlet that have been nourished. GenCade is a one-line model, and GenCade assumes that the beach (berm height and depth of closure) are the same within and outside of the model domain. Therefore, if there is a beach fill directly adjacent to the GenCade grid, the model would not “know” that a beach fill exists. A source term is the only way to include a beach fill that is not included in the domain. Adding a source term to represent a beach fill is a standard modeling practice.

USGS Comment: “Additional model sensitivity studies could also evaluate the likelihood of finding a significant impact (once significance is defined) given uncertainty in the GenCade calibration parameters.”

ERDC-CHL Response: Basic sensitivity testing of the model (idealized case) has been done. K1 and K2 are longshore transport calibration coefficients. These coefficients are meant to be adjusted during the calibration process based on how well the model reproduces measured shorelines and transport rates. The other parameters were based on measurements and/or other data. The only parameters adjusted (other than K1 and K2) during the calibration process for this study were the shoal volumes, based on data availability and reasonable engineering judgment. Due to the uncertainty in the initial shoal volumes due to lack of data, it was decided that these values would be adjusted during the calibration process. It should be noted that K1 and K2 were calibrated first. The shoal volumes were adjusted at the end of the calibration process to improve the calculated shoreline position in the proximity of the inlet. This adjustment did not impact shoreline change and sand transport along most of the GenCade domain.

USGS Comment: “The wave input is taken from stations offshore of the borrow area, so the modeling study did not account for the changes in the shoal due to dredging that were modeled with STWAVE. That is, there was no explicit wave transformation over shoal to feed in to the shoreline change modeling.”

ERDC-CHL Response: Based on our experiences, a borrow area landward of wave breaking has not been addressed with GenCade before. However, GenCade has been used in the past to model dredging scenarios. GenCade was used to model several dredging alternatives at St. Augustine Inlet in Florida (Beck and Legault 2012). An external wave model like STWAVE was not used for this study because all dredging alternatives occurred within the inlet (landward of breaking). Rather, the dredge volumes were incorporated through the Inlet Reservoir Model (IRM). For another study at Beaufort Inlet in North Carolina, the external wave model, CMS-Wave, was used to provide wave input for GenCade because an internal wave model did not predict a known reversal in transport. In addition, there have been several GENESIS (the predecessor to GenCade) studies which involved borrow areas seaward of breaking including at Ship Island, MS; Nags Head, VA; and Dare County, NC.

USGS Comment: “The regional shoreline contour seems to predispose the model to recreate the historic shoreline change.”

ERDC-CHL Response: The purpose of the GenCade regional contour is to maintain the desired overall shoreline curvature. The regional contour should incorporate large-scale trends in shoreline shape, and not small-scale features that are expected to change at time scales modeled by GenCade. For that reason, all shorelines were smoothed and small-scale features were removed. While averaging the 2002, 2007, and 2012 shorelines might cause the regional contour to be similar to the 2007 shoreline, it is only used to keep the large-scale trends along the shoreline. If the GenCade model was run for many, many years and no regional contour was used, the shoreline would evolve to a straight line. If a regional contour was used in the same situation, the shoreline would evolve to the regional contour. For this particular GenCade application, the reasoning for using the regional contour was to incorporate the inlet. Without the regional contour, the shoreline to the south of the inlet would straighten, and very significant amounts of accretion in this location would appear.

USGS Comment: Inlet flow dynamics – “The analysis does not consider changes to inlet cross-sectional area and friction, and how that will affect flows in/out of Great Bay. For instance, changes in tidal dynamics due to dredging could affect salinity in the Great Bay/Mullica River system. This effect can be quantified with one-dimensional classical estuarine models.”

ERDC-CHL Response: Correct, this study does not consider changes in inlet cross-sectional area and friction. Since the proposed dredging locations are outside of the inlet and will not affect the limiting cross-sectional area of the inlet, nor the entrance channels into each inland bay, which would be the controlling cross-sections of a classical estuarine model, the modeling would be expected to show no change in the hydrodynamics of the inland bays.

Additional Comments:

ERDC-CHL Response to USGS Paragraph #3 on Page #2: The STWAVE results of changes in wave energy density are provided as a qualitative indicator of the effect of proposed borrow options. The USGS reviewers correctly remarked that the 10% change was indicated in the figures. However, the 10% value was not meant to be interpreted as a demarcation between “significant” and “insignificant” effects. Permit us to reiterate that the effect of a borrow area is mostly a redistribution of wave energy and not a large-scale alteration of wave climate. Considering the long and successful history of conceptually modeling shorelines as a diffusion problem, it is expected that small changes in energy over short reaches will result in minimal effect of in shoreline position. The ERDC-CHL report comments regarding significance are provided as qualitative guidance with a basis in engineering judgment.

The USGS review continues, "It is possible that a small but persistent impact on the wave field over the shoal could lead to a significant impact to the inlet and shoreline over the longer time intervals considered by this study." It is worth noting that the provided STWAVE wave results were developed without any bottom changes over thirty years. In actuality, the borrow sites will smooth and infill in the active littoral zone. Therefore, any presented results are exaggerated with regard to the magnitude of effect on wave energy density. So in general, the changes are indeed small, but they are unlikely to be persistent.

ERDC-CHL Response to USGS Paragraph #3 on Page #3: The USGS review suggests that swell may be underestimated from shadows of the lateral boundary. However, STWAVE treats the lateral boundaries in a simplistic way: "While land boundaries will reduce wave growth near the boundaries as they “prevent” propagation from landward directions, water-defined boundaries allow a zero-gradient type of boundary condition. This zero- gradient boundary condition allows energy consistent with that of neighboring cells to propagate into or out of the domain along the lateral boundary" (Smith et al. 2001). So while regions in the shadow may not account for bathymetric variations outside of the domain, no systematic under-prediction is expected.

ERDC-CHL Response to USGS Paragraph #5 on Page #3: The effect of borrow regions on vegetated shorelines was beyond the scope of this effort. However, it bears repeating here that the presented wave power results were computed without bathymetric evolution. A more faithful representation would likely indicate less change. Additionally, the cited work from Leonardi et al. 2016 is based on variations in overall wave climate. Any effect of the small changes in wave energy over short reaches as demonstrated herein remains unclear.

References:

Beck, T.M., and K.R. Legault, 2012. Optimization of Ebb Shoal Mining and Beach Nourishment at St. Johns County, St. Augustine Inlet, Florida. Technical Report ERDC/CHL-TR-12-14: Report 3, US Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, Mississippi.

Smith, J. M., A. R. Sherlock, and D. T. Resio, 2001. STWAVE: Steady-state spectral wave model user’s manual for STWAVE, version 3.0. ERDC/CHL SR-01-1, Vicksburg, Mississippi. Army Engineer Research and Development Center.



DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

APR 13 2016

Mr. Eric Schrading
Field Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465

Dear Mr. Schrading:

In accordance with procedures outlined in the "*Biological Opinion on the Effects of Federal Beach Nourishment Activities Along the Atlantic Coast of New Jersey Within the U.S. Army Corps of Engineers, Philadelphia District on the Piping Plover and Seabeach Amaranth*" prepared by your office in December 2005, the Philadelphia District U.S. Army Corps of Engineers (Corps) is writing to request initiation of streamlined (Tier 2) formal consultation under Section 7 of the Endangered Species Act of 1973 (87 Stat 884; 16 U.S.C. 1531 *et seq.*). This consultation request is in regard to concerns over potential direct, indirect, and cumulative impacts to the federally threatened piping plover (*Charadrius melodus*), seabeach amaranth (*Amaranthus pumilus*), and the more recently listed red knot (*Calidris canutus rufa*) for the remaining unconstructed placement areas of the *Barnegat Inlet to Little Egg Inlet (Long Beach Island) Coastal Storm Damage Reduction Project*.

A draft Environmental Assessment (EA)(USACE, 2014) for the project was provided to your office 20 November 2013, requesting your review, and a previous streamlined (Tier 2) consultation for completion of initial construction from Seaview Drive in Loveladies to the terminal groin in Holgate. Your review comments and recommendations provided 7 January 2014 were incorporated into the final report. You provided your Tier 2 streamlined consultation 22 September 2014 for potential direct and indirect effects to the piping plover and seabeach amaranth. The selected plan entails placement of sand obtained from offshore borrow areas to create a beach berm 125 feet wide at elevation +8.0 NAVD with a dune at an elevation of +22 feet NAVD. The dune would be 30 feet wide at its crest and incorporate 377 acres of planted dune grasses and 540,000 linear feet of sand fencing. The nonfederal sponsor, the New Jersey Department of Environmental Protection (NJDEP), recognizes the requirement for each municipality to develop and implement a Beach Management Plan approved by the Service and the New Jersey Division of Fish & Wildlife for those towns scheduled to receive sand replenishment.

Although the placement locations of the remaining unconstructed portions the Long Beach Island project have not changed, the red knot and northern long-eared bat

(Myotis septentrionalis) were added to the federally threatened list subsequent to the 22 September 2014 Tier 2 consultation. Red knots may occur in the project placement area, but there is no known habitat for the long-eared bat within the project placement area (USFWS, 2016). This letter requests Tier 2 streamlined consultation due to a change in the construction schedule.

The initial Notice to Proceed for the contract work was issued on 14 December 2014. The work was segmented into 6 sections for management and real estate purposes. Area 1 [Loveladies, Long Beach Township (LBT)]; Area 2 [North Beach, LBT]; Area 3 [Borough of Ship Bottom]; Area 4 [LBT Sta.571 to 680]; Area 5 [LBT Sta. 680 to 772]; and Area 6 [Beach Haven and Holgate, LBT]. Due to the NJDEP not providing the necessary real estate rights, Areas 1, 2, & 4, were suspended from work until the proper real estate easements were provided. Dredging and placement operations began in May 2015 within Area 3 (Borough of Ship Bottom). All dredging to date has utilized the authorized borrow areas D1 and D2. Dredging and placement continued in Area 5 and Area 4, which was un-suspended August 2015, until 30 December 2015, at which time Areas 3, 4, & 5 were completed. After completion of those areas, and with Areas 1 & 2 still suspended, the contractor suspended work on LBI to attend to repairs, emergency work, and contractual obligations elsewhere in the nation. The contractor is scheduled to return to LBI this month (April 2016) and complete Area 6 by the end of June 2016. Area 6 is the only section proposing to obtain sand from the Little Egg Inlet borrow area. Areas 1 & 2 (North Beach and Loveladies) will be scheduled for completion once the necessary Real Estate is provided by NJDEP; it is expected that this work will commence after June 2016 and be completed by October 2016. In addition to the current work, the Corps will be repairing the sections of completed beach within Areas 3, 4, & 5 that were damaged by the two recent severe nor'easter storms. This work will occur coincidentally with the completion of Area 1 and 2 and should be completed by February 2017.

The Corps will follow all conservation measures and the reasonable and prudent measures as outlined in the Service's aforementioned Programmatic Biological Opinion. We have concluded that the proposed beachfill placement is not likely to adversely affect piping plover, red knot, or seabeach amaranth. Although beach placement operations will be conducted within the piping plover nesting season, no nesting has occurred with the proposed fill area in 12 years. The project area is not known to provide habitat for large concentrations of red knots and there has been only one known occurrence of seabeach amaranth in 2002 between North Beach and Frazer Park. In recognition of the Service's 4 April 2016 letter to NJDEP's Division of Land Use Regulation outlining recommended steps to be taken for the protection of red knots and seabeach amaranth, the nonfederal sponsor, the NJDEP, will require the municipalities to adhere to their approved Beach Management Plans at the placement areas.

In addition to our request for initiation of streamlined (Tier 2) formal consultation for placement operations, the USACE provided a subsequent draft EA to your office in February 2016 (USACE, 2016) to propose the addition of a new borrow area to the

Long Beach Island beachfill project. This letter serves to request informal consultation for this proposed borrow area addition to the project with respect to concerns over potential direct, indirect, and cumulative impacts to the federally threatened piping plover (*Charadrius melodus*), seabeach amaranth (*Amaranthus pumilus*), and the more recently listed red knot (*Calidris canutus rufa*): Little Egg Inlet borrow area (USACE, 2016). The proposed new borrow area is not a named authorized borrow area in the Service's Programmatic Biological Opinion. As a result of the Service's review of the draft Environmental Assessment and concerns raised regarding possible adverse impacts to shoreline habitats due to dredging, the Corps reconfigured the borrow area boundaries, reducing the size of the area by 80 acres by eliminating the portion closest to the inlet (see attached figure). Most recent data indicate that piping plover and state-listed species nest along the shorelines of the inlet at the Holgate and Little Beach National Wilderness Areas along with other state listed species such as the least tern and black skimmer. Seabeach amaranth plants have recently occurred within the vicinity (1.5 miles away in 2015) and are expected to increase due to a seeding program (USFWS, 2016). Small numbers of the federally threatened red knot may occur in the project vicinity surrounding Little Egg Inlet at Holgate, Little Beach and nearby state lands. Dynamic and ephemeral features, such as sand spits, islets, shoals and sandbars provide red knot habitat (USFWS, 2016).

Beginning this spring and lasting approximately 3-4 months, the Corps proposes to dredge approximately 2 million cubic yards of sand in a channel alignment oriented east approximately 450 feet wide located 0.37 to 2.0 miles (2,000 to 10,500 feet) offshore of the inlet in the ebb shoals that develop naturally through a predominant southwestern longshore transport process. This location will best serve to alleviate hazardous shoaling to navigation by vessels transiting in and out of Little Egg Inlet. Based on a thorough evaluation of historical aerial photographs over the last 141 years; hydrodynamic modeling results of potential shoreline impacts of the proposed dredging area (Frey *et al.*, 2015); previous beachfill operations at other nearby similar dynamic inlet areas over the past 15 years (e.g. Absecon and Hereford) showing significant infilling (+100%) in 12-18 months; beach monitoring survey data showing significant volumes of sand moving downdrift of placement locations; and the Corps' institutional knowledge of the behavior of ebb shoal formation at New Jersey inlets, the Corps has concluded that dredging within the proposed Little Egg Inlet borrow area will not pose adverse impacts to the shorelines of the Little Beach or Holgate units nor interfere with historical background processes principle for the evolution of these areas. These conclusions are supported by the information provided in the Final EA and modeling report (Frey *et al.*, 2015). Responses to the U.S. Geological Survey's modeling report review are being forwarded to your office under separate cover.

The Corps will follow all conservation measures presented in our Biological Assessment to protect listed species that occur in the area as well as the reasonable and prudent measures outlined in the Service's PBO. The Corps has determined that modification of the beach, dune, intertidal and nearshore habitats of Holgate and Little Beach will not result from the proposed dredging plan and therefore, we believe the proposed dredging is not likely to adversely affect the piping plover, red knot, seabeach amaranth and other

beach nesting bird species. At this time, we are requesting a written response indicating your concurrence with our conclusion with regard to our request for streamlined (Tier 2) formal consultation for the schedule change and informal consultation for the new borrow area addition. Thank you for your attention in this matter. If you require any additional information, please contact Ms. Barbara Conlin of the Environmental Resources branch at 215-656-6557 or at Barbara.E.Conlin@USACE.army.mil.

