DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

May 21, 2014

Mr. David Stilwell
Field Supervisor
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

Subject: Fire Island Inlet to Moriches Inlet Stabilization Project (FIMI)

Dear Mr. Stilwell,

The US Army Corps of Engineers and the Department of the Interior have held a series of meetings and conference calls over the past several months on the above referenced project to discuss project elements as they relate to ongoing formal consultation pursuant to Section 7 of the federal Endangered Species Act of 1973, as amended (l6 U.S.C. 1531 et seq.; Act). The Corp and Interior had requested this collaboration to finalize the outstanding project description issues that may affect the piping plover (*Charadrius melodus*; threatened) and the seabeach amaranth (*Amaranthus pumilis;* threatened). This letter formulates the agreed upon actions to offset any impacts to the endangered species within the project area.

Participants at these meetings and conference calls included representatives from the U.S. Army Corps of Engineers, Department of Interior, U.S. Fish and Wildlife Service (USFWS), National Park Service - Fire Island National Seashore, New York State Department of Environmental Conservation (NYSDEC) and Suffolk County. The discussion focused on the following topics (with their respective summaries):

1. Monitoring Program. The monitoring program will take place from Inlet to inlet to supplement (not replace) existing programs with the intent to add consistency to the monitoring and reporting. The program splits the plover reproductive activities into two phases: nest and incubation activities, from which breeding population size is estimated, and hatching and fledging activities from which reproductive success is estimated. A set of habitat maps will be provided annually to illustrate the location of nests and the outcome of each breeding attempt. The monitoring program will also note the ongoing influences by the project features. When nests are located, they are either inconspicuously marked or surveyed with GPS to facilitate relocation for monitoring and predator exclosure installation. The monitoring program will also complete a single annual census, standardized on the East Coast to occur during the first 10 days in June. The census numbers gathered during the designated window permits a count for the

entire population on site, including non-breeding individuals. Results are compared to the nesting population to address any anomalies.

2. Predator management. All agencies agreed to mammalian predator management (10yrs) inlet to inlet which will be a federally-funded program, and that implementation will be coordinated between all agencies and the affected land owners/managers. On Federal properties, there is a commitment of exclosures and stewardship, within available authorities, recognizing there are limitation on trapping and killing predators in the absence of more detailed studies and assessments. The primary management effort to reduce wildlife impacts to nesting plovers is the use of nest site predator exclosures, an effective non-lethal method of protection. It necessitates that staffing is adequate to find plover nests in a timely manner. It also requires personnel time to construct exclosures at the nest sites. There are not effective management options to address wildlife impacts on plovers during the courtship or brood rearing phases of the breeding cycle under the current program. The secondary management tool to be used to reduce wildlife impacts is predator control. It was acknowledged that compliance and permitting for predator control needs to be established.

3. Stewardship/Visitor Management. Attempts will be made to eliminate or reduce human disturbance to plovers during all phases of breeding. Plover habitat utilization and human use patterns are well established, facilitating installation of appropriate area closures. A 200 meter disturbance buffer is used to protect most breeding habitats. In areas where plover breeding activity occurs in close proximity to human use areas, an assessment will be made of the sensitivity of the birds on site. When possible, an attempt is made to maintain some level of recreational opportunities. When in doubt, visitor use is curtailed to ensure that breeding activities are protected. Park staff, researchers, operation and maintenance and emergency vehicles with a legitimate need to work in or travel through plover breeding areas will receive training to reduce the potential risk to the plovers. Staff and cooperators with irregular needs to access sensitive areas are provided escorts. Law enforcement officers are offered training to accommodate the need to patrol the beach and inlet areas.

4. Off Road Vehicle (ORV) Use. All agencies recognized that there are federal ORV guidelines in place that are currently followed within Fire Island National Seashore and Smith Point County Park. Both agencies agreed that the ORV guidelines will continue to be followed in the future. It was acknowledged that nesting distance from the beach, breeding bird behaviors and reaction to humans or vehicles vary from year to year. Dependent on foraging habitat condition at the time of brood rearing, chicks may or may not use the bay or ocean intertidal zone for foraging. Unpredictable behavior and habitat use has resulted in a stepped progression of visitor management actions in the past. Normally, observations are made of birds in courtship to identify management areas. As soon as nests are initiated, an assessment is made to determine the sensitivity of both breeding adults to human use. When birds react negatively to human disturbance, the normal travel corridor is reduced in width in an attempt to accommodate passage of vehicles and pedestrians. If traffic or pedestrian use cannot be accommodated, a full area closure is placed in effect. A similar assessment and closure progression is made for

brood habitat needs if the nest successfully hatches. On the non-beach sides surrounding ORV area nests the standard 200 meter buffer distance is used to protect plover breeding activity.

5. De-vegetation Maintenance/Dune and Burma Road Re-alignment/Habitat Restoration and Creation. After much discussion, the participants agreed on the following plan modifications which are shown in table 1. The final plan layout is also attached.

6. Monitoring Effectiveness. It was discussed that the conservation/protection measures and habitat restoration for threatened and endangered species are often guided by anecdotal evidence and there is a need to better utilize time and resources on effective strategies. The project will monitor and evaluate the effectiveness of the above mentioned measures and then provide revised recommendations if need be relating to the restoration of breeding habitat and the optimization of reproductive success. An interagency team will be assembled to define a strategy and identify the key questions to be addressed. It was noted that resources will be leveraged from other initiatives to compliment the project funds.

The District appreciates your continued commitment to this project and anticipates a draft Biological opinion on May 23, 2014. If you should have any questions, please contact Mr. Robert J. Smith of my staff at 917-790-8729.

Sincerely,

Frank Santomauro, P.E.
Chief, Planning Division

Attachment
cc. USFWS-LIFO
Chris Soller, Superintendant, NPS-FIIS
Alan Fuchs, Director, Bureau of Flood Control and Dam Safety, NYSDEC
Glibert Andersen, P.E., Commissioner, Suffolk County DPW
Paul Phifer, Assistant Regional Director, USFWS, Northeast Region

TABLE 1.

Plan Modifications	
Pattersquash Island Overwash – 13 HA	
Dune location	Seaward location, as shown on plans.
Dune Slopes	1:5 slopes.
Dune Planting	Vegetated 18" spacing.
Dune De-vegetation	No dune management.
Bayside De-vegetation	De-vegetate when >30% cover, 10 yrs.
Project Sand-Fencing	No project installed sand fencing.
Locally-installed fencing	No limitation on locally-installed sand fencing within dune and within 75 ft buffer (allow for vehicle management).
Road location	Burma Road located within 75 ft buffer north of landward toe of dune to maximize bayside habitat.
Smith Point Breach Overwash – 6.1 HA	
Dune Location	Seaward location, as shown on plans.
Dune Slopes	1:5 slopes.
Dune Planting	Vegetated 18" spacing.
Dune De-vegetation	No dune management.
Bayside De-vegetation	De-vegetate when >30% cover, 10 yrs.
Project Sand-Fencing	No project installed sand fencing.
Locally-installed fencing	No limitation on locally-installed sand fencing within dune and within 75 ft buffer (allow for vehicle management).
Road location	Burma Road located within 75 ft buffer north of landward toe of dune to maximize bayside habitat.
New Made Island Overwash – 10.5 HA	
Dune location	Seaward location, as shown on plans.
Dune Slopes	1:5 slopes.
Dune Planting	Vegetated 18" spacing.
Dune De-vegetation	No dune management.
Bayside De-vegetation	De-vegetate when >30% cover, 10 yrs.
Project Sand-Fencing	No project installed sand fencing.

Locally-installed fencing	No limitation on locally-installed sand fencing within dune and within 75 ft buffer (allow for vehicle management).
Road Location	Burma Road located within 75 ft buffer north of landward toe of dune to maximize bayside habitat.
Great Gun Area & expanded Great Gun East - 34 HA	
Recontouring	Maintain existing dune adjacent to the road. The berm would be configured as +9 that steps down to elevation +7 to promote ephemeral pools. Specific plans to be developed. Need to assess volume of sand, and will keep sand in the system.
Construction – De-vegetating berm	De-vegetate fronting berm, as part of recontouring.
Adaptive De-vegetation	De-vegetate when >30% cover, 10 yrs.
Adaptive pool management	Maintain berm height if too high. Focus on pre-season efforts to maintain height. Subject to adaptive management.
New Made Dredge disposal habitat location - 4HA + 2 HA expansion	
Recontouring	Lower dike to adjacent grades, regrade existing substrate, and cover with 2 ft of ocean sand. Achieve desired slopes and percentage of foraging / nesting habitat. Specific plans to be developed, possible connection to the east for an additional 2 HA.