Encl



PETER R. BLUM, P.E.
Chief, Planning Division

for

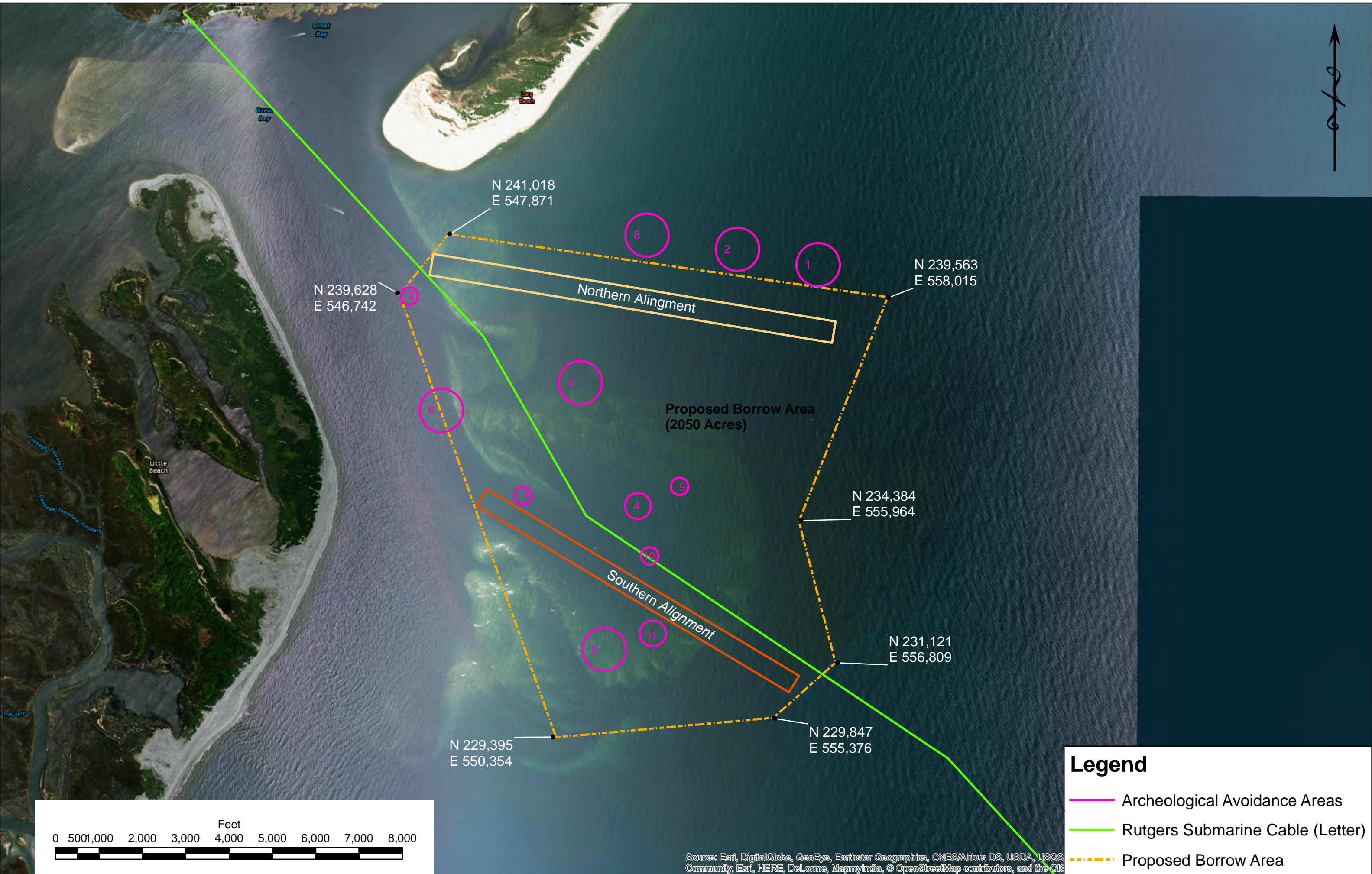
References:

Frey, A., A. Sleath Grzegorzewski, B. Johnson, 2015. *Borrow area analysis at Little Egg Inlet, New Jersey*. ERDC/CHL TR-15-XX Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE, 2016. *Draft Environmental Assessment – Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey*.

USACE, 2014. *Final Environmental Assessment, Barnegat Inlet to Little Egg Inlet (Long Beach Island) New Jersey Storm Damage Reduction Project, Ocean County, New Jersey*. U.S. Army Corps of Engineers, Philadelphia District.

USFWS, 2016. *Planning Aid Report, Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, New Jersey*.



N 241,018
E 547,871

N 239,628
E 546,742

N 239,563
E 558,015

N 234,384
E 555,964

N 231,121
E 556,809

N 229,847
E 555,376

N 229,395
E 550,354

Northern Alignment

Southern Alignment

Proposed Borrow Area
(2050 Acres)

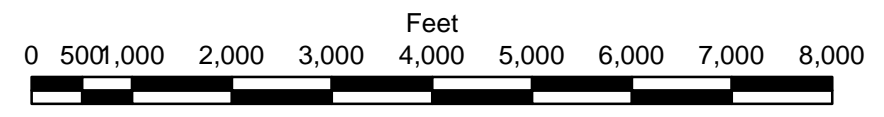
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Great Bay

Long Beach

Little Beach

Cabbage Throat



Legend

- Archeological Avoidance Areas
- Rutgers Submarine Cable (Letter)
- Proposed Borrow Area

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
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APR 13 2016

Peter R. Blum, Chief
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RE: Draft Environmental Assessment for the Little Egg Harbor Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, NJ

Dear Mr. Blum:

We have reviewed the draft Environmental Assessment (DEA) for the Little Egg Inlet Sand Resource Borrow Area Investigation and the essential fish habitat (EFH) assessment contained within the DEA. The DEA tiers off the 1999 New Jersey Shore Protection Study's Final Feasibility Report and Integrated Environmental Impact Statement (EIS) for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project. The storm damage reduction project involves beach nourishment along the 17-mile stretch of Long Beach Island's (LBI) Atlantic coastline between the Barnegat Inlet and Little Egg Inlet. The 1999 EIS identified several potential offshore sand borrow areas to obtain the 8.5 million cubic yards (mcy) of sand needed for the initial construction of the project and the approximately 2.0 mcy needed every seven years for periodic renourishment. Two of the borrow areas (B and E) originally proposed for use have been eliminated from further consideration due to environmental concerns. Other borrow areas (D1 and D2) do not have sufficient quantities of sand over the 50-year life of the project, for future emergency nourishments, or have other logistical issues. As a result, a new 3,288-acre sand borrow area within the Little Egg Inlet is being proposed. We provided pre-consultation, technical assistance to you on the potential use of this site our letter dated April 4, 2013.

The Fish and Wildlife Coordination Act (FWCA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) require federal agencies to consult with one another on projects such as this that may affect EFH and other aquatic resources. Because this project affects EFH, this process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments, lists the required contents of EFH assessments, and generally outlines each agency's obligations in this consultation procedure.

Fish and Wildlife Coordination Act

Little Egg Inlet provides access to the Little Egg Harbor-Great Bay complex for many aquatic species including both state and federally managed species and their forage including bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*),



black sea bass (*Centropristis striata*), Atlantic butterfish (*Peprilus triacanthus*), winter flounder (*Pseudopleuronectes americanus*), windowpane flounder (*Scophthalmus aquosus*), weakfish (*Cyanoscion regalis*), striped bass (*Morone saxatilis*), tautog (*Tautoga onitis*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), killifish (*Fundulus spp.*), Atlantic silversides (*Menidia menidia*), bay anchovies (*Anchoa mitchilli*) and other assorted baitfishes and shrimps (e.g., *Neomysis americana*, *Mysidopsis bigelowi*).

Anadromous species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass transit the inlet to reach spawning and nursery habitat in the Mullica River and its tributaries including Bass River, Nacote Creek, Wading River, and Oswego River, as well as the tributaries to Little Egg Harbor Bay such as Tuckerton Creek, Mill Creek, and Willis Creek. The New Jersey Department of Environmental Protection's (NJDEP) Bureau of Freshwater Fisheries has confirmed spawning runs of alewife and blueback herring, collectively known as river herring, in these waterways (NJDEP 2005). Alewife and blueback herring spend most of their adult life at sea, but return to freshwater areas to spawn in the spring. Both species are believed to be repeat spawners, generally returning to their natal rivers (Collette and Klein-MacPhee 2002). In the Mid-Atlantic, landings have declined dramatically since the mid-1960s and have remained very low in recent years (ASMFC 2007). Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in alewife and blueback herring populations throughout much of their range since the mid-1960's, river herring have been designated as Species of Concern by NOAA. Species of Concern are those species about which we have concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act (ESA). We wish to draw proactive attention and conservation action to these species.

Catadromous American eel (*Anguilla rostrata*) spawn in the Sargasso Sea and transit the inlet as elvers to the freshwater habitats in tributaries to the bay. They inhabit these freshwater areas until they return to the sea through the Little Egg Inlet as adults. According to the 2012 benchmark stock assessment, the American eel population is depleted in U.S. waters. The stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, toxins and contaminants, and disease (ASMFC 2012). The Little Egg Inlet also supports a strong recreational fishing presence from April to June for striped bass and weakfish. In order to minimize the adverse effects on anadromous and catadromous species, we recommend dredging within the inlet be avoided from March 1 through June 30 to avoid impeding the migration of these species into the inlet and to their upstream their habitats.

As stated in our previous letter, adult female blue crabs overwinter at the mouths of New Jersey inlets, generally November through April so they are in position to release their eggs in spring in a location that will allow their eggs to be carried into the ocean. The crabs burrow into surficial sediments as water temperature declines and overwinter in a dormant, immobile state until water temperature rise above approximately 10 degrees C in the spring. Steimle et al. (2000) has

documented that juvenile blue crabs are a food source for several state and federally managed fish species including winter flounder, little skate (*Leucoraja erinacea*), winter skate (*Leucoraja ocellata*), scup, and summer flounder. The DEA does not include any site specific sampling to determine if blue crabs overwinter within the borrow area. Recent benthic sampling done for this project was undertaken in July 2013. Blue crabs are not expected to be in the borrow area during the summer. Until additional surveys are done to determine the use of the borrow area by overwintering blue crabs, dredging should be avoided between December 1 and April 15. This recommendation can be revisited once additional site specific data are provided.

From the information provided in the DEA, it appears that portion of the borrow site provides habitat for surf clams (*Spisula solidissima*) although the document does not provide information of the specific densities of clams through the borrow site. We understand that only portions of the 3,288-acre site will be dredged to obtain sand, but the DEA does not include any details or maps of the areas to be dredged. As a result, it is not possible to determine if the areas that will be dredged contain high densities of surf clams. To ensure impacts to surf clams are minimized, the borrow area should be surveyed for surf clams prior to each dredging cycle and areas of high surf clam densities should be avoided. Copies of the surf clam survey results should also be provided to us prior to any dredging in the borrow area.

The land on both sides of the inlet is part of the U.S. Fish and Wildlife Service's Edwin B. Forsythe National Wildlife Refuge (Refuge). The DEA does not adequately evaluate the potential effects that the removal of sand from the inlet's ebb shoal will have on the shorelines of the Refuge. In particular, we are concerned that the removal of sand from the ebb shoal will result in the loss of beach areas and wetlands down drift of the inlet along Little Beach Island. The Corps should coordinate with USFWS and the U.S Geological Survey on the information and assumptions used by the U.S. Army Engineering and Research Center (ERDC) to develop the model of the shoreline changes that could result from this project to ensure that using the Little Egg Inlet as a sand borrow area does not affect the Refuge adversely or increase beach or wetland loss around the inlet.

Magnuson Stevens Fishery Conservation and Management Act (MSA)

The Little Egg Inlet has been designated as EFH for a variety of life stages of federally managed species including, Atlantic butterfish, Atlantic cod (*Gadus morhua*), black sea bass, monkfish (*Lophius americanus*) red hake (*Urophycis chuss*), scup, summer flounder, winter flounder, windowpane flounder (*Scophthalmus aquosus*), witch flounder (*Glyptocephalus cynoglossus*), yellowtail flounder (*Limanda ferruginea*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculates*), cobia (*Rachycentron canadum*), clearnose skate (*Raja eglanteria*), little skate, winter skate, and others.

EFH for highly migratory species designated in the area includes: bluefin tuna (*Thunnus thynnus*), dusky shark (*Carcharhinus obscurus*), sandbar shark (*Carcharhinus plumbeus*), sand tiger shark (*Odontaspis taurus*), scalloped hammerhead shark (*Sphyrna lewini*), smooth dogfish (*Mustelus canis*), and tiger shark (*Galeocerdo cuvieri*). Sand tiger and dusky sharks have been listed as Species of Concern by NOAA. The mouth of Little Egg Inlet and Great Bay has been

designated as a Habitat Area of Particular Concern (HAPC) for sandbar shark.

The EFH assessment included in the DEA evaluates some of the impacts to EFH that will result from the removal of sand for the ebb shoal at the mouth of the Little Egg Inlet. However, neither the DEA nor the EFH assessment includes details on how much of the 3,288-acre borrow area will be dredged during each dredging cycle and how often this dredging will occur. Also lacking are data on the use of the borrow area by overwintering blue crabs and the densities of surf clams throughout the site. Based upon the information provided, adverse impacts to EFH and federally managed species will occur as a result of use of the Little Egg Inlet as a sand borrow area. The adverse impacts to EFH can be minimized through the future site assessments, borrow area management strategies and seasonal resources protections.

As stated in our previous letter, the dredging of sand for beach nourishment has the potential to impact aquatic resources and their habitats in a variety of ways. Dredging can damage fishery resources and their habitats through direct impingement of eggs and larvae, through the creation of undesirable suspended sediment levels in the water column, and through deposition of sediments on immobile eggs and early life stages. Such suspended sediment levels can also reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and newly-settled juvenile demersal fish. Sustained water column turbulence can reduce the feeding success of sight-feeding fish such as winter flounder, tautog, and summer flounder.

Dredging can also remove the substrate used by federally managed species as spawning, refuge and forage habitat. Benthic organisms that are food sources for federally managed species may also be removed during the dredging. These impacts may be temporary in nature if the substrate conditions return to preconstruction condition and benthic community recovers with the same or similar organisms. The impacts may be permanent if the substrate is altered in a way that reduces its suitability as habitat, if the benthic community is altered in a way that reduces its suitability as forage habitat or if the dredging occurs so often that the area does not have time to recover.

As stated above, the borrow area has been designated as an HAPC for sandbar shark. HAPCs are subsets of EFH identified based on one or more of the following considerations: 1) the importance of the ecological function, 2) extent to which the habitat is sensitive to human-induced degradation, 3) whether and to what extent, development activities are stressing the habitat type, or 4) rarity of habitat type (50 CFR 600.815(a)(8)). The EFH assessment does not evaluate fully the effect of the project on this HAPC or the sensitive life stages of sandbar shark. While we agree entrainment of sandbars shark early life stages is unlikely due to their size at birth, activities such as dredging (any method), barge overflow and the placement of dredged material in the aquatic environment including placement as beach nourishment may affect sandbar sharks and their EFH and HAPC adversely.

The June 2009 Amendment 1 to the Consolidated Highly Migratory Species (HMS) Fisheries Management Plan (NOAA 2009) states that mining for sand (e.g., for beach nourishment

projects), gravel, and shell stock in estuarine and coastal waters can result in water column effects by changing circulation patterns, increasing turbidity, and decreasing oxygen concentrations. The 2009 amendment also include a number of EFH conservation recommendations for dredging and beach nourishment projects proposed within EFH for highly migratory species. These general EFH conservation recommendations include:

- Sand mining and beach nourishment should not be allowed in HMS EFH during seasons when HMS are using the area, particularly during spawning and pupping seasons.
- Uncontaminated dredged material may be viewed as a potentially reusable resource if properly placed and beneficial uses of these materials should be investigated. Materials that are suitable for beach nourishment, marsh construction or other beneficial purposes should be utilized for these purposes as long as the design of the project minimizes impacts on HMS EFH.
- Sand and gravel extraction operations should be managed to avoid or minimize impacts to the bathymetric structure in estuarine and nearshore areas.
- An integrated environmental assessment, management, and monitoring program should be a part of any gravel or sand extraction operation, and encouraged at Federal and state levels.
- Planning and design of mining activities should avoid significant resource areas important as HMS EFH.
- Given the increase in sea level rise and potentially growing need to re-nourish beaches, this activity needs to be closely monitored in areas that are adjacent to or located in HMS EFH.

In the case of Little Egg Inlet and Great Bay, pregnant sandbar shark females occur in the area between late spring and early summer, give birth and depart shortly after while neonates (young of the year) and juveniles (ages one and over) occupy the nursery grounds until migration to warmer waters in the fall (Rechisky and Wetherbee 2003 and Springer 1960). Neonates return to their natal grounds as juveniles and remain there for the summer. To minimize adverse effects to sandbar sharks, dredging should be avoided from May 1 to September 15 when sandbar sharks use the area as an important pupping and nursery ground.

Able *et al.* (1990) reported that transforming summer flounder larvae have been collected in most of the major inlets along the New Jersey coast including Shark River Inlet, Manasquan River Inlet, Little Egg Inlet, Absecon Inlet, Corson Inlet and the Maurice River. The movement of transforming individuals through inlets in New Jersey occurs primarily from October through December, but larvae have been collected as late as February in Little Sheepshead Creek inside Little Egg Inlet, March and May in the Maurice River, March in the Manasquan River Inlet and Corson Inlet and March and April in Absecon Inlet (Able *et al.* 1990). Festa (1974) also studied

the distribution of young and larval summer flounder in New Jersey estuaries, and found that larvae enter New Jersey estuaries from at least early October to late January in most years and as late as March in certain years. Since these life stages are not capable of moving away from a dredge, even those species that are pelagic can be entrained in the dredge if the suction is on while the dredge head is moving through the water column. Entrainment of early life stages of summer flounder and other species can be reduced by ensuring that the suction on the dredge is not turned on until the dredge head is at or near the bottom and that it is turned off before the head is lifted up through the water column when dredging ceases.