Emailed 03/04/2014

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

March 4, 2014

Colonel Paul E. Owen, P.E.
U.S. Army Corps of Engineers
Commander, New York District
26 Federal Plaza
New York, NY 10278

Attn: Mr. Peter Weppler

Dear Colonel Owen:

Re: Response to request for initiation of formal consultation for the Fire Island to Moriches Inlet Federal Stabilization Project

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your Biological Assessment (BA) for the above-referenced project, received in our office via electronic mail at 5:09 p.m. on Friday, February 28, 2014, as well as your request to initiate formal consultation for the above-referenced project pursuant to section 7 of the federal Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*; Act). The U.S. Army Corps of Engineers (Corps) has requested consultation for project impacts that may affect the piping plover (*Charadrius melodus*; threatened) and the seabeach amaranth (*Amaranthus pumilis*; threatened).

Section 7 allows the Service 30 days to review a BA and determine its adequacy. However, upon receipt of your BA, we conducted an expedited review and identified some issues needing clarification. These issues were clarified on March 4, 2014, during telephone discussions between our respective staffs and formally sent to us by you via electronic mail. We consider these additions to be incorporated into your BA and are now understood to be part of your project description.

All information required to initiate formal consultation was either included with the BA and associated documents or sent to us on March 4, 2014. Consequently, formal consultation is considered to be initiated effective this date. Please note that although we have received adequate information to initiate consultation, it may be necessary to further clarify any issues that may arise during this process. We expect to remain in close coordination with the Corps throughout the consultation.

As a reminder, section 7(d) of the Act requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats until formal consultation has been concluded.

If you have any questions, please contact me at 607-539-9334.

Sincerely,

David A. Stilwell
Field Supervisor

United States Department of the Interior

NATIONAL PARK SERVICE
FIRE ISLAND NATIONAL SEASHORE
120 Laurel Street
Patchogue, New York 11772
(631) 687-4750

IN REPLY REFER TO:

H-2415(FIIS)

January 16, 2014

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, New York 10278

Dear ~~Colonel Owen~~ Paul:

On December 19, 2013, I received email correspondence from Frank Santomauro, Chief of Planning for the New York District, U.S. Army Corps of Engineers (Corps) as a follow-up to a technical meeting held with Corps staff and representatives from the National Park Service (NPS), U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation, and Suffolk County, New York. The goal of the meeting was to investigate potential modifications to the proposed Fire Island to Moriches Inlet Stabilization plan (FIMI) that would provide increased protection and improved productivity for federally listed species under the Endangered Species Act. This letter provides the NPS response to Mr. Santomauro's letter.

The NPS was asked to comment on four proposals. Two proposals would occur on NPS lands and two would occur on Suffolk County land at Smith Point County Park, all four are within the boundary of Fire Island National Seashore. The two proposals that would occur on NPS lands recommended the realignment of proposed dunes further northward than previously proposed as part of Fire Island to Montauk Point Reformulation Plan (FIMP) to "preserve" piping plover habitat created by Hurricane Sandy as a result of over wash in the areas of Robbins Rest and the Fire Island Lighthouse. It was also recommended that the "preserved habitat would be monitored for the five year life of the project and, as determined by the monitoring results, appropriate actions (such as de-vegetation(sic)) taken to maintain early succession stages of plover habitat." For the Lighthouse tract grading was also identified as an action that could be undertaken as a part of the maintenance program.

The proposals for Smith Point County Park addressed dune realignment also to preserve habitat created by Hurricane Sandy where there was extensive over wash. In another area at Smith Point County Park the recommendation was to de-vegetate an area to reestablish piping plover habitat.

The NPS generally supports the proposals to realign the proposed dunes northward, where appropriate, to "preserve" habitat. However, as I discussed at the meeting on December 18, the maintenance of the habitat by means of de-vegetation and grading is not appropriate on NPS lands. *NPS Management Policies* direct the NPS to allow natural processes to take precedence and natural re-vegetation and sand accretion on beaches, berms and dunes are critical to a stable and sustainable barrier island. NPS will

monitor the Lighthouse tract and the Robbins Rest for piping plover and other threatened and endangered species and will, as we have always done, establish limitations and restrictions so as to protect listed species that nest or germinate in these areas, however, we cannot support the active manipulation of habitat in these areas.

Additionally, as I discussed on December 18, the Fire Island Lighthouse is a major feature of a National Register District, listed on the National Register of Historic Places. The Fire Island Light Station Historic District's boundaries run from the water line along the Atlantic Ocean to the water line of the Great South Bay and from the eastern boundary of Robert Moses State Park to a north/south line about 200 feet east of the NPS Ranger Station/Checkpoint located east of the lighthouse. Upon review of the Lighthouse Historic District's boundaries and consultation with NPS cultural resource compliance staff, it is clear that a formal, National Historic Preservation Act Section 106 consultation will be required regarding any actions being proposed for the Lighthouse tract within the National Register District. The first step in this process will require a cultural resource assessment to be undertaken by the Corps. Once that cultural assessment is completed, NPS will then begin the formal consultation process. Until such time as the NPS completes such a consultation we cannot concur with any action proposed for this area.

As part of FIMP planning, the NPS agreed to permit beach nourishment on NPS lands adjacent to Robbins Rest so as to ensure that the dune/berm system in this area was not weakened or compromised by a lack of nourishment in the reach between the communities of Atlantique and Fire Island Summer Club. Prior to Hurricane Sandy the NPS did not support beach nourishment in the Lighthouse tract. As a result of the extensive over wash at the Lighthouse tract and the loss of dunes in that area, the NPS agreed to nourishment in the Lighthouse tract to reestablish the berm and dune line in the general location it had been prior to Hurricane Sandy. The NPS support of nourishment in this area is to provide protection to the historic resources of the Fire Island Light Station Historic District and the primary, inland, vehicular emergency access route on and off Fire Island for the Fire Island communities.

Again, I want to reiterate that the NPS generally supports realignment of the dunes where appropriate but does not support maintenance activities on NPS lands that would de-vegetate naturally occurring vegetation and grade sand accretion that naturally occurs and are consistent with the natural processes of barrier islands. The NPS remains committed to working with the Corps to facilitate completion of this project. Thank you for the opportunity to provide these comments. If you have any questions, please contact me at 631-687-4752.

Sincerely,

K. Christopher Soller
Superintendent

cc: Frank Santomauro (USACE)
Peter Weppler (USACE)
Michael Caldwell (NPS)
Mary Foley (NPS)
Herbert Frost (NPS)
Rachel Jacobson (DOI)
Andrew Raddant (DOI)
Wendi Weber (USFWS)
David Stilwell (USFWS)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

January 9, 2014

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, New York 10278

Dear Colonel Owen:

This is the U.S. Fish and Wildlife Service's (Service) response to the U.S. Army Corps of Engineers (Corps) electronic mail attachment dated December 19, 2013, which provides the Corps' most recent project modifications for the proposed Fire Island to Moriches Inlet - Fire Island Stabilization Project (FIMI). The Corps' revised plans are based on feedback the Corps received during an interagency meeting held on December 18, 2013, between the Corps, National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), County of Suffolk (County), and the Service.

The overall purpose of the December 18, 2013, meeting was to continue discussing the project design features that the Corps should implement to meet requirements of section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), and to consider habitat restoration proposals that would further the restoration of degraded habitats and natural coastal processes in the project area. Prior to this meeting, the Service provided a number of recommendations in a letter to the Corps dated December 13, 2013 (enclosed), to avoid and minimize adverse effects to federally listed and proposed species, including the piping plover (*Charadrius melodus*; threatened), seabeach amaranth (*Amaranthus pumilus*; threatened), roseate tern (*Sterna dougallii dougallii*; endangered), and red knot (*Calidris canutus rufa*; proposed threatened). As noted in that letter, we developed our recommendations based on best available science, including the result of a long-term study funded by the Corps, on the effect of beach nourishment and dune construction on plovers, as well as other peer-reviewed and grey literature, and agency expertise.