Winter flounder also transit the inlet to reach spawning areas within the estuarine portions of the Great Bay and Little Egg Harbor Bay when water temperatures begin to drop in the fall. Tagging studies show that most return repeatedly to the same spawning grounds (Lobell 1939, Saila 1961, Grove 1982 in Collette and Klein -MacPhee 2002). They typically spawn in the winter and early spring although the exact timing is temperature dependent and thus varies with latitude (Able and Fahay 1998), but movements into these spawning areas occurs earlier, generally from mid-to late November through December (B. Phelan personal communication, January 13, 2014). Winter flounder have demersal eggs that sink and remain on the bottom until they hatch. After hatching, the larvae are initially planktonic, but following metamorphosis they assume an epibenthic existence. Winter flounder larvae are negatively buoyant (Pereira et al. 1999), and are typically more abundant near the bottom (Able and Fahay 1998). To minimize impacts to winter flounder early life stages and their EFH, we recommend that activities be avoided from January 1 to May 31 of each year in areas that have been designated as EFH for winter flounder early life stages.

The use of the Little Egg Inlet as a borrow area for sand can also affect EFH adversely through impacts to prey species. The EFH final rule states that the loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat and the definition of EFH includes waters and substrate necessary to fish for feeding. Therefore, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH.

Stemile et al. (2000) report that winter flounder diets include the siphons of surf clams. Buckel and Conover (1997) in Fahey et al. (1999) reports that diet items of juvenile bluefish include anadromous species. As a result, activities that adversely affect surf clams or impact spawning success and the quality for the nursery habitat of anadromous fish can adversely affect the EFH for winter flounder and juvenile bluefish by reducing the availability of prey items. Additionally, water quality degradation, increased turbidity, noise and vibrations from dredging operations may impede the migration of anadromous fish through the inlets to their upstream spawning grounds.

Over the 50-year life of the project, the EFH in the project area will be adversely affected numerous times as each dredging and beach nourishment event occurs. Currently, there is no mechanism for reporting of acres affected annually or notification to us when construction

commences for each project segment or cycle. EFH designations may be modified, the status of a species' stock may change in a manner that warrants additional management measures, or other new information may become available that may change the basis of our EFH conservation recommendations during the life of this project. To ensure that we meet our joint responsibilities to protect, conserve and enhance EFH and minimize adverse effects to living marine resources and their habitats, you should notify us prior to the commencement of each dredging event so that we may confirm that the EFH determinations and EFH conservation recommendations remain valid and a full reinitiation of the EFH consultation is not required. This notification should be done prior to the solicitation of bids for the contract so sufficient time is allowed for any recommended modifications to be included in the bid documents. It should also include the location of the segment to be nourished, the borrow area to be used, volumes of sand to be dredged, depth of sand to be removed, results of the surf clam survey, and the boundaries of the dredging within the borrow area.

The Mid-Atlantic Fisheries Management Council (MAFMC) has developed a policy statement on beach nourishment activities that may affect federally managed species under their purview including summer flounder, scup, black sea bass, monkfish and butterfish. These policies are intended to articulate the MAFMC's position on various development activities and facilitate the protection and restoration of fisheries habitat and ecosystem function. The MAFMC's policies on beach nourishment are:

1. Avoid sand mining in areas containing sensitive fish habitats (e.g., spawning and feeding sites, hard bottom, cobble/gravel substrate, shellfish beds).
2. Avoid mining sand from sandy ridges, lumps, shoals, and rises that are named on maps. The naming of these is often the result of the area being an important fishing ground.
3. Existing sand borrow sites should be used to the extent possible. Mining sand from new areas introduces additional impacts.
4. Conduct beach nourishment during the winter and early spring, when productivity for benthic infauna is at a minimum.
5. Seasonal restrictions and spatial buffers on sand mining should be used to limit negative impacts during fish spawning, egg development, young-of-year development, and migration periods, and to avoid secondary impacts to sensitive habitat areas such as SAV.
6. Preserve, enhance, or create beach dune and native dune vegetation in order to provide natural beach habitat and reduce the need for nourishment.
7. Each beach nourishment activity should be treated as a new activity (i.e., subject to review and comment), including those identified under a programmatic environmental assessment or environmental impact statement.

8. Bathymetric and biological monitoring should be conducted before and after beach nourishment to assess recovery in beach borrow and nourishment areas.

9. The effect of noise from mining operations on the feeding, reproduction, and migratory behavior of marine mammals and finfish should be assessed.

10. The cost effectiveness and efficacy of investments in traditional beach nourishment projects should be evaluated and consider alternative investments such as non-structural responses and relocation of vulnerable infrastructure given projections of sea level rise and extreme weather events.

In addition to the EFH conservation recommendations provided below, the MAMFC's policies should be incorporated in the final design of this project and its long-term management plan.

Essential Fish Habitat Conservation Recommendations

Pursuant to Section 305 (b) (4) (A) of the MSA, we recommend the following EFH conservation recommendations be incorporated into the project:

1. To maintain access to the estuarine areas of EFH for summer flounder, winter flounder, bluefish and other managed species and their prey species, and to protect sandbar shark pupping and nurse habitat, dredging in borrow area should be avoided from December 1 to September 15. At other times of the year, at least 50% of the channel should remain open to allow the ingress and egress of aquatic species.
2. The intakes on the dredge plant should not be turned on until the dredge head is at or near the bottom and it should be turned off before lifted to minimize larvae entrained in the dredge.
3. Borrow areas should be surveyed for surf clams prior to use and areas of high surf clam densities within each borrow area should be avoided.
4. Notification and reinitiation of the EFH consultation should be undertaken prior to commencement of each dredging event

Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305 (b) (4) (B) of the MSA also indicates that you must explain its reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920 (k). Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the

above EFH conservation recommendations.

Overall, the dredging of the ebb shoal is environmentally preferable to removing offshore sand ridges, but because a wide variety of resources transit the inlet at various times of the year and the area's importance as a nursery and pupping ground for sandbar shark, seasonal dredging restrictions are necessary. We recognize that the seasonal restrictions recommended above limit dredging within the inlet and the borrow area to 2 ½ months per year. This is a conservative restriction based on a lack of site specific information. Additional surveys of the project area, including a survey to assess the use of the inlet and borrow area by overwintering blue crabs could result in the refinement of our EFH conservation recommendations and a reduction in the seasonal dredging restrictions. We recommend that a meeting be arranged between our offices and include fisheries staff from the New Jersey Department of Environmental Protection and USFWS to discuss needed surveys and monitoring, management strategies for the borrow area, and potential options to refine the seasonal dredging restrictions. We look forward to continued coordination with your office on this project as it moves forward. As always, we are available to meet with you to discuss our recommendations and the information that would be needed for us to reevaluate some of the seasonal resource protections listed above. If you have any questions or need additional information, please do not hesitate to contact Karen Greene at karen.greene@noaa.gov or (732) 872-3023.

Sincerely,



Louis A. Chiarella,
Assistant Regional Administrator
for Habitat Conservation

cc: NJDEP – Land Use – K. Turner
Bureau of Shellfisheries – J. Normant
Marine Fisheries – B. Muffley
FWS- Pleasantville- E. Schradig, V. Rettig
EPA – Region II – D. Montella
MAFMC – C. Moore
NEFMC – T. Nies
GARFO – Z. Jylkka, K. Chu
Corps – B. Conlin, K. Watson

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DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

21 April 2016

Louis A. Chiarella
Assistant Regional Administrator
For Habitat Conservation
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mr. Chiarella:

We are in receipt of your 13 April 2016 letter commenting on the draft Environmental Assessment (EA) for the Little Egg Inlet Sand Resource Borrow Area Investigation and essential fish habitat (EFH) assessment.

Pursuant to Section 305 (b)(4)(B) of the MSA, this letter serves to provide you with detailed written responses to your EFH conservation recommendations. The draft EA has been revised to incorporate the additional information received from your agency as well as from the U.S. Fish and Wildlife Service. More site specific information pertaining to the proposed dredging plan has also been added to the EA. Additionally, the borrow area has been modified and reduced in size to address the concerns raised for potential impacts to the inlet shorelines. The revised EA will be forwarded to you shortly, once it is completed.

Thank you for your review comments. Please refer to the attachment for our direct responses. We look forward to continuing our coordination with your office as this project moves forward. If you have any questions, please contact Ms. Barbara Conlin (215-656-6557) or Mr. Keith Watson (215-656-6287).

Encl


PETER R. BLUM, P.E.
Chief, Planning Division

cc: C. Keller, NJDEP
E. Schradung, USFWS

USACE Responses to NMFS letter dated 13 April 2016

NMFS Comment: Anadromous fish species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass transit the inlet to reach spawning and nursery habitat....Catadromous American eel (*Anguilla rostrata*) spawn in the Sargasso Sea and transit the inlet as elvers to the freshwater habitats in tributaries to the bay.

USACE Response: Noted. This information has been added to the EA's Existing Conditions Section. Section 4.2.4.3 of the draft EA presents data and discussion of potential impacts to fish species from plumes generated by a hydraulic cutterhead suction dredge, potential impacts of dredging turbidity plumes on fish migration and Section 4.2.2 presents data available on sound impacts to marine species.

NMFS Comment: In order to minimize the adverse effects on anadromous and catadromous species, we recommend dredging within the inlet be avoided from March 1 through June 30.

USACE Response: Language has been added to the EA to more specifically describe the intended location of the proposed initial dredging and methodology. The proposed dredging location, at its closest point to the shoreline, is 0.37 miles and extends out to about 2 miles just slightly north of the mouth of the inlet in front of the south end of the Holgate spit. Due to concerns raised by the natural resource agencies, the proposed borrow area was reduced in size to 2050 acres to eliminate the portion that was located within the inlet. A figure (Figure 4-1) was added to the EA to illustrate the revised borrow area boundaries and the location of the proposed dredging (northern alignment). No dredging will occur within the inlet.

NMFS Comment: The DEA does not include any site specific sampling to determine if blue crabs overwinter within the borrow area. Recent benthic sampling done for this project was undertaken in July 2013. Blue crabs are not expected to be in the borrow area during the summer. Until additional surveys are done to determine the use of the borrow area by overwintering blue crabs, dredging should be avoided between December 1 and April 15th.

USACE Response: The current contract for dredging is scheduled to begin this month (April) and be concluded by June for the proposed borrow area and therefore, would not occur during the period that blue crabs are likely to occur in the proposed borrow area. This schedule may be delayed 1-2 months. To dredge approximately 2 million cubic yards, a 4-month window is necessary, due to the potential for weather delays or equipment malfunctions and repair time. Mobilization can take 30 days. Based on NMFS's recommended environmental window periods to avoid dredging for potential impacts to American eel, striped bass, weakfish, sandbar shark, blue crabs, summer flounder, and winter flounder, only a two week period for dredging would occur in the latter part of the month of April and a two week period in the later part of the month of September. Your letter also advises that the Mid-Atlantic Fisheries Management Council's (MAFMC) policies should be incorporated in the final design of the project. Adding in MAFMC's recommendation eliminates the two weeks in April, leaving only a two week period in September to dredge. The proposed dredging of approximately 2 million cubic yards of sand from the Little Egg Inlet borrow area will require about 4 months. The Corps strives to avoid impacts to all natural resources in scheduling beachfill projects by following reasonable and prudent conservation measures to the maximum extent possible. The EA provides supporting documentation for our position that the proposed dredging project is not likely to adversely affect marine species of special concern.

NMFS Comment: From the information provided in the DEA, it appears that portion of the borrow site provides habitat for surf clams (*Spisula solidissima*) although the document does not provide information of the specific densities of clams through the borrow site. We understand that only portions of the 3,288 acre site will be dredged to obtain sand, but the DEA does not include any details or maps of the areas to be dredged.

USACE Response: The EA was prepared to meet the requirements of the National Environmental Policy Act (NEPA) and other natural resources protective laws for the purpose of obtaining authorized use of the proposed borrow area for the LBI beachfill project. This includes the current proposed use for 2016 and possible future uses for the duration of the project life (until 2055). In such a dynamic environment, the inlet shoreline position and ebb shoals may change over time, as evidenced by the historical record (Appendix B), and the Corps needs flexibility within the revised delineated borrow area boundaries to select the best location for future possible dredging events based on changes in ebb shoal morphology. Any future scheduled dredging events would be coordinated with the natural resource agencies prior to award.

For the current contract, the draft EA describes the proposed dredging location being at its closest point to the shoreline 0.37 miles offshore (near the borrow area's boundary) and extending out to about 2 miles in a northern orientation, just slightly north of the mouth of the inlet in front of the south end of the Holgate spit. Due to concerns raised by the natural resource agencies, the proposed borrow area has been reduced in size to 2050 acres to eliminate the portion that was located within the inlet. A figure (Figure 4-1) was added to the EA to illustrate the revised borrow area boundaries and the location of the proposed dredging (northern alignment). No dredging will occur within the inlet.

For the benthic assessment undertaken in July 2014 for the LBI beachfill project (and described in Sections 3.2.4.2 and 4.2.3.2 of the draft EA), surf clams were collected within the borrow area boundaries in low numbers. Only 2 benthic sample sites (of 17 random benthic sampling locations) identified surfclams. Results of both these benthic samples and 20 surf clam trawls suggest that population densities are low and that a viable commercial fishery population does not exist within the borrow area.

NMFS Comment: The DEA does not adequately evaluate the potential effects that the removal of sand from the inlet's ebb shoal will have on the shorelines of the Refuge. In particular, we are concerned that the removal of sand from the ebb shoal will result in the loss of beach areas and wetlands downdrift of the inlet along Little Beach Island. The Corps should coordinate with USFWS and USGS on the information and assumptions used by the ERDC to develop the model of the shoreline changes that could result from this project to ensure that using the Little Egg Inlet as a sand borrow area does not affect the Refuge adversely or increase beach or wetland loss around the inlet.

USACE Response: Noted. Additional coordination with ERDC, USFWS, and USGS has taken place to provide responses to concerns raised during the draft EA review. Additional information has been added to the EA to address these concerns.

The Corps acknowledges the concern by resource agencies for how dredging may impact the shoreline habitat. Consequently, the Corps has revised the borrow area boundaries to remove the area located inside the inlet and will restrict all dredging to the areas seaward of the 0.37 mile distance offshore of

the Holgate spit shoreline. A revised figure has been added to the EA to show the proposed dredging locations.

The Holgate spit is expected to continue to grow southwest while Little Beach Island's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. An historical aerial photography perspective of Little Beach Island has been added to Appendix B of the EA to illustrate how Little Beach Island morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate these erosion processes occurring along the shoreline due to the continual southwest natural transport and placement operations 3-5 miles north of the inlet (developed part of Holgate and Beach Haven). See ERDC responses to USGS model evaluation comments.

NMFS Comment: The Little Egg Inlet has been designated as EFH for a variety of life stages of federally managed species including..... EFH for highly migratory species designated in the area includes....

USACE Response: Noted. The EFH assessment provided in the Existing Conditions section (3.2.4.4) of the draft EA has been updated to include additional information provided in your current letter regarding Essential Fish Habitat (EFH) species, Species of Concern (SOC) and Habitat Area of Particular Concern (HAPC). The draft EA provides data in the Environmental Effects section (4.2.3.4) regarding potential impacts to these species and habitats, and measures the Corps will take to minimize or avoid adversely affected EFH species or habitat. These proactive measures are standard practice for all Philadelphia District beachfill projects, such as avoiding areas of high surf clam densities, adhering to feasible seasonal dredging window restrictions, avoiding large turbidity plumes by dredging larger grain size sediments that settle more quickly so as to avoid long-term impacts to water quality, minimizing disruption to fish migration or site-feeding by eliminating portions of the borrow area located within the inlet, minimizing potential entrainment impacts to fish early life stages (*i.e.* eggs and larvae) by prohibiting suction of the cutterhead until it is at or near the bottom, and reducing the impact footprint to benthic (food) organisms by dredging a narrow configuration within a small section of the borrow area.

As the draft EA presents, the Corps anticipates impacts to benthic organisms are temporary and populations are expected to recover quickly as the species have evolved to do in high energy dynamic coastal environments. The draft EA also presents discussion on the minimal impacts expected to water quality, and water sound impacts to marine species.

NMFS Comment: The EFH assessment does not evaluate fully the effect of the project on this HAPC or the sensitive life stages of sandbar shark. While we agree entrainment of sandbar shark early life stages is unlikely due to their size at birth, activities such as dredging (any method), barge overflow, and the placement of dredged material in the aquatic environment including placement as beach nourishment may affect sandbar sharks and their EFH and HAPC adversely.

USACE Response: Noted. The draft EA states that Great Bay provides important nursery and pupping grounds for the sandbar shark (Section 3.2.4.4). Additional language has been added to Section 3.2.4.4: Great Bay averages about 5 feet in depth, and provides extensive areas of estuarine substratum covered with algae and vascular plant beds in areas shallower than 3 feet. Extensive

areas (3,355 acres) of intertidal sandflats and mudflats occur in this estuary, the result of the sediment load from the Mullica River and the movement of sand in through Little Egg Inlet.

Additional language has also been added to Section 4.2.3.4 to address potential impacts to sandbar sharks. The Corps recognizes that although larger sandbar sharks tend to occur in deeper waters and juveniles and adults can move away from the dredge equipment, the shallow areas within Great Bay are HAPC for this species and Little Egg Inlet provides access between the Atlantic Ocean and Great Bay/Mullica River estuary. The proposed dredging location is located sufficiently offshore (0.37 to 2.0 miles) and to the north of the inlet's throat that the likelihood of temporary elevated turbidity at the dredge is not likely to pose interference with fish migration in and out of the inlet. Turbidity plumes resulting from hydraulically dredging sand are localized and settle quickly-an hour or less (see EA Sections 4.2.1 and 4.2.4.2). The inlet throat at its minimal width is 4,200 feet wide between the southwest end of the Holgate spit and the northeast end of Little Beach Island, such that dredging offshore and to the north of the inlet will not impede fish migration. Given the current scour depths surpassing 42 feet in the inlet throat, it is likely that currents through the inlet are as high as 3 to 4 knots, making the inlet itself unlikely habitat for EFH species, and in particular neonate or juvenile sandbar sharks other than as a transit corridor between the Great Bay/Mullica River estuary and the Atlantic Ocean.

NMFS Comment: The June 2009 Amendment 1 to the Consolidated Highly Migratory Species (HMS) Fisheries Management Plan (NOAA 2009) states that mining for sand (e.g. for beach nourishment projects), gravel, and shell stock in estuarine and coastal waters can result in water column effects by changing circulation patterns, increasing turbidity, and decreasing oxygen concentrations.

USACE Response: the potential impacts of mining for sand for the proposed plan and potential impacts of changes to circulation patterns, increasing turbidity, and decreasing oxygen concentrations are addressed in the draft EA and the above comment responses.

NMFS Comment: The 2009 amendment also include a number of EFH conservation recommendations for dredging and beach nourishment projects proposed within EFH for highly migratory species. These general EFH conservation recommendations include:

- Sand mining and beach nourishment should not be allowed in HMS EFH during seasons when HMS are using the area, particularly during spawning and pupping seasons.

USACE Response: the EA presents the Corps' evaluation of potential impacts of sand mining on EFH and HMS and conclusions drawn regarding the degree of the potential impacts. Placement operations were evaluated in two previous NEPA documents (USACE, 1999; 2014).

- Uncontaminated dredged material may be viewed as potentially reuseable resource if properly placed and beneficial uses of these materials should be investigated. Materials that are suitable for beach nourishment, marsh creation or other beneficial purposes should be utilized for these purposes as long as the design of the project minimizes impacts on HMS EFH.

USACE Response: Concur. The proposed plan has been developed with the objective to minimize impacts to EFH. Placement operations for the LBI beachfill project were evaluated in two previous NEPA documents (USACE, 1999; 2014).

- Sand and gravel extraction operations should be managed to avoid or minimize impacts to the bathymetric structure in estuarine and nearshore areas.

USACE Response: the Holgate spit is expected to continue to grow southwest while Little Beach Island's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. An historical aerial photography perspective of both the Holgate spit, Little Beach Island and changes to the inlet are presented in Appendix B of the EA to illustrate how the area morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate erosion processes occurring along the shoreline due to the continual southwest natural transport. Ebb shoals outside of the inlet will continue to develop.

- An integrated environmental assessment, management, and monitoring program should be part of any gravel or sand extraction operation, and encouraged at Federal and state levels.

USACE Response: Concur. The environmental assessment has been developed. Management will occur during operations to ensure that all environmental protective measures are followed, and the Corps monitors sand movement for all beachfill projects annually.

- Planning and design of mining activities should avoid significant resource areas important to HMS EFH.

USACE Response: the EA presents the Corps' evaluation of potential impacts of sand mining on EFH and HMS and conclusions drawn regarding the degree of the potential impacts. See above EFH comment responses.

- Given the increase in sea level rise and potentially growing need to re-nourish beaches, this activity needs to be closely monitored in areas that are adjacent to or located in HMS EFH.

USACE Response: noted.

NMFS Comment: In the case of Little Egg Inlet and Great Bay, pregnant sandbar shark females occur in the area between late spring and early summer, give birth and depart shortly after while neonates (young of the year) and juveniles (ages one and over) occupy the nursery grounds until migration to warmer waters in the fall (Rechisky and Wetherbee 2003 and Springer 1960). Neonates return to the natal grounds as juveniles and remain there for the summer. To minimize adverse effects to sandbar sharks, dredging should be avoided from May 1 to September 15 when sandbar sharks use the area as an important pupping and nursery ground.

USACE Response: As noted in previous responses above, the dredging location is just outside of and to the north of the inlet mouth and at its closest point, 0.37 miles away from the inlet northern shoreline. The inlet throat at its minimal width is 4,200 feet wide and impacts to water quality are short-lived (see Sections 4.2.1; 4.2.3.2 and 4.2.3.4 of the EA). Additionally, the proposed borrow area is a highly dynamic ebb shoal region subject to waves and sand movement with continual shoaling and wave wash. As such, the proposed dredging location is not considered to have optimal habitat conditions for nursery or pupping grounds. The inlet serves as a migratory pathway for EFH species to reach optimal habitat within Great Bay and as noted in your letter, neonates and juveniles remain there for the summer. Dredging is not anticipated to pose adverse impacts to adult sharks nor impede migration through the inlet, offshore and north of the inlet.

NMFS Comment: Able *et al.* (1990) reported transforming summer flounder larvae have been collected in most of the major inlets along the New Jersey coast including Shark River, Manasquan River Inlet, Little Egg Inlet,The movement of transforming individual through inlets in New Jersey occurs primarily from October through December, but larvae have been collected as late as February in Little Sheepshead Creek inside Little Egg Inlet,... Festa (1974) also studied the distribution of young and larval summer flounder in New Jersey estuaries, and found that larvae enter New Jersey estuaries from at least early October to late January in most years and as late as March in certain years. Since these life stages are not capable of moving away from a dredge, even those species that are pelagic can be entrained in the dredge if the suction is on while the dredge head is moving through the water column. Entrainment of early life stages of summer flounder and other species can be reduced by ensuring that the suction on the dredge is not turned on until the dredge head is at or near the bottom and that it is turned off before the head is lifted up through the water column when dredging ceases.

USACE Response: Noted. As mentioned previously above, one of the proactive measures the Philadelphia District requires in its beachfill project contracts is prohibiting suction of the cutterhead until it is at or near the bottom.

NMFS Comment: Winter flounder also transit the inlet to reach spawning areas within the estuarine portions of the Great Bay and Little Egg Harbor bay when water temperatures begin to drop in the fall.movements into these spawning areas occurs earlier, generally from mid- to late November through December...to minimize impacts to winter flounder early life stages and their EFH, we recommend that activities be avoided from January 1 to May 31 of each year in areas that have been designated as EFH for winter flounder early life stages.

USACE Response: Noted. As mentioned previously above, the proposed dredging contract was scheduled to resume this month (April) and completed by June. The project is likely to be delayed 1-2 months.

NMFS Comment: The use of the Little Egg Inlet as a borrow area for sand can also effect EFH adversely through impact of prey species.

USACE Response: Noted. Potential impacts to prey species are evaluated in the draft EA in Sections 4.2.3.2; 4.2.3.4; 4.9; 4.11; 4.13, and 4.14.

NMFS Comment: As a result, activities that adversely affect surf clams or impact spawning success and the quality for the nursery habitat of anadromous fish can adversely affect the EFH for winter flounder and juvenile blue fish by reducing the availability of prey items. Additionally, water quality degradation, increased turbidity, noise and vibrations from dredging operations may impede the migration of anadromous fish through the inlets to their upstream spawning grounds.

USACE Response: The potential for impacts to fish species, EFH, turbidity, noise, and vibrations are presented and evaluated in Section 4.0 Environmental Effects subsections and are addressed in the above-presented comment responses. As noted in the draft EA: *"In the ERDC literature review of dredging impact studies on finfish (Reine, 2014), the conclusions drawn include: 1) plumes generated by hydraulic cutterhead suction dredge are too small to cause migratory blockage of anadromous fish into the inlet; 2) concentration levels at the cutterhead when dredging sandy sediment are less than 10 mg/l, which pose no harm to any estuarine fish species; and 3) maximum TSS concentration estimated at the open-water discharge site are at or below 100 mg/l and only within the immediate*

vicinity of the dredging operation (30 m) and are insufficient to cause any harmful effect unless the most sensitive of the anadromous fish species purposely spent 24 or more hours within the dredge plume. Based on the current state of knowledge, hydraulic pipeline dredging of sand is unlikely to cause any negative effect to any fish species in the project area."

NMFS Comment: Over the 50-year life of the project, the EFH in the project area will be adversely affected numerous times as each dredging and beach nourishment event occurs. Currently, there is no mechanism for reporting of acres affected annually or notification to us when construction commences for each project segment or cycle....To ensure that we meet our joint responsibilities to protect, conserve, and enhance EFH and minimize adverse effects to living marine resources and their habitats, you should notify us prior to the commencement of each dredging event so that we may confirm that the EFH determinations and EFH conservation recommendations remain valid and a full re-initiation of the EFH consultation is not required. This notification should be done prior to the solicitation of bids for the contract so sufficient time is allowed for any recommended modification to be included in the bid documents.

USACE Response: There are currently 39 years remaining in the project life; likely resulting in about 5 dredging events for periodic nourishment. The Corps, as a matter of practice, sends email notifications to the natural resource agencies prior to the known scheduled solicitation of bids date (usually 60 days). This allows for sufficient time for the Corps to coordinate with the Service agencies regarding the Magnuson Stevens Act and the Endangered Species Act prior to award.

NMFS Comment: The Mid-Atlantic Fisheries Management Council (MAFMC) has developed a policy statement on beach nourishment activities that may affect federally managed species under their purview...

1. Avoid sand mining in areas containing sensitive fish habitats (e.g. spawning and feeding sites, hard bottom, cobble/gravel substrate, and shellfish beds).

USACE Response: The proposed dredging location is sand and outside of and north of the inlet mouth. See previous comment responses above.

2. Avoid mining sand from sandy ridges, lumps, shoals, and rises that are named on maps. The naming of these is often the result of the area being an important fishing ground.

USACE Response: the proposed dredging area on the ebb shoals was selected for its self-replenishing character and proximity to the placement site. Infilling occurs rapidly due to the highly dynamic area and southerly longshore transport.

3. Existing sand borrow sites should be used to the extent possible. Mining sand from new areas introduces additional impacts.

USACE Response: see response #2 above. Existing authorized offshore borrow areas are also part of the proposed placement operations evaluated in the 1999 EIS and 2014 EA.

4. Conduct beach nourishment during the winter and early spring, when productivity for benthic infauna is at a minimum.

USACE Response: As mentioned previously above, the proposed dredging contract was scheduled to resume this month (April) and be completed by June, however, it is likely that it will be delayed 1-2 months. This recommendation is counter to the NMFS recommendations provided in this letter for American eel, striped bass, weakfish, summer flounder, sandbar shark and winter flounder. If the

dredging project were scheduled to avoid all stated NMFS and MAFMC environmental window recommendations, there would remain only a two week period in late September to dredge. The project will require approximately 4 months to complete.

5. Seasonal restrictions and spatial buffers on sand mining should be used to limit negative impacts during fish spawning, egg development, young-of-year development, and migration periods, and to avoid secondary impacts to sensitive habitat areas such as SAV.

USACE Response: these issues have all been addressed in the EA as well as in the above previous comment responses. No SAV beds occur within the proposed borrow area and no SAV beds within the shallow portions of Great Bay will be impacted by the proposed dredging offshore of the Holgate spit (see ERDC responses to USGS model evaluation comments pertaining to the potential for circulation impacts interior of the inlet).

6. Preserve, enhance, or create beach dune and native dune vegetation in order to provide natural beach habitat and reduce the need for nourishment.

USACE Response: Placement operations and dune grass planting has been evaluated in previous NEPA documents (USACE, 1999; 2014). The potential for impacts to dunes or vegetation along the shorelines closest to the proposed borrow area (Holgate and Little Beach Island) are evaluated in the current EA (2016). The Corps' position is that dunes and dune vegetation will not be adversely affected by the proposed dredging. This position is supported by the evaluation and data provided in the EA.

7. Each beach nourishment activity should be treated as a new activity (i.e. subject to review and comment), including those identified under a programmatic environmental assessment or environmental impact statement.

USACE Response: Noted. The Corps, as a matter of practice, sends email notifications to the natural resource agencies prior to the known scheduled solicitation of bids date (usually 60 days) for each dredging event. This allows for sufficient time for the Corps to coordinate with the Service agencies.

8. Bathymetric and biological monitoring should be conducted before and after beach nourishment to assess recovery in beach borrow and nourishment areas.

USACE Response: Noted. Numerous studies have been conducted over the past 25 years at both placement and borrow locations to assess biological recovery. The conclusions drawn from these studies indicate recovery to pre-dredging conditions within months to two years. Most indicate that dredging has only a temporary effect on infaunal communities and in some studies, differences in infaunal communities were attributed to seasonal variability or to hurricanes rather than to dredging. Some of these studies are presented in Section 4.2.3.2 of the draft EA. The Corps conducts annual surveys to assess the movement of sand from placement areas and monitors sand quantities in borrow areas prior to each dredging event.

9. The effect of noise from mining operations on the feeding, reproduction, and migratory behavior of marine mammals and finfish should be assessed.

USACE Response: Noted. See Section 4.2.2 of the draft EA.

10. The cost effectiveness and efficacy of investments in traditional beach nourishment projects should be evaluated and consider alternative investments such as non-structural responses and relocation of vulnerable infrastructure given projections given sea level rise and extreme weather events.

USACE Response: Noted. Cost evaluations for the project are addressed in the 1999 EIS. The 2014 and 2016 EAs address sea level rise.

NMFS Essential Fish Habitat Conservation Recommendations:

1. To maintain access to the estuarine areas of EFH...dredging in borrow area should be avoided from December 1 to September 15. At other times of the year, at least 50% of the channel should remain open to allow the ingress and egress of aquatic species.

USACE Response: Noted. The proposed dredging plan will require approximately 4 months to complete. The December 1 to September 15 exclusion period leaves just 2.5 months. The proposed dredging will not occur inside of Little Egg Inlet. The proposed dredging location is located 0.37 to 2.0 miles offshore on the ebb shoals and slightly to the north of Little Egg Inlet such that 100% of the inlet will remain open to allow the ingress and egress of aquatic species.

The inlet throat at its minimal width is 4,200 feet wide between the southwest end of the Holgate spit and the northeast end of Little Beach Island, such that the proposed dredging location will not impede fish migration. Depths through the inlet on the southern (scour) side are more than 42 feet.

2. The intakes on the dredge plan should not be turned on until the dredge head is at or near the bottom and it should be turned off before lifted to minimize larvae entrained in the dredge.

USACE Response: As noted twice above, one of the proactive measures the Philadelphia District requires in its beachfill project contracts is prohibiting suction of the cutterhead until it is at or near the bottom.

3. Borrow areas should be surveyed for surf clams prior to use and areas of high surf clam densities within each borrow area should be avoided.

USACE Response: As was previously noted above, a benthic assessment was undertaken in July 2014 for the proposed project (and described in Sections 3.2.4.2 and 4.2.3.2 of the draft EA). Surf clams were collected within the borrow area boundaries in low numbers. Only 2 benthic sample sites (of 17 random benthic sampling locations) identified surfclams. Results of both these benthic samples and 20 surf clam trawls suggest that population densities are low and that a viable commercial fishery population does not exist within the borrow area.

4. Notification and re-initiation of the EFH consultation should be undertaken prior to commencement of each dredging event.

USACE Response: The Corps will consult with NMFS prior to the commencement of each dredging event.

NMFS Comment: Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH.

USACE Response: Noted. In addition to modifications made to the draft EA to address these concerns to EFH, the Corps will provide the above responses in a letter to the NMFS. The above responses demonstrate adherence to the EFH Conservation Recommendations to avoid impacts.

NMFS Comment: Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305 (b)(4)(B) of the MSA also indicates that you must explain its reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920 (k).

USACE Response: Noted. The draft EA presents the scientific justification for the Corps' position that the proposed plan to dredge sand from the Little Egg Inlet is not likely to adversely affect EFH or other marine species. Section 4.2.3.4 presents a discussion specific to EFH within the Little Egg Inlet and surrounding vicinity. Additionally, these comment responses have been provided to NMFS by letter.