The Service recognizes that this project presents a number of challenges to the Corps due to its complexity, scope (18 miles), timing, multiple jurisdictional coverage, land use and land ownership patterns, and the sensitive natural resources that are present, including off-shore, back-bay, and barrier island fish and wildlife resources, and species protected under the ESA and Migratory Bird Treaty Act (MBTA) of 1918, as amended. Consequently, we appreciate all your efforts to lead this planning effort, including fostering an open and collective dialogue among the

interagency team as we move forward. We also appreciate the Corps' affirmation of its obligations to avoid and minimize adverse impacts to threatened and endangered species under section 7(a)(2) of the ESA and to consider the Service's recommendations to avoid and mitigate impacts to other fish and wildlife resources pursuant to the Fish and Wildlife Coordination Act of 1958 (48 Stat. 401, as amended; 661 *et seq.*) and the MBTA.

In your December 19, 2013, letter, you inquire whether we concur that the modifications arrived at the meeting "...will, collectively provide for more suitable habitat over time than the currently proposed plan you were sent earlier this week." Further, you inquire whether our agency "...is in agreement with our assessment that the modifications described above would prove beneficial and serve to improve the status of the listed species within the stabilization project area." To these two points, we concur that the recommendations adopted by the Corps are an improvement over the earlier proposed plan and impact less habitat than the earlier proposal. As expressed earlier in this letter, we appreciate the Corps' efforts to make such modifications.

In addition to the improvements you have suggested, we reiterate that there are other possible alternatives available that could further diminish the impacts to habitat and provide storm protection. Our primary recommended alternative was to have no solid dune at Smith Point County Park, but to construct an enhanced berm. At the meeting, other alternatives were also provided and considered. The Corps presented a "staggered dune" approach at Smith Point County Park that would consist of two lines of dunes with overlapping staggered openings. This approach could: (1) Provide some overwash and ocean-to-bay habitat, which may prove beneficial to the piping plover; (2) provide sediment transport at low storm levels, and (3) prevent excess water movement at high storm levels. Although this approach would be experimental, it could provide the opportunity to study this for potential future use in other areas. The Service also suggests another alternative to having the dune extend the entire length of the park bisecting all of the newly created habitat. The Service suggests that at least one of the three overwash lobes should not have a dune constructed through it to preserve one of these premier habitat units. These ocean-to-bay overwash units have the highest potential to increase piping plover productivity among all habitat types on the barrier island system In addition to preserving a portion of this premier habitat, we will also have another opportunity to study plover response to the habitat creation. Although we appreciate monitoring and adaptive management of vegetation in specific Smith Point Park areas, preserving these ocean-to-bay overwash lobes is most likely to provide the most recovery benefits. Another alternative would be to have breaks in the dunes, such as being done at the Corps' project on Assateague Island. This would not be incompatible with the current system as numerous breaks are currently being maintained in the dunes for off road vehicle access to the beaches.

As the agencies reached satisfactory compromise in all the other project segments, we request you give reconsideration to the other alternatives for Smith Point County Park. The Service remains committed to working with the Corps to facilitate completion of this project. We are available for further discussion.

The Corps, as the action agency, will decide the final project design and provide a Biological Assessment to the Service. The Service will then complete our Biological Opinion based on the selected project design and Biological Assessment as expeditiously as possible.

Thank you for the opportunity to provide these comments. If you have any questions, please contact me at 607-753-9334.

Sincerely,

for David A. Stilwell
Field Supervisor

Enclosure

cc:

NYCOE, NY, NY (J. Seebode; P. Weppler; N. Brighton)
NPS, FINS, Patchogue, NY (C. Soller)
NPS, Boston, MA (M. Foley)
USGS, Woods Hole, MA (W. Schwab)
USGS, St. Petersburg, FL (C. Hapke)
DOI, OEPC, Boston, MA (A. Raddant)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

December 13, 2013

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, NY 10278

Dear Colonel Owen:

This is in regard to the U.S. Army Corps of Engineers' (Corps) Fire Island Stabilization Project and the recent coordination between our offices pursuant to the Endangered Species Act of 1973, as amended (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) and Fish and Wildlife Coordination Act of 1958, as amended (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) (FWCA). The U.S. Fish and Wildlife Service (Service) has reviewed the preliminary project plans provided to our office via electronic correspondence dated December 9, 2013. The purpose of this letter is to provide early recommendations for discussion at the meeting scheduled for December 18, 2013, between our staff to advance the habitat restoration and to identify endangered species conservation measures.