NMFS Comment: Overall, the dredging of the ebb shoal is environmentally preferable to removing offshore sand ridges, but because a wide variety of resources transit the inlet at various times of the year, and the area's importance as a nursery and pupping ground for sandbar shark, seasonal dredging restrictions are necessary.... We recommend that a meeting be arranged between our offices and include fisheries staff from the New Jersey Department of Environmental Protection and USFWS to discuss needed surveys and monitoring, management strategies for the borrow area, and potential options to refine the seasonal dredging restrictions.

USACE Response: Noted. The Corps can participate in meetings with the above-listed agencies to discuss potential advisory strategies for utilizing the proposed Little Egg Inlet borrow area for the duration of the project life for placement on Long Beach Island.



Jacques Cousteau National Estuarine Research Reserve
Coastal Education Center
130 Great Bay Blvd • Tuckerton, NJ 08087
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April 22, 2016

Environmental Resources Branch, Philadelphia
District, U.S. Army Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelphia, PA 19107
Attn: Public Affairs Office at pdpa-nap@usace.army.mil

To Whom It May Concern,

We are writing to address areas of potential concern and environmental impact that may result from the "Little Egg Inlet Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project (Ocean County, New Jersey)." The project area is entirely within the boundary of the Jacques Cousteau National Estuarine Research Reserve (JC NERR), one of 28 national reserves designated to protect and study estuarine systems across the country. Established through the Coastal Zone Management Act, the reserve system represents a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and coastal states. The JC NERR is regarded as one of the least disturbed estuaries in the northeastern United States and is comprised of a patchwork of federal and state protected lands, including many areas located within and adjacent to the proposed project site.

The proposed project may impact the Holgate and the Little Beach areas of the Forsythe National Wildlife Refuge, locations that are essential habitats for species that are protected under state and federal regulations. Specifically, this location supports the second highest piping plover nesting area in the state. Additionally, this area represents the only undredged channel between Montauk, NY and Assawoman, VA. The high quality habitat and minimal human disturbance of the JC NERR area were key attributes that enabled establishment of the reserve. The proposed project may alter habitat and water quality that make this one of the least disturbed estuarine systems in the northeast, reduce its value as a long-term study site, and compromise the resources that rely on reserve habitat as well as alter the ecosystem services provided to area communities.

Finally, the proposed site coincides exactly with a buried submarine cable that had been operated by Rutgers University. The cable runs 3 miles offshore, is wholly contained within the boundary of the JC NERR, and has been used to support research on the structure and function of coastal systems to important coastal resources and processes

We believe these are important considerations that need to be addressed before any dredging occurs, and will be pleased to provide additional detail at your convenience

Sincerely

A handwritten signature in cursive script that reads "Michael P. De Luca".

Michael P. De Luca
Manager

A handwritten signature in cursive script that reads "Lisa M. Auermuller".

Lisa Auermuller
Watershed Coordinator

April 22, 2016

Environmental Resources Branch
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA. 19107-3390
pdpa-nap@usace.army.mil

RE: Public Comment
Draft Environmental Assessment for the Little Egg Inlet
Sand Resource Borrow Area Investigation for the Barnegat Inlet to Little Egg Inlet
Storm Damage Reduction Project, Ocean County, New Jersey

To Whom It May Concern:

I am writing to comment on the Draft Environmental Assessment for the Little Egg Inlet Sand Resource Burrow Area Investigation for the Barnegat Inlet to Little Egg Inlet (Long Beach Island) Storm Damage Reduction Project, Ocean County, NJ. I write as Director of the Rutgers University Marine Field Station. I and my colleagues are intimately familiar with the area in question having conducted research in Little Egg Inlet, Beach Haven Ridge immediately offshore, and throughout Great Bay and Little Egg Harbor over the last 30 years.

My comment is simple, but I think compelling. Little Egg Inlet is the only inlet within New Jersey that is unaltered by dredging and other human activities. In addition, this inlet is surrounded by a federally managed, natural wildlife area as part of the Forsythe National Wildlife Management Area. As such, it offers an exceptional opportunity to determine how an unaltered inlet responds to natural events such as hurricanes, nor'easters, sea level rise, etc. Once it is altered, we (the research community and the public) lose this sentinel site for all time.

For this reason, I recommend this proposed project not be allowed to go forward.

Sincerely,



Dr. Kenneth Able, Distinguished Professor and Director

COMMENTS AND RESPONSES

Draft Environmental Assessment – Little Egg Inlet Sand Resource Borrow Area Investigation

Barnegat Inlet to Little Egg Inlet (Long Beach Island)

Storm Damage Reduction Project, Ocean County, New Jersey

USACE Responses to USEPA letter dated 29 February 2016

EPA Comment: EPA finds that the EA supports a finding of no significant impact. However, EPA reminds the Corps that all construction emissions for this project, as determined in the emissions inventory developed in the Final Environmental Assessment, Barnegat Inlet to Little Egg Inlet (Long Beach Island, New Jersey Storm Damage Reduction Project, 2014, must be offset if they are above the *deminimus* levels set forth under the General Conformity Rule (Clean Air Act Section 176 (c) (4)).

USACE Response: Concur. The ongoing project is operating under a Statement of Conformity (SOC) which means that project emissions will be offset completely, on a calendar year basis (USACE, 2014). The SOC is coordinated with state and federal regulators and the project will conform with the State Implementation Plan (SIP), and, therefore not lead to any new violations of the National Ambient Air Quality Standards (NAAQS). Sections 3.5 and 4.5 and Appendix F of the EA.

EPA Comment: Also, EPA encourages the Corps to incorporate the effects of greenhouse gas (GHG) emissions and climate change in its NEPA review process. In this case, we suggest that the Little Egg Inlet Sand Resource Borrow Investigation, and any subsequent documents for the Barnegat Inlet to Little Egg Inlet Reach consider GHG emissions that would result from construction associated with fill or beach stabilization. Such valuation may be used as a proxy for assessing a proposed action's potential climate change impacts. EPA recommends that the draft environmental assessment also include an analysis of practicable mitigation measures to reduce GHG emissions.

USACE Response: USACE Response: GHG consideration based on the Council on Environmental Quality's December 2014 revised draft guidance was incorporated into the EA as a framework to evaluate the proposed project in terms of its GHG emissions and its effects on climate change. GHG emissions have been estimated and added to the EA. A discussion is provided in the EA to address the proposed project relative to the potential effects of climate change on the surrounding area. The project itself is in part an adaptive measure designed to protect against the long-term effects of climate change, particularly increased storm intensity and higher mean sea levels. While the project is anticipated to exceed the 25,000 metric tons CO₂e CEQ 2014 indicator level, the project will not introduce a new mid nor long-term source of GHG production, in fact, it will help reduced GHGs. The very nature of the LBI beachfill project is to enhance the resiliency of the coastline by constructing dunes and a beach berm to combat rising sea levels, erosion and flood damages to infrastructure. The project includes the planting of beachgrass (347 acres) to restore vegetation lost through erosion, which will contribute to carbon sequestering and dune structural resiliency during storms. The

protection of the ecosystem provided by the beachfill project will enable it to continue to sequester carbon through sustainable vegetation growth as a result of the project and will minimize future storm damage further inland and associated reconstruction emissions. Therefore, it is anticipated that the project will have a net-benefit long-term local impact related to climate change.

USACE Responses to the Borough of Surf City Letter dated 13 March 2016

Borough Comment: I am writing on behalf of the people of the Borough of Surf City in order to submit public comment in support of the above noted project to dredge the Little Egg Harbor Inlet as an appropriate source of sand for the Long Beach Island Storm Damage Reduction Project.

USACE Response: No response required.

USACE Responses to Rutgers Marine Field Station Letter dated 15 March 2016

Rutgers Comment: In 1996 Rutgers University had installed a fiber optic cable from the Rutgers University Marine Field Station (RUMFS), located at the end of Great Bay Blvd. Tuckerton, New Jersey through Little Egg Inlet. The cable runs to two underwater Nodes (A&B) that comprise a Long-term Ecosystem Observatory, referred to as LEO-15. The Nodes are located in 12 & 15 meters of water and are approximately 8.1 and 9.8 kilometers respectfully from RUMFS. The cable was installed (buried) to a depth of 3 feet. A review of the above mentioned document and Figure 2-3 (page 16) indicates a potential conflict in that the proposed borrow area includes the burial area of the fiber optic cable for the undersea observatory.

USACE Response: Noted. The following has been added to the final EA in Section 4.9 Areas of Concern: “There is a fiber optic research cable buried within the Little Egg Inlet borrow area vicinity that will have a minimum of 500 foot buffer zones established on both sides where dredging is prohibited. The contractor will be required to contact the cable owner (*i.e.* Rutgers University Marine Field Station) to discuss the dredging work plan, obtain restrictions on the laying of submerged pipeline, anchoring and any other dredging operations around these cables.” Detailed coordinates and description will also be added to the Specifications”. A figure (Figure 4-1) has been added to the EA to delineate the cable’s location and buffers.

USACE Responses to Borough of Harvey Cedars Email dated 16 March 2016

Borough Comment: The Board of Commissioners of the Borough of Harvey Cedars strongly supports the use of the proposed Little Egg Inlet borrow area for use in the Long Beach Island Storm Reduction Project.

USACE Response: No response required.

USACE Responses to Township of Long Beach Letter dated 18 March 2016

Long Beach Township Comment: I am writing today in support of the use of Little Egg Inlet as a borrow area for the federal Long Beach Island storm damage reduction project.

USACE Response: No Response required.

USACE Responses to Barnegat Bay Partnership Letter dated 22 March 2016

BB Partnership Comment: While we generally agree with the findings in the Draft Environmental Assessment (EA) that the project as proposed will have limited adverse environmental impact on the aquatic community, we are concerned with the potential impact to adjacent shorelines that the project may have. The [ERDC Report] indicates that the potential dredging scenarios will not significantly impact the adjacent shorelines provided that “large volumes of sand move into Little Egg Inlet from Long Beach Island to the north.” However, the authors of the report make clear that while they *expect* that a large volume of sand will move into the Little Egg Inlet area “it is not known how long it will take for this to occur or what volume will be added.”

USACE Response: The USACE concurs that the time it takes for volume to be added in any given area cannot be predicted with any certainty. The draft EA presents several researcher estimates for the area. Further discussion has been added to Section 4.2.3 and in Appendix B on the historical record showing cycles of growth and decay of both the Long Beach Island southern (Holgate) spit and the opposing shoreline of Little Egg Inlet at Little Beach Island. A series of aerial photographs of both of these shorelines, dating back to 1874 in Appendix B demonstrates the morphological changes that have occurred in the area over the last 141 years.

Additionally, USACE beachfill projects are monitored after placement operations to evaluate sand replenishment needs and the movement from the project template through longshore transport processes. Transport quantities can vary somewhat over short periods of time depending on the effect of varying weather conditions on sand transport. Based upon the District's extensive beachfill project history and monitoring experience, the most applicable inlet to draw similarity conclusions for Little Egg Inlet would be Hereford Inlet, located south of Seven Mile Island (Avalon and Stone Harbor). Stone Harbor has been the recipient of numerous beachfills since initially constructed in 2003. Predominate longshore transport is to the south along Stone Harbor and beachfill for Stone Harbor is dredged from Hereford Inlet's authorized borrow area. Beachfill placed on Stone Harbor migrates south via dispersion and ultimately returns to Hereford inlet. This return of sediment contributes to the borrow area infilling rate. Three recent examples of Hereford Inlet's borrow area infilling include surveys from October 2010, December 2012 and August 2014 where 101%, 107% and 105% of the dredge material returned to the borrow area within 18-24 months. Understanding the magnitude of the quantity of sediment being placed along Long Beach Island (regardless if the source is from the offshore borrow areas D1/D2 or Little Egg Inlet,) an accelerated rate of sediment transport is highly expected into the Little Egg Inlet area. This influx of sediment is predicted to infill any dredged borrow area in time frames very similar to what has been observed at Hereford Inlet, significantly limiting any temporary minor impacts to waves or shoreline change.

For further explanation, please refer to ERDC's direct responses to the USGS evaluation of the modeling report (ERDC, 2016) provided below.

BB Partnership Comment: As described in the report, longshore transport under the initial model parameters did not behave in this manner, and a revised methodology to handle sand movement was required. While adjusting model methodology to better fit observed values is common practice, it is not clear if this alteration was done to bring the model into line with measured longshore transport values (which the report points out are difficult to measure) or to make the model behavior match what is assumed to occur in the field.

Furthermore, the authors point out other key limitations in the model, including its inability to take changes in the geomorphology of the inlet itself into account. In light of the constant state of change in the size and location of the inlet that Appendix B so comprehensively details, it would seem that the inlet's configuration would be a key parameter to include in a model. Unfortunately, there is no discussion of what effects a changing inlet would have on the determination of no significant impact.

USACE Response: GenCade does predict longshore transport of sand. However, the GenCade grid domain in the ERDC model did not extend to the location of the beach nourishment activities at LBI. The source term was added to the GenCade model to account for the impacts of these beach nourishments.

GenCade is a one-line model, and GenCade assumes that the beach (berm height and depth of closure) are the same within and outside of the model domain. Therefore, if there is a beach fill directly adjacent to the GenCade grid, the model would not "know" that a beach fill exists. A source term is the only way to include a beach fill that is not included in the domain. Adding a source term to represent a beach fill is a standard modeling practice. While we do not know for certain if additional sediment will be delivered to the inlet due to nourishment activities, it is a very reasonable assumption. When a large volume of sand is placed on a beach, it will disperse over time. In this case, transport is predominately to the south. Over time, this sand will eventually move south towards the inlet. Millions of cubic yards of sand have been placed in northern New Jersey. USACE New York District is seeing an increased volume of sand moving towards Sandy Hook, New Jersey. It is expected that a similar effect is/will be observed near Little Egg Inlet.

The modeling study did not consider changes in inlet cross-sectional area and friction. Since the proposed dredging locations are outside of the inlet and will not affect the limiting cross-sectional area of the inlet, nor the entrance channels into each inland bay, which would be the controlling cross-sections of a classical estuarine model, the modeling would be expected to show no change in the hydrodynamics of the inland bays.

For further explanation, please refer to ERDC's direct responses to the USGS evaluation of the modeling report (Frey *et al.*, 2015) provided below regarding the GenCade grid domain, the model's regional contour, added source terms, and bathymetry changes.

BB Partnership Comment: Lastly, while the EA mentions that sea level rise will impact both the No Action and Proposed alternatives, there is no mention of sea level rise in the ERDC report, even though it projects shoreline changes 33-years into the future. Because the shorelines affected by this project are wilderness areas within a National Wildlife Refuge, we strongly urge the Corps to resolve these issues prior to finalizing the EA.

USACE Response: Anticipated climate change impacts were not part of the ERDC modeling scope. Potential climate change effects on the project area are discussed in the EA. The Corps considers its beachfill projects as adaptive measures designed to protect shorelines against the long-term effects of climate change, particularly increased storm intensity and higher mean sea levels. For additional information, see the USACE responses above regarding Hereford Inlet and southwesterly longshore transport to the current project area.

USACE Responses to the U.S. Fish and Wildlife Service Letter dated 22 March 2016

USFWS Comment: During the March 1, 2016 conference call, the Service advised the Corps that Little Egg Inlet is not an authorized borrow area in the PBO and, therefore, the Service cannot provide a streamlined Tier 2 letter to the Corps.

USACE Response: Noted. Further coordination has been initiated and additional information provided to the Service and added to the EA in support of the Corps' position that proposed dredging is not likely to adversely affect Federally-listed species and their habitats along the shorelines of the Holgate, Little Beach Island Wilderness Areas, and state lands. Per coordination with the Service's endangered species coordinator Wendy Walsh (6 April 2016), the Corps has requested streamlined (Tier 2) formal consultation for the remaining placement operations and informal consultation for the proposed new borrow area addition.

USFWS Comment: The Corps did not request a conference with the Service on the proposed designation of critical habitat for the red knot within and in the vicinity of the study area as recommended by the Service in the PAR.

USACE Response: Noted. In coordination with your office (Endangered Species Coordinator Wendy Walsh, 6 April 2016) it was concluded that the Corps will request initiation of a conference when the Service has identified the areas proposed for designation for red knot critical habitat.

USFWS Comment: The Service's Edwin B. Forsythe National Wildlife Refuge (Forsythe NWR) recommends that the Corps divide the project area into sections. The potential impacts to natural resources at Forsythe NWR are different nearer the shoreline than farther into the ocean. Thus, the Corps might develop a preferred alternative that minimizes or eliminates land-based concerns of the Service.

USACE Response: The Corps recognizes the Service's concern for how dredging may impact the shoreline habitat. Consequently, the Corps has revised the borrow area boundaries to remove the area located inside the inlet and will restrict all dredging to the areas seaward of the 0.37 mile distance offshore of the Holgate spit shoreline. A revised figure has been added to the EA to show the proposed dredging location (northern alignment). Additional information has been added to the EA regarding an impact assessment study of piping plovers in Monmouth County.

Barring any catastrophic storms, the Holgate spit is expected to continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. A historical aerial photography

perspective of Little Beach Island has been added to Appendix B of the EA to illustrate how Little Beach Island morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate erosion processes occurring along the shoreline due to the continual southwest natural transport. After placement operations on the southern end of the LBI project area, it is likely that sand transport towards the Little Egg Inlet may increase. In such a dynamic environment, the inlet shorelines and position may change over time, as evidenced by the historical record and the Corps will need the flexibility within the delineated borrow area boundaries for future possible dredging events to select the best location within the borrow area boundaries based on changes in ebb shoal morphology. Figure 4-1 shows the proposed dredging location (*i.e.* northern alignment). See also USACE responses to the BBP (Barnegat Bay Partnership) Letter dated 22 March 2016.

USFWS Comment: The Affected Environment section of the draft EA should highlight the unique situation of the Little Egg Inlet in that it has never been dredged, is bounded by two naturally functioning wilderness areas, and that the inlet is part of a much larger ecosystem fed by water that flows through the largely undeveloped Pinelands National Reserve via the Bass River. It is one of a few remaining estuaries on the East Coast that been spared over-development and massive habitat destruction (Rice 2014). The Environmental Effects section of the draft EA should then address how the project will impact that ecosystem.

USACE Response: Noted. The information has been added to the EA.

USFWS Comment: Section 3.1.1 - The last paragraph of this section refers to the area's salt marshes. Not all salt marshes in the vicinity are managed by the Service. Additionally, salt marsh is not the only habitat that comprises the 6,600 acres of the Brigantine National Wilderness Area. That area also encompasses Forsythe NWR's beaches and vegetated upland habitat.

USACE Response: Noted. The information has been added to the EA.

USFWS Comment: Section 3.1.3 - Approximately 80% of Forsythe NWR is classified as salt marsh.

USACE Response: Noted. This has been corrected in Section 3.1. Section 3.1.3 presents wildlife.

USFWS Comment: Section 4.1.1 - While making general statements of no impact, the draft EA does not specifically address impacts to Little Beach Island. Only impacts to Holgate are addressed. Please explain specific impacts to dune and nearshore habitat on Little Beach Island if dredging were to occur in the inlet as proposed.

USACE Response: Noted. Additional discussion of Little Beach Island has been added to the Existing Environment section, the Impacts section, and Appendix B.

USFWS Comment: Section 4.1.2 - The EA seems to misquote the Service's PAR by stating the area's marshes are "one of the largest untouched marshes in New Jersey." The report references the Great Bay Boulevard Wildlife Management Area as probably being the largest untouched marsh in New Jersey. Please clarify.

USACE Response: Noted. Additional description has been added to clarify the land descriptions and ownership between the Federal U.S. Fish and Wildlife Service and the NJDEP.

USFWS Comment: In regard to Wilderness Areas (Holgate and Little Beach Units), in addition to providing a highly protected type of wildlife habitat, the Wilderness Areas exhibit qualities/values that would be impacted by the proposed project. The Corps has not addressed the specific impacts to wilderness characteristics that were requested in the Service's Planning Aid Report.

USACE Response: Additional language has been added to both the Existing Conditions Section and the Impacts Section to discuss potential impacts to wilderness areas.

USFWS Comment: Overall, the Corps should clearly define operation and methodology; duration of dredging operations; and location of all impact areas in and out of the proposed borrow areas (*e.g.*, staging, piping, dredge operation area). It is difficult to determine impacts without these details.

USACE Response: Additional language has been added to describe the proposed methodology and potential impacts to both shorelines as well as the borrow area to be more specific in the proposed location and dredge type utilized. Figure 4-1 has been added to illustrate the revised boundaries of the borrow area to reduce those sections closest to the shorelines and the proposed dredging area (*i.e.* northern alignment).

USFWS Comment: The USGS raised a number of concerns concerning the assumptions and conclusions derived from the ERDC model, including:

- The wave input is taken from stations offshore of the proposed borrow area and does not account for the changes that may result from dredging.
- A 10% increase in shoreline erosion is considered significant by USGS.
- The ERDC assumptions regarding downdrift erosion of Little Beach Wilderness Area are not realistic.

USACE Response: The USGS modeling report evaluation letter to the USFWS, and the Corps' responses to the USGS comments, are provided below.

USFWS Comment: The Service recommends that the Corps reconsider the Finding of No Significant Impact and provide a revised draft EA addressing all concerns raised by the Forsythe NWR and USGS. At this time, the Service cannot concur with the Corps' determination of not likely to adversely affect the piping plover, red knot, and seabeach amaranth. Additional consultation with the Service is necessary under Section 7 of the ESA. If the Corps cannot demonstrate or bring (through altered project design or

conservation measures) all adverse effects to the level of insignificant or discountable, formal consultation will be required.

USACE Response: Concur: additional consultation with the USFWS is necessary and is currently being conducted. The USACE has augmented the EA to provide additional information in support of our view that the proposed project is not likely to adversely affect the piping plover, red knot, and seabeach amaranth. A copy of the amended EA will be forwarded to you for review prior to release.

The borrow area boundaries have been revised to eliminate those portions inside the inlet close to the shoreline. A figure (Figure 4-1) has been added to the EA to delineate the proposed dredging location (northern alignment) and the revised boundaries. The proposed borrow area will be used for placement operations only in Section 6 (Beach Haven and the developed portion of Holgate). The proposed dredging location, at its closest point, is about 0.37 miles off of the Holgate spit shoreline and extends out and northward to 2.0 miles offshore. The spit will continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to grow (see Appendix B). Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate erosion processes occurring along Little Beach's southern shoreline due to the continual southwest natural transport. Major storm events have significantly altered the shorelines. The objective in dredging a small portion of the Little Egg Inlet borrow area is to provide a sand source for placement on the southernmost reaches of Long Beach Island while keeping buffer zones surrounding known potential cultural resources and a fiber optic cable in a self-replenishing ebb shoal area. Revising the borrow area boundaries to eliminate the portion within Little Egg Inlet serves to minimize any impact to the adjacent shorelines. In such a dynamic environment, the inlet any shorelines and position may change over time, as evidenced by the historical record. The potential impacts to the adjacent shoreline habitats due to dredging are considered insignificant and discountable.

USACE Responses to U.S. Geological Survey Letter dated 4 March 2016 to Virginia Rettig, U.S. Fish and Wildlife Service Edwin B. Forsythe National Wildlife Refuge

by Ashley Frey, PE; Alison Sleath Grzegorzewski; and Bradley Johnson, PhD

U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory (ERDC-CHL)

USGS Comment: "...found that while the methods appear internally consistent, the validity of many of the model assumptions were not tested. There also appeared to be limited testing of model sensitivity to these assumptions, which would likely change the outcome..."

ERDC-CHL Response: The model did not undergo extensive sensitivity and/or model assumptions testing for this study, mainly due to the time constraints associated with this particular study. To specifically address the comment on sensitivity testing, basic sensitivity testing was indeed conducted with a straight shoreline and idealized waves. The coefficients, K1 and K2, which are the main parameters that are adjusted during calibration, were tested. K1 impacts shoreline change and longshore transport along the entire domain while adjustments to K2 are seen near structures. The Little Egg Inlet study did not include structures; therefore, adjusting K2 made very little impact. Changes to K1 can significantly affect results, but that is the purpose of this particular parameter. The adjustment of other parameters, like depth of closure, berm height, and grain size, result in less significant impacts on the calculated shorelines and transport rates compared to adjusting K1. The reason these parameters might be adjusted during calibration is because it is possible that these parameters may vary along the domain. These parameters cannot be adjusted along the domain in GenCade, so some level of calibration might be necessary to determine the most representative depth of closure, berm height, and grain size along the entire domain. It is unlikely that the depth of closure or berm height would be adjusted more than a couple of feet or that the grain size would be changed by more than 0.05 mm during this process. Minor changes to these parameters do not make a significant impact on the calculated shoreline and transport rates.

USGS Comment: "Because wave model output are provided to GenCade seaward of the proposed dredging sites, the longshore transport rates in GenCade do not change in the model in response to alterations to the bathymetry as they would in the real system, and the impacts to waves and shoreline change are therefore considered independently in this report."

ERDC-CHL Response: The USGS interpretation of the GenCade model is correct. Because the adjustments to the borrow areas in STWAVE were landward of the save stations, any modification would not impact the waves at the save station. Therefore, it was decided to use the same waves for all of the dredging alternatives. Within the Inlet Reservoir Model (IRM) within GenCade, a user can specify a dredging removal volume for a shoal within the inlet. Therefore, the volumes of the dredging events were indeed included within the GenCade model. However, as USGS indicated, alterations to the bathymetry were not included.

USGS Comment: “It cannot be assumed that there will be an accelerated rate of sediment delivery to the inlet because the beach 2.5 miles (and farther) updrift of the inlet has been renourished (having to do with “source term” see below).”

ERDC-CHL Response: The GenCade grid domain did not extend to the location of the beach nourishment activities. The source term was added to the GenCade model to account for the impacts of these beach nourishments. While it is not known for certain if additional sediment will be delivered to the inlet due to renourishment activities, it is a very reasonable assumption. When a large volume of sand is placed on a beach, it will disperse over time. In this case, transport is predominately to the south. Over time, this sand will eventually move south towards the inlet.

USGS Comment: “The justification for adding this source term appears to be that the renourishment will accelerate the delivery of sand to the south. However, the GENESIS model part of GenCade should already predict the alongshore transport rate and delivery of sand to Little Egg Inlet, both before and after the beach nourishment. The processes by which this transport would be accelerated following the renourishment, and why GENESIS is unable to model this increase, are not explained. Without the addition of a source term, the GenCade results do predict downdrift beach erosion, which is consistent with the inlet equilibrium concept, as described above.”

ERDC-CHL Response: GenCade has all of the features and capabilities of GENESIS, the model cited by the USGS reviewers. The main differences between GenCade and GENESIS are that GenCade includes inlet features and has a more user-friendly interface than GENESIS. There are other minor differences as well, but they do not impact the way the model was applied during this study. Yes, GenCade does predict longshore transport of sand. However, the GenCade domain does not include the locations to the north of Little Egg Inlet that have been nourished. GenCade is a one-line model, and GenCade assumes that the beach (berm height and depth of closure) are the same within and outside of the model domain. Therefore, if there is a beach fill directly adjacent to the GenCade grid, the model would not “know” that a beach fill exists. A source term is the only way to include a beach fill that is not included in the domain. Adding a source term to represent a beach fill is a standard modeling practice.

USGS Comment: “Additional model sensitivity studies could also evaluate the likelihood of finding a significant impact (once significance is defined) given uncertainty in the GenCade calibration parameters.”

ERDC-CHL Response: Basic sensitivity testing of the model (idealized case) has been done. K1 and K2 are longshore transport calibration coefficients. These coefficients are meant to be adjusted during the calibration process based on how well the model reproduces measured shorelines and transport rates. The other parameters were based on measurements and/or other data. The only parameters adjusted (other than K1 and K2) during the calibration process for this study were the shoal volumes, based on data availability and reasonable engineering judgment. Due to the uncertainty in the initial shoal volumes due to lack of data, it was decided that these values would be adjusted during the calibration process. It should be noted that K1 and K2 were calibrated first. The shoal volumes were adjusted at the end of the calibration process to improve the calculated shoreline position in the proximity of the inlet. This adjustment did not impact shoreline change and sand transport along most of the GenCade domain.

USGS Comment: “The wave input is taken from stations offshore of the borrow area, so the modeling study did not account for the changes in the shoal due to dredging that were modeled with STWAVE. That is, there was no explicit wave transformation over shoal to feed in to the shoreline change modeling.”

ERDC-CHL Response: Based on our experiences, a borrow area landward of wave breaking has not been addressed with GenCade before. However, GenCade has been used in the past to model dredging scenarios. GenCade was used to model several dredging alternatives at St. Augustine Inlet in Florida (Beck and Legault 2012). An external wave model like STWAVE was not used for this study because all dredging alternatives occurred within the inlet (landward of breaking). Rather, the dredge volumes were incorporated through the Inlet Reservoir Model (IRM). For another study at Beaufort Inlet in North Carolina, the external wave model, CMS-Wave, was used to provide wave input for GenCade because an internal wave model did not predict a known reversal in transport. In addition, there have been several GENESIS (the predecessor to GenCade) studies which involved borrow areas seaward of breaking including at Ship Island, MS; Nags Head, VA; and Dare County, NC.

USGS Comment: “The regional shoreline contour seems to predispose the model to recreate the historic shoreline change.”

ERDC-CHL Response: The purpose of the GenCade regional contour is to maintain the desired overall shoreline curvature. The regional contour should incorporate large-scale trends in shoreline shape, and not small-scale features that are expected to change at time scales modeled by GenCade. For that reason, all shorelines were smoothed and small-scale features were removed. While averaging the 2002, 2007, and 2012 shorelines might cause the regional contour to be similar to the 2007 shoreline, it is only used to keep the large-scale trends along the shoreline. If the GenCade model was run for many, many years and no regional contour was used, the shoreline would evolve to a straight line. If a regional contour was used in the same situation, the shoreline would evolve to the regional contour. For this particular GenCade application, the reasoning for using the regional contour was to incorporate the inlet. Without the regional contour, the shoreline to the south of the inlet would straighten, and very significant amounts of accretion in this location would appear.

USGS Comment: Inlet flow dynamics – “The analysis does not consider changes to inlet cross-sectional area and friction, and how that will affect flows in/out of Great Bay. For instance, changes in tidal dynamics due to dredging could affect salinity in the Great Bay/Mullica River system. This effect can be quantified with one-dimensional classical estuarine models.”

ERDC-CHL Response: Correct, this study does not consider changes in inlet cross-sectional area and friction. Since the proposed dredging locations are outside of the inlet and will not affect the limiting cross-sectional area of the inlet, nor the entrance channels into each inland bay, which would be the controlling cross-sections of a classical estuarine model, the modeling would be expected to show no change in the hydrodynamics of the inland bays.

Additional Comments:

ERDC-CHL Response to USGS Paragraph #3 on Page #2: The STWAVE results of changes in wave energy density are provided as a qualitative indicator of the effect of proposed borrow options. The USGS reviewers correctly remarked that the 10% change was indicated in the figures. However, the 10% value was not meant to be interpreted as a demarcation between “significant” and “insignificant” effects. Permit us to reiterate that the effect of a borrow area is mostly a redistribution of wave energy and not a large-scale alteration of wave climate. Considering the long and successful history of conceptually modeling shorelines as a diffusion problem, it is expected that small changes in energy over short reaches will result in minimal effect of in shoreline position. The ERDC-CHL report comments regarding significance are provided as qualitative guidance with a basis in engineering judgment.

The USGS review continues, "It is possible that a small but persistent impact on the wave field over the shoal could lead to a significant impact to the inlet and shoreline over the longer time intervals considered by this study." It is worth noting that the provided STWAVE wave results were developed without any bottom changes over thirty years. In actuality, the borrow sites will smooth and infill in the active littoral zone. Therefore, any presented results are exaggerated with regard to the magnitude of effect on wave energy density. So in general, the changes are indeed small, but they are unlikely to be persistent.

ERDC-CHL Response to USGS Paragraph #3 on Page #3: The USGS review suggests that swell may be underestimated from shadows of the lateral boundary. However, STWAVE treats the lateral boundaries in a simplistic way: "While land boundaries will reduce wave growth near the boundaries as they “prevent” propagation from landward directions, water-defined boundaries allow a zero-gradient type of boundary condition. This zero- gradient boundary condition allows energy consistent with that of neighboring cells to propagate into or out of the domain along the lateral boundary" (Smith *et al.* 2001). So while regions in the shadow may not account for bathymetric variations outside of the domain, no systematic under-prediction is expected.

ERDC-CHL Response to USGS Paragraph #5 on Page #3: The effect of borrow regions on vegetated shorelines was beyond the scope of this effort. However, it bears repeating here that the presented wave power results were computed without bathymetric evolution. A more faithful representation would likely indicate *less* change. Additionally, the cited work from Leonardi *et al.* 2016 is based on variations in overall wave climate. Any effect of the small changes in wave energy over short reaches as demonstrated herein remains unclear.

References:

Beck, T.M., and K.R. Legault, 2012. Optimization of Ebb Shoal Mining and Beach Nourishment at St. Johns County, St. Augustine Inlet, Florida. Technical Report ERDC/CHL-TR-12-14: Report 3, US Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, Mississippi.