We appreciate the opportunity to work closely with your office on this and other projects coordinated by the Corps' Planning Division, Regulatory Branch, and Operations Division, such as the Fire Island to Montauk Point Storm Damage Protection Reformulation Study (FIMP), Fire Island Inlet and Shores Westerly Navigation Project, and the various other projects around Long Island which were undertaken in response to Hurricane Sandy. As we have expressed in several meetings with you and your staff, the newly designated Fire Island Stabilization Project, as presented, includes features which would be counter to the long term survival and recovery of the piping plover (*Charadrius melodus*; threatened), present additional challenges for the recovery of the seabeach amaranth (*Amaranthus pumilus*; threatened), and likely limit the amount of suitable bay shoreline and ocean habitats to the red knot (*Calidris canutus rufa*), a proposed species for listing under the ESA. In addition, this project will have impacts to other migrating shorebirds such as the state-listed least tern (*Sterna antillarum*) and common tern (*Sterna hirundo*), as well as the American oystercatcher (*Haematopus palliatus*).

In terms of the plover, we have stated in a number of biological opinions on Corps' projects since the 1990s, that large-scale, long-term shoreline stabilizations will affect the ability of the species to recover and survive in the wild. Throughout the informal consultation process for the FIMP and the several times we met over the Fire Island Stabilization Project, we have recommended measures and restoration proposals that the Corps should incorporate into the project description to avoid jeopardy of the piping plover. Our recommendations were developed using the best available science and information on this species and were put forth in the spirit of assisting the Corps in avoiding jeopardy and advancing the Corps' Vision Statement "Restoration Framework," by focusing on the restoration of natural barrier island and back-bay processes, including but not limited to, cross-island and long shore sediment transport processes.

Based on our discussions on December 6, 2013, and the current project proposal we are offering recommendations for your consideration.

At this juncture, we have tailored our recommendations to help advance the Corps' objectives in the project in a manner which provides a level of storm damage protection to some of the most critically affected shoreline areas but which also avoids jeopardy to this listed species. As currently configured, the Corps plans a shoreline construction plan in some of the most optimal piping plover habitat created by Hurricane Sandy, especially in Smith Point County Park. Our preliminary recommendations on the entire plan, which stretches from Robert Moses State Park to Smith Point County Park, include consultation requirements, modifications to the dune alignment and berm construction layouts, and means to avoid and minimize indirect effects of the project are presented below.

Service Comments

1) As we have discussed, the Fire Island Stabilization Project will require formal consultation, and, therefore, and the preparation of a biological assessment by the Corps. 50 CFR Part 402 stipulates that once formal consultation is initiated, the consultation period is 135 days; however, we will do our best to expedite this action. Formal consultation would be required as the project prevents to a large degree the formation of natural geomorphic features on the barrier island by significantly reducing or preventing overwashes and breaches, which create habitats necessary for the recovery and survival of the piping plover and seabeach amaranth in the wild. The project will also have impacts to the red knot in New York by limiting the development of naturally created sand flats and bay shorelines. Formal consultation will also be required to address other indirect effects of the project including human disturbance, predation, etc.

2) We recommend that between Fields 2 and 3 in Robert Moses State Park that the dune alignment be shifted north to just north or south of the unimproved utility road. In this way, existing overwash and dune blow out habitats will not be significantly impacted by the proposed dune system. Berm placement can occur in the specified location at 9 ft National Geodetic Vertical Datum (NGVD) maximum elevation.

3) We recommend that in the federal Lighthouse Tract the dune alignment be shifted north to lie adjacent to the Fire Island National Seashore's western access road. This alignment will provide protection to the road and existing infrastructure but allow the naturally created overwash habitats to undergo natural succession unimpeded by the Corps' proposed location of the dune system. Berm placement can occur in the specified location at 9 ft NGVD maximum elevation.

4) We recommend that in the area between Atlantique and Robins Rest that the dune alignment be shifted north as much as feasible. Berm placement can occur in the specified location at 9 ft NGVD maximum elevation.

5) We recommend that the Corps' eliminate the proposed artificial dune system in Smith Point County Park stretching from just west of Pattersquash Island to the eastern extent of the proposed dune placement area. Berm placement can occur in this area in the specified locations at 9 ft NGVD maximum elevation and sand by passing should continue in this area to restore long shore sediment transport. As currently proposed, the construction of an artificial dune in this area would effectively eliminate the possibility of any bay to ocean overwash habitats (cross island transport) in areas where barrier island infrastructure is not a concern.