Smith, J. M., A. R. Sherlock, and D. T. Resio, 2001. STWAVE: Steady-state spectral wave model user’s manual for STWAVE, version 3.0. ERDC/CHL SR-01-1, Vicksburg, Mississippi. Army Engineer Research and Development Center.

USACE Responses to National Marine Fisheries Service Letter dated 30 March 2016

NMFS Comment: As the newly proposed action does not cause any effects not already considered in the 2014 Opinion, and no other triggers for re-initiation have been met, we concur with your determination that the proposed modifications do not trigger the need to reinitiate consultation pursuant to section 7 of the [Endangered Species Act] ESA, as amended.

USACE Response: No response required.

USACE Responses to the Borough of Ship Bottom Letter dated 7 April 2016

USACE Response: No response required.

USACE Responses to NMFS letter dated 13 April 2016

NMFS Comment: Anadromous fish species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass transit the inlet to reach spawning and nursery habitat....Catadromous American eel (*Anguilla rostrata*) spawn in the Sargasso Sea and transit the inlet as elvers to the freshwater habitats in tributaries to the bay.

USACE Response: Noted. This information has been added to the EA's Existing Conditions Section. Section 4.2.4.3 of the draft EA presents data and discussion of potential impacts to fish species from plumes generated by a hydraulic cutterhead suction dredge, potential impacts of dredging turbidity plumes on fish migration and Section 4.2.2 presents data available on sound impacts to marine species.

NMFS Comment: In order to minimize the adverse effects on anadromous and catadromous species, we recommend dredging within the inlet be avoided from March 1 through June 30.

USACE Response: Language has been added to the EA to more specifically describe the intended location of the proposed initial dredging and methodology. The proposed dredging location, at its closest point to the shoreline, is 0.37 miles and extends out to about 2 miles just slightly north of the mouth of the inlet in front of the south end of the Holgate spit. Due to concerns raised by the natural resource agencies, the proposed borrow area was reduced in size to 2050 acres to eliminate the portion that was located within the inlet. A figure (Figure 4-1) was added to the EA to illustrate the revised borrow area boundaries and the location of the proposed dredging (northern alignment). No dredging will occur within the inlet.

NMFS Comment: The DEA does not include any site specific sampling to determine if blue crabs overwinter within the borrow area. Recent benthic sampling done for this project was undertaken in July 2013. Blue crabs are not expected to be in the borrow area during the summer. Until additional surveys are done to determine the use of the borrow area by overwintering blue crabs, dredging should be avoided between December 1 and April 15th.

USACE Response: The current contract for dredging was scheduled to begin in April 2016 and be concluded by June 2016 for the proposed borrow area and therefore, would not occur during the period that blue crabs are likely to occur in the proposed borrow area. This schedule may be delayed 1-2 months. To dredge approximately 2 million cubic yards, a 4-month window is necessary, due to the potential for weather delays or equipment malfunctions and repair time. Mobilization can take 30 days. Based on NMFS's recommended environmental window periods to avoid dredging for potential impacts to American eel, striped bass, weakfish, sandbar shark, blue crabs, summer flounder, and winter flounder, only a two week period for dredging would occur in the latter part of the month of April and a two week period in the later part of the month of September. Your letter also advises that the Mid-Atlantic Fisheries Management Council's (MAFMC) policies should be incorporated in the final design of the project. Adding in MAFMC's recommendation eliminates the two weeks in April, leaving only a two week period in September to dredge. The Corps strives to avoid impacts to all natural resources in scheduling beachfill projects by following reasonable and prudent conservation measures to the maximum extent possible. The EA provides supporting documentation for our position that the proposed dredging project is not likely to adversely affect marine species of concern.

NMFS Comment: From the information provided in the DEA, it appears that portion of the borrow site provides habitat for surf clams (*Spisula solidissima*) although the document does not provide information of the specific densities of clams through the borrow site. We understand that only portions of the 3,288 acre site will be dredged to obtain sand, but the DEA does not include any details or maps of the areas to be dredged.

USACE Response: The EA was prepared to meet the requirements of the National Environmental Policy Act (NEPA) and other natural resources protective laws for the purpose of obtaining authorized use of the proposed borrow area for the LBI beachfill project. This includes the current proposed use for 2016 and possible future uses for the duration of the project life (until 2055). In such a dynamic environment, the inlet shoreline position and ebb shoals may change over time, as evidenced by the historical record (Appendix B), and the Corps needs flexibility within the revised delineated borrow area boundaries to select the best location for future possible dredging events based on changes in ebb shoal morphology. Any future scheduled dredging events would be coordinated with the natural resource agencies prior to award.

For the current contract, the draft EA describes the proposed dredging location being at its closest point to the shoreline 0.37 miles offshore (near the borrow area's boundary) and extending out to about 2 miles in a northern orientation, just slightly north of the mouth of the inlet in front of the south end of the Holgate spit. Due to concerns raised by the natural resource agencies, the proposed borrow area has been reduced in size to 2050 acres to eliminate the portion that was located within the inlet. A figure (Figure 4-1) was added to the EA to illustrate the revised borrow area boundaries and the location of the proposed dredging (northern alignment). No dredging will occur within the inlet or any closer to shore than as proposed for the current project.

For the benthic assessment undertaken in July 2014 for the LBI beachfill project (and described in Sections 3.2.4.2 and 4.2.3.2 of the draft EA), surf clams were collected within the borrow area boundaries in low numbers. Only 2 benthic sample sites (of 17 random benthic sampling locations) identified surfclams. Results of both these benthic samples and 20 surf clam trawls suggest that population densities are low and that a viable commercial fishery population does not exist within the borrow area.

NMFS Comment: The DEA does not adequately evaluate the potential effects that the removal of sand from the inlet's ebb shoal will have on the shorelines of the Refuge. In particular, we are concerned that the removal of sand from the ebb shoal will result in the loss of beach areas and wetlands downdrift of the inlet along Little Beach Island. The Corps should coordinate with USFWS and USGS on the information and assumptions used by the ERDC to develop the model of the shoreline changes that could result from this project to ensure that using the Little Egg Inlet as a sand borrow area does not affect the Refuge adversely or increase beach or wetland loss around the inlet.

USACE Response: Noted. Additional coordination with ERDC, USFWS, and USGS has taken place to provide responses to concerns raised during the draft EA review. Additional information has been added to the EA to address these concerns.

The Corps acknowledges the concern by resource agencies for how dredging may impact the shoreline habitat. Consequently, the Corps has revised the borrow area boundaries to remove the area located inside the inlet and will restrict all dredging to the areas seaward of the 0.37 mile distance offshore of the Holgate spit shoreline. A revised figure has been added to the EA to show the proposed dredging locations.

The Holgate spit is expected to continue to grow southwest while Little Beach Island's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. An historical aerial photography perspective of Little Beach Island has been added to Appendix B of the EA to illustrate how Little Beach Island morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate these erosion processes occurring along the shoreline due to the continual southwest natural transport and placement operations 3-5 miles north of the inlet (developed part of Holgate and Beach Haven). See ERDC responses to USGS model evaluation comments.

NMFS Comment: The Little Egg Inlet has been designated as EFH for a variety of life stages of federally managed species including..... EFH for highly migratory species designated in the area includes....

USACE Response: Noted. The EFH assessment provided in the Existing Conditions section (3.2.4.4) of the draft EA has been updated to include additional information provided in your current letter regarding Essential Fish Habitat (EFH) species, Species of Concern (SOC) and Habitat Area of Particular Concern (HAPC). The draft EA provides data in the Environmental Effects section (4.2.3.4) regarding potential impacts to these species and habitats, and measures the Corps will take to minimize or avoid adversely affected EFH species or habitat. These proactive measures are standard practice for all Philadelphia District beachfill projects, such as avoiding areas of high surf clam densities, adhering to feasible seasonal dredging window restrictions, avoiding large turbidity plumes by dredging larger grain size sediments that settle more quickly so as to avoid long-term impacts to water quality, minimizing disruption to fish migration or site-feeding by eliminating portions of the borrow area located within the inlet, minimizing potential entrainment impacts to fish early life stages (*i.e.* eggs and larvae) by prohibiting suction of the cutterhead until it is at or near the bottom, and reducing the impact footprint to benthic (food) organisms by dredging a narrow configuration within a small section of the borrow area.

As the draft EA presents, the Corps anticipates impacts to benthic organisms are temporary and populations are expected to recover quickly as the species have evolved to do in high energy dynamic coastal environments. The draft EA also presents discussion on the minimal impacts expected to water quality, and water sound impacts to marine species.

NMFS Comment: The EFH assessment does not evaluate fully the effect of the project on this HAPC or the sensitive life stages of sandbar shark. While we agree entrainment of sandbar shark early life stages is unlikely due to their size at birth, activities such as dredging (any method), barge overflow, and the placement of dredged material in the aquatic environment including placement as beach nourishment may affect sandbar sharks and their EFH and HAPC adversely.

USACE Response: Noted. The draft EA states that Great Bay provides important nursery and pupping grounds for the sandbar shark (Section 3.2.4.4). Additional language has been added to Section 3.2.4.4: Great Bay averages about 5 feet in depth, and provides extensive areas of estuarine substratum covered with algae and vascular plant beds in areas shallower than 3 feet. Extensive areas (3,355 acres) of intertidal sandflats and mudflats occur in this estuary, the result of the sediment load from the Mullica River and the movement of sand in through Little Egg Inlet.

Additional language has also been added to Section 4.2.3.4 to address potential impacts to sandbar sharks. The Corps recognizes that although larger sandbar sharks tend to occur in deeper waters and juveniles and adults can move away from the dredge equipment, the shallow areas within Great Bay are HAPC for this species and Little Egg Inlet provides access between the Atlantic Ocean and Great Bay/Mullica River estuary. The proposed dredging location is located sufficiently offshore (0.37 to 2.0 miles) and to the north of the inlet's throat that the likelihood of temporary elevated turbidity at the dredge is not likely to pose interference with fish migration in and out of the inlet. Turbidity plumes resulting from hydraulically dredging sand are localized and settle quickly-an hour or less (see EA Sections 4.2.1 and 4.2.4.2). The inlet throat at its minimal width is 4,200 feet wide between the southwest end of the Holgate spit and the northeast end of Little Beach Island, such that dredging offshore and to the north of the inlet will not impede fish migration. Given the current scour depths surpassing 42 feet in the inlet throat, it is likely that currents through the inlet are as high as 3 to 4 knots, making the inlet itself unlikely habitat for EFH species, and in particular neonate or juvenile sandbar sharks other than as a transit corridor between the Great Bay/Mullica River estuary and the Atlantic Ocean.

NMFS Comment: The June 2009 Amendment 1 to the Consolidated Highly Migratory Species (HMS) Fisheries Management Plan (NOAA 2009) states that mining for sand (e.g. for beach nourishment projects), gravel, and shell stock in estuarine and coastal waters can result in water column effects by changing circulation patterns, increasing turbidity, and decreasing oxygen concentrations.

USACE Response: the potential impacts of mining for sand for the proposed plan and potential impacts of changes to circulation patterns, increasing turbidity, and decreasing oxygen concentrations are addressed in the draft EA and the comment responses herein.

NMFS Comment: The 2009 amendment also include a number of EFH conservation recommendations for dredging and beach nourishment projects proposed within EFH for highly migratory species. These general EFH conservation recommendations include:

- Sand mining and beach nourishment should not be allowed in HMS EFH during seasons when HMS are using the area, particularly during spawning and pupping seasons.

USACE Response: the EA presents the Corps' evaluation of potential impacts of sand mining on EFH and HMS and conclusions drawn regarding the degree of the potential impacts. Placement operations were evaluated in two previous NEPA documents (USACE, 1999; 2014).

- Uncontaminated dredged material may be viewed as potentially reuseable resource if properly placed and beneficial uses of these materials should be investigated. Materials that are suitable for beach nourishment, marsh creation or other beneficial purposes should be utilized for these purposes as long as the design of the project minimizes impacts on HMS EFH.

USACE Response: Concur. The proposed plan has been developed with the objective to minimize impacts to EFH. Placement operations for the LBI beachfill project were evaluated in two previous NEPA documents (USACE, 1999; 2014).

- Sand and gravel extraction operations should be managed to avoid or minimize impacts to the bathymetric structure in estuarine and nearshore areas.

USACE Response: the Holgate spit is expected to continue to grow southwest while Little Beach Island's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. An historical aerial photography perspective of both the Holgate spit, Little Beach Island and changes to the inlet are presented in Appendix B of the EA to illustrate how the area morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate erosion processes occurring along the shoreline due to the continual southwest natural transport. Ebb shoals outside of the inlet will continue to develop.

- An integrated environmental assessment, management, and monitoring program should be part of any gravel or sand extraction operation, and encouraged at Federal and state levels.

USACE Response: Concur. The environmental assessment has been developed. Management will occur during operations to ensure that all environmental protective measures are followed, and the Corps monitors sand movement for all beachfill projects annually.

- Planning and design of mining activities should avoid significant resource areas important to HMS EFH.

USACE Response: the EA presents the Corps' evaluation of potential impacts of sand mining on EFH and HMS and conclusions drawn regarding the degree of the potential impacts. See above EFH comment responses.

- Given the increase in sea level rise and potentially growing need to re-nourish beaches, this activity needs to be closely monitored in areas that are adjacent to or located in HMS EFH.

USACE Response: noted.

NMFS Comment: In the case of Little Egg Inlet and Great Bay, pregnant sandbar shark females occur in the area between late spring and early summer, give birth and depart shortly after while neonates (young of the year) and juveniles (ages one and over) occupy the nursery grounds until migration to warmer waters in the fall (Rechisky and Wetherbee 2003 and Springer 1960). Neonates return to the natal grounds as juveniles and remain there for the summer. To minimize adverse effects to sandbar

sharks, dredging should be avoided from May 1 to September 15 when sandbar sharks use the area as an important pupping and nursery ground.

USACE Response: As noted in previous responses above, the dredging location is just outside of and to the north of the inlet mouth and at its closest point, 0.37 miles away from the inlet northern shoreline. The inlet throat at its minimal width is 4,200 feet wide and impacts to water quality are short-lived (see Sections 4.2.1; 4.2.3.2 and 4.2.3.4 of the EA). Additionally, the proposed borrow area is a highly dynamic ebb shoal region subject to waves and sand movement with continual shoaling and wave wash. As such, the proposed dredging location is not considered to have optimal habitat conditions for nursery or pupping grounds. The inlet serves as a migratory pathway for EFH species to reach optimal habitat within Great Bay and as noted in your letter, neonates and juveniles remain there for the summer. Dredging is not anticipated to pose adverse impacts to adult sharks nor impede migration through the inlet, offshore and north of the inlet.

NMFS Comment: Able *et al.* (1990) reported transforming summer flounder larvae have been collected in most of the major inlets along the New Jersey coast including Shark River, Manasquan River Inlet, Little Egg Inlet,The movement of transforming individual through inlets in New Jersey occurs primarily from October through December, but larvae have been collected as late as February in Little Sheepshead Creek inside Little Egg Inlet,... Festa (1974) also studied the distribution of young and larval summer flounder in New Jersey estuaries, and found that larvae enter New Jersey estuaries from at least early October to late January in most years and as late as March in certain years. Since these life stages are not capable of moving away from a dredge, even those species that are pelagic can be entrained in the dredge if the suction is on while the dredge head is moving through the water column. Entrainment of early life stages of summer flounder and other species can be reduced by ensuring that the suction on the dredge is not turned on until the dredge head is at or near the bottom and that it is turned off before the head is lifted up through the water column when dredging ceases.

USACE Response: Noted. As mentioned previously above, one of the proactive measures the Philadelphia District requires in its beachfill project contracts is prohibiting suction of the cutterhead until it is at or near the bottom.

NMFS Comment: Winter flounder also transit the inlet to reach spawning areas within the estuarine portions of the Great Bay and Little Egg Harbor bay when water temperatures begin to drop in the fall.movements into these spawning areas occurs earlier, generally from mid- to late November through December...to minimize impacts to winter flounder early life stages and their EFH, we recommend that activities be avoided from January 1 to May 31 of each year in areas that have been designated as EFH for winter flounder early life stages.

USACE Response: Noted. As mentioned previously above, the proposed dredging contract was scheduled to resume in April 2016 and completed by June. The project is likely to be delayed 1-2 months.

NMFS Comment: The use of the Little Egg Inlet as a borrow area for sand can also effect EFH adversely through impact of prey species.

USACE Response: Noted. Potential impacts to prey species are evaluated in the draft EA in Sections 4.2.3.2; 4.2.3.4; 4.9; 4.11; 4.13, and 4.14.

NMFS Comment: As a result, activities that adversely affect surf clams or impact spawning success and the quality for the nursery habitat of anadromous fish can adversely affect the EFH for winter flounder and juvenile blue fish by reducing the availability of prey items. Additionally, water quality degradation, increased turbidity, noise and vibrations from dredging operations may impede the migration of anadromous fish through the inlets to their upstream spawning grounds.