6) The Fire Island Stabilization Project will require measures to protect federally listed species and other state and federally protected -shorebird species such as common and least terns, American oystercatchers, and migrating shorebirds which might utilize the project area. Protection measures will need to be developed through the consultation processes of the ESA

and FWCA to address impacts related to recreational use of the beach, predators, and vegetation encroachment into listed species habitat. We had worked with the Corps on the development of a template for threatened and endangered species management for the larger FIMP and recommend that the Corps revitalize that effort, with the goal of developing a comprehensive management plan covering recreation, predator control, and vegetation across the Fire Island Stabilization Project Area.

We have also been in discussion and negotiation with the Planning Division on a multi-year Transfer of Funding Agreement that would enable us to work nearly exclusively on Corps' Hurricane Sandy Projects. We believe it is in the best interests of both our agencies to have your office finalize the latest version of the scope of work as soon as possible so we can begin to move forward and prepare the necessary reports your agency requires.

7) We support restoration projects in the back-bay areas except for areas near the naturally created overwash habitats in Smith Point. These areas should be allowed to function naturally. As you are aware, many of the proposed locations for restoration were in areas we recommended in 2008 as part of informal section 7 consultation. We would still like to discuss with you the feasibility of implementing those recommendations. Some of the other sites were the result of the Corps Habitat Evaluation Procedures analysis, and, generally, do not approach restoration on a landscape level.

As we move forward with addressing the current project proposal including the proposed actions in Smith Point County Park we note that during our section 7 analysis we will need to take into consideration that the conditions of the Breach Contingency Plan were not met in the breach filled areas. We strongly advise that this issue be resolved with the local cost share sponsor prior to the start of the 2014 piping plover breeding season (April 1). It would be beneficial for this issue to be resolved prior to any ESA section 7 analysis for this project being undertaken.

Thank you for the opportunity to review your latest plan prior to our meeting next week to discuss habitat restoration/mitigation and ESA conservation measures. If you have any questions, please have your staff contact Trisha Cole of the New York Field Office at 607-753-9334.

Sincerely,

Patricia Cole

for David A. Stilwell
Field Supervisor

cc: NYCOE, NY, NY (L. Houston)

From:	Alan Fuchs
To:	Weppler, Peter M NAN02
Cc:	Anna Servidone; Dawn McReynolds; Susan McCormick; gilbert.anderson@suffolkcountyny.gov
Subject:	[EXTERNAL] Re: FIMI Stabilization at Smith Point County Park - Technical meeting Follow - up
Date:	Friday, January 17, 2014 3:00:46 PM

Peter,
The State and County have reviewed the diagrams for the alignment and have not issues with them.
Al

>>> "Weppler, Peter M NAN02" <Peter.M.Weppler@usace.army.mil> 1/10/2014 10:11 AM >>>
Good Morning and Happy New Year,

As a product of the discussion held at the Dec 18th meeting on subject above, please find attached draft concept drawings for revised dune alignment for Smith Point County Park.

Please note that the dune segments must be straight lines and as shallow transitions as possible, but they can be modified during Plans & Specs for "fine tuning". The back slope can be modified slightly (one on four, or one on three) for a smaller foot print overall.

Your comments are welcome and appreciated by Jan 17, 2014.

Regards,
Peter

Peter Weppler
Chief, Coastal Ecosystem Section
U.S. Army Corps of Engineers - Planning
26 Federal Plaza - Room 2151
New York, NY 10278-0090
Tel: 917-790-8634
Fax: 212-264-0961

From:	Weppler, Peter M NAN02
To:	"david_stilwell@fws.gov"; "Patricia_Cole@fws.gov"; "steve_papa@fws.gov"; "Steve_Sinkevich@fws.gov"; "chris_soller@nps.gov"; "aafuchs@gw.dec.state.ny.us"; "Gilbert.Anderson@suffolkcountyny.gov"
Cc:	Verga, Frank NAN02; Couch, Stephen NAN02; Brighton, Nancy J NAN02; Smith, Robert J NAN02; Ashton, Karen NAN