USACE Response: The potential for impacts to fish species, EFH, turbidity, noise, and vibrations are presented and evaluated in Section 4.0 Environmental Effects subsections and are addressed in the above-presented comment responses. As noted in the draft EA: *“In the ERDC literature review of dredging impact studies on finfish (Reine, 2014), the conclusions drawn include: 1) plumes generated by hydraulic cutterhead suction dredge are too small to cause migratory blockage of anadromous fish into the inlet; 2) concentration levels at the cutterhead when dredging sandy sediment are less than 10 mg/l, which pose no harm to any estuarine fish species; and 3) maximum TSS concentration estimated at the open-water discharge site are at or below 100 mg/l and only within the immediate vicinity of the dredging operation (30 m) and are insufficient to cause any harmful effect unless the most sensitive of the anadromous fish species purposely spent 24 or more hours within the dredge plume. Based on the current state of knowledge, hydraulic pipeline dredging of sand is unlikely to cause any negative effect to any fish species in the project area.”*

NMFS Comment: Over the 50-year life of the project, the EFH in the project area will be adversely affected numerous times as each dredging and beach nourishment event occurs. Currently, there is no mechanism for reporting of acres affected annually or notification to us when construction commences for each project segment or cycle....To ensure that we meet our joint responsibilities to protect, conserve, and enhance EFH and minimize adverse effects to living marine resources and their habitats, you should notify us prior to the commencement of each dredging event so that we may confirm that the EFH determinations and EFH conservation recommendations remain valid and a full re-initiation of the EFH consultation is not required. This notification should be done prior to the solicitation of bids for the contract so sufficient time is allowed for any recommended modification to be included in the bid documents.

USACE Response: There are currently 39 years remaining in the project life; likely resulting in about 5 dredging events for periodic nourishment. The Corps, as a matter of practice, sends email or letter notifications to the natural resource agencies prior to the known scheduled solicitation of bids date (usually 60 days). This allows for sufficient time for the Corps to coordinate with the Service agencies regarding the Magnuson Stevens Act and the Endangered Species Act prior to award.

NMFS Comment: The Mid-Atlantic Fisheries Management Council (MAFMC) has developed a policy statement on beach nourishment activities that may affect federally managed species under their purview...

1. Avoid sand mining in areas containing sensitive fish habitats (e.g. spawning and feeding sites, hard bottom, cobble/gravel substrate, and shellfish beds).

USACE Response: The proposed dredging location is sand and outside of and north of the inlet mouth. See previous comment responses above.

2. Avoid mining sand from sandy ridges, lumps, shoals, and rises that are named on maps. The naming of these is often the result of the area being an important fishing ground.

USACE Response: the proposed dredging area on the ebb shoals was selected for its self-replenishing character and proximity to the placement site. Infilling occurs rapidly due to the highly dynamic area and southerly longshore transport.

3. Existing sand borrow sites should be used to the extent possible. Mining sand from new areas introduces additional impacts.

USACE Response: see response #2 above. Existing authorized offshore borrow areas are also part of the proposed placement operations evaluated in the 1999 EIS and 2014 EA.

4. Conduct beach nourishment during the winter and early spring, when productivity for benthic infauna is at a minimum.

USACE Response: As mentioned previously above, the proposed dredging contract was scheduled to resume April 2016 and be completed by June 2016, however, it is likely that it will be delayed 1-2 months. This recommendation is counter to the NMFS recommendations provided in this letter for American eel, striped bass, weakfish, summer flounder, sandbar shark and winter flounder. If the dredging project were scheduled to avoid all stated NMFS and MAFMC environmental window recommendations, there would remain only a two week period in late September to dredge. The project will require approximately 4 months to complete.

5. Seasonal restrictions and spatial buffers on sand mining should be used to limit negative impacts during fish spawning, egg development, young-of-year development, and migration periods, and to avoid secondary impacts to sensitive habitat areas such as SAV.

USACE Response: these issues have all been addressed in the EA as well as in the above previous comment responses. No SAV beds occur within the proposed borrow area and no SAV beds within the shallow portions of Great Bay will be impacted by the proposed dredging offshore of the Holgate spit (see ERDC responses to USGS model evaluation comments pertaining to the potential for circulation impacts interior of the inlet).

6. Preserve, enhance, or create beach dune and native dune vegetation in order to provide natural beach habitat and reduce the need for nourishment.

USACE Response: Placement operations and dune grass planting has been evaluated in previous NEPA documents (USACE, 1999; 2014). The potential for impacts to dunes or vegetation along the shorelines closest to the proposed borrow area (Holgate and Little Beach Island) are evaluated in the current EA (2016). The Corps' position is that dunes and dune vegetation will not be adversely affected by the proposed dredging. This position is supported by the evaluation and data provided in the EA.

7. Each beach nourishment activity should be treated as a new activity (*i.e.* subject to review and comment), including those identified under a programmatic environmental assessment or environmental impact statement.

USACE Response: Noted. The Corps, as a matter of practice, sends email notifications to the natural resource agencies prior to the known scheduled solicitation of bids date (usually 60 days) for each dredging event. This allows for sufficient time for the Corps to coordinate with the Service agencies.

8. Bathymetric and biological monitoring should be conducted before and after beach nourishment to assess recovery in beach borrow and nourishment areas.

USACE Response: Noted. Numerous studies have been conducted over the past 25 years at both placement and borrow locations to assess biological recovery. The conclusions drawn from these studies indicate recovery to pre-dredging conditions within months to two years. Most indicate that dredging has only a temporary effect on infaunal communities and in some studies, differences in infaunal communities were attributed to seasonal variability or to hurricanes rather than to dredging. Some of these studies are presented in Section 4.2.3.2 of the draft EA. The Corps conducts annual surveys to assess the movement of sand from placement areas and monitors sand quantities in borrow areas prior to each dredging event.

9. The effect of noise from mining operations on the feeding, reproduction, and migratory behavior of marine mammals and finfish should be assessed.

USACE Response: The effect of noise from mining operations has been addressed. See Section 4.2.2 of the draft EA.

10. The cost effectiveness and efficacy of investments in traditional beach nourishment projects should be evaluated and consider alternative investments such as non-structural responses and relocation of vulnerable infrastructure given projections given sea level rise and extreme weather events.

USACE Response: Noted. Cost evaluations for the project are addressed in the 1999 EIS for the project. The 2014 EA and the current EA (2016) address sea level rise.

NMFS Essential Fish Habitat Conservation Recommendations:

1. To maintain access to the estuarine areas of EFH...dredging in borrow area should be avoided from December 1 to September 15. At other times of the year, at least 50% of the channel should remain open to allow the ingress and egress of aquatic species.

USACE Response: Noted. The proposed dredging plan will require approximately 4 months to complete. The December 1 to September 15 exclusion period leaves just 2.5 months. The proposed dredging will not occur inside of Little Egg Inlet. The proposed dredging location is located 0.37 to 2.0 miles offshore on the ebb shoals and slightly to the north of Little Egg Inlet such that 100% of the inlet will remain open to allow the ingress and egress of aquatic species.

The inlet throat at its minimal width is 4,200 feet wide between the southwest end of the Holgate spit and the northeast end of Little Beach Island, such that the proposed dredging location will not impede fish migration. Depths through the inlet on the southern (scour) side are more than 42 feet.

2. The intakes on the dredge plan should not be turned on until the dredge head is at or near the bottom and it should be turned off before lifted to minimize larvae entrained in the dredge.

USACE Response: As noted twice above, one of the proactive measures the Philadelphia District requires in its beachfill project contracts is prohibiting suction of the cutterhead until it is at or near the bottom.

3. Borrow areas should be surveyed for surf clams prior to use and areas of high surf clam densities within each borrow area should be avoided.

USACE Response: As was previously noted above, a benthic assessment was undertaken in July 2014 for the proposed project (and described in Sections 3.2.4.2 and 4.2.3.2 of the draft EA). Surf clams were collected within the borrow area boundaries in low numbers. Only 2 benthic sample sites (of 17 random benthic sampling locations) identified surfclams. Results of both these benthic samples and 20 surf clam trawls suggest that population densities are low and that a viable commercial fishery population does not exist within the borrow area.

4. Notification and re-initiation of the EFH consultation should be undertaken prior to commencement of each dredging event.

USACE Response: The Corps will consult with NMFS prior to the commencement of each dredging event.

NMFS Comment: Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH.

USACE Response: Noted. In addition to modifications made to the draft EA to address these concerns to EFH, the Corps will provide the above responses in a letter to the NMFS. The above responses demonstrate adherence to the EFH Conservation Recommendations to avoid impacts.

NMFS Comment: Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305 (b)(4)(B) of the MSA also indicates that you must explain its reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920 (k).

USACE Response: Noted. The draft EA presents the scientific justification for the Corps' position that the proposed plan to dredge sand from the Little Egg Inlet is not likely to adversely affect EFH or other marine species. Section 4.2.3.4 presents a discussion specific to EFH within the Little Egg Inlet and surrounding vicinity. Additionally, these comment responses have been provided to NMFS by letter.

NMFS Comment: Overall, the dredging of the ebb shoal is environmentally preferable to removing offshore sand ridges, but because a wide variety of resources transit the inlet at various times of the year, and the area's importance as a nursery and pupping ground for sandbar shark, seasonal dredging restrictions are necessary.... We recommend that a meeting be arranged between our offices and include fisheries staff from the New Jersey Department of Environmental Protection and USFWS to discuss needed surveys and monitoring, management strategies for the borrow area, and potential options to refine the seasonal dredging restrictions.

USACE Response: Noted. The Corps can participate in meetings with the above-listed agencies to discuss potential advisory strategies for utilizing the proposed Little Egg Inlet borrow area for the duration of the project life for placement on Long Beach Island.

USACE Responses to the Jacques Cousteau National Estuarine Research Reserve Letter dated 22 April 2016

JC NERR Comment: The proposed project may impact the Holgate and the Little Beach areas of the Forsythe National Wildlife Refuge, locations that are essential habitats for species that are protected under state and federal regulations. Specifically, this location supports the second highest piping plover nesting area in the state.

USACE Response: Noted. The draft EA presents the scientific justification for the Corps' position that the proposed plan to dredge sand from the Little Egg Inlet is not likely to adversely affect beach, dune, intertidal, and nearshore habitats of Holgate and Little Beach Island. This conclusion is based on a thorough evaluation of historical aerial photographs over the last 141 years; hydrodynamic modeling results of potential shoreline impacts of the proposed dredging area; previous beachfill operations at other nearby similarly dynamic inlet areas over the past 15 years (e.g. Absecon and Hereford) showing significant infilling (+100%) in 12-18 months; beach monitoring survey data showing significant volumes of sand moving downdrift of placement locations; and the Corps' institutional knowledge of the behavior of ebb shoal formation at new Jersey inlets.

Additionally, in coordination with natural resource agencies, the Corps has modified the borrow area boundaries to reduce the size by 80 acres in order to eliminate that portion of the borrow area closest to the (Holgate) shoreline. The Corps will follow all conservation measures as presented in the USFWS's Programmatic Biological Opinion to protect listed species, including the piping plover, red knot, and seabeach amaranth. For additional information concerning potential impacts to federal and state protected lands, please see the Corps' comment responses to the USFWS letter, dated 22 March 2016.

JC NERR Comment: Additionally, this area represents the only undredged channel between Montauk, NY and Assawoman, VA. The high quality habitat and minimal disturbance of the JC NERR area were key attributes that enabled establishment of the reserve. The proposed project may alter habitat and water quality that make this one of the least disturbed estuarine systems in the northeast, reduce its value as a long-term study site, and compromise the resources that rely on reserve habitat as well as alter the ecosystem services provided to area communities.

USACE Response: As noted above, based on a thorough review of available historical information, and hydrodynamic modeling studies, the Corps' has concluded that the proposed dredging will not adversely affect water quality or the high quality habitat within the inlet and its surrounding wilderness areas. The Holgate spit is expected to continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging. Little Beach's northernmost shoreline continues to elongate and enlarge. Along with the historical aerial photography perspective of the Holgate spit, a series of historical aerial photographs and summary description of Little Beach Island has been added to Appendix B of the EA to illustrate how beach morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue with or without dredging. Dredging approximately 2 million cubic yards at 0.37 to 2.0 miles offshore of the Holgate spit within the ebb shoals is not expected to exacerbate erosion processes occurring along the

shoreline due to the continual southwest natural transport. After placement operations on the southern end of the LBI project area, it is likely that sand transport towards the Little Egg Inlet may increase. The Corps maintains that dredging approximately 2.0 mcy of sand from the ebb shoal region will not impede the natural processes occurring in and around the inlet.

See also USACE responses to the BBP (Barnegat Bay Partnership) Letter dated 22 March 2016 and USACE responses to the USFWS letter dated 22 March 2016 and ERDC responses to USGS modeling report comments.

USACE beachfill projects are monitored after placement operations to evaluate sand replenishment needs and the movement from the project template through longshore transport processes. Based upon the District's extensive beachfill project history and monitoring experience, the most applicable inlet to draw similarity conclusions for Little Egg Inlet would be Hereford Inlet, located south of Seven Mile Island (Avalon and Stone Harbor). Stone Harbor has been the recipient of numerous beachfills since initially constructed in 2003. Predominate longshore transport is to the south along Stone Harbor and beachfill for Stone Harbor is dredged from Hereford Inlet's authorized borrow area. Beachfill placed on Stone Harbor migrates south via dispersion and ultimately returns to Hereford inlet. This return of sediment contributes to the borrow area infilling rate. Three recent examples of Hereford Inlet's borrow area infilling include surveys from October 2010, December 2012 and August 2014 where 101%, 107% and 105% respectively, of the dredge material returned to the borrow area within 18-24 months. Understanding the magnitude of the quantity of sediment being placed along Long Beach Island (regardless if the source is from the offshore borrow areas D1/D2 or Little Egg Inlet,) an accelerated rate of sediment transport is highly expected into the Little Egg Inlet area. This influx of sediment is predicted to infill any dredged borrow area in time frames very similar to what has been observed at Hereford Inlet, significantly limiting any temporary minor impacts to waves or shoreline change.

JC NERR Comment: Finally, the proposed site coincides exactly with a buried submarine cable that has been operated by Rutgers University.

USACE Response: Noted. The following has been added to the final EA in Section 4.9 Areas of Concern: "There is a fiber optic research cable buried within the Little Egg Inlet borrow area vicinity that will have a minimum of 500 foot buffer zones established on both sides where dredging is prohibited. The contractor will be required to contact the cable owner (*i.e.* Rutgers University Marine Field Station) to discuss the dredging work plan, obtain restrictions on the laying of submerged pipeline, anchoring and any other dredging operations around these cables." Detailed coordinates and description will also be added to the Specifications". A figure (Figure 4-1) has been added to the EA to delineate the cable's location and buffers.

USACE Responses to the Rutgers University Marine Field Station letter dated 22 April 2016

Rutgers Comment: My comment is simple, but I think compelling. Little Egg Inlet is the only inlet within New Jersey that is unaltered by dredging and other human activities. In addition, this inlet is surrounded by a federally managed, natural wildlife area as part of the Forsythe National Wildlife Management Area. As such, it offers an exceptional opportunity to determine how an unaltered inlet responds to

natural events such as hurricanes, nor'easters, sea level rise, etc. Once it is altered, we (the research community and the public) lose this sentinel site for all time.

USACE Response: Noted. The Corps recognizes the importance of the undeveloped nature of the inlet and its surrounding natural wildlife areas. The Corps also recognizes the value to the research community and to the public of the unaltered condition of the inlet and surrounding vicinity in a highly populated state of the Mid-Atlantic Region. The Corps has provided in the EA a thorough evaluation of anticipated effects of dredging to the area and information to support our position that dredging approximately 2 million cubic yards of sand from the ebb shoal located just outside of and slightly north of the mouth of Little Egg Inlet will not impede the natural processes occurring within the inlet system. The amount of material proposed to be dredged from the ebb shoal is a small fraction of the amount of material researchers estimate is carried towards the inlet through southwesterly longshore transport.

The Holgate spit is expected to continue to grow southwest while Little Beach's southernmost shoreline has receded in the absence of any dredging, as portrayed in Appendix B. Little Beach's northernmost shoreline continues to elongate and enlarge. Infilling at the ebb shoal dredging location is expected to occur within 12-18 months, similar to what has been observed at other New Jersey inlets (*e.g.* Hereford and Absecon). A series of historical aerial photographs and summary description of Little Beach Island has been added to Appendix B of the EA to illustrate how beach morphology has changed over the last 141 years in the absence of dredging. These trends are expected to continue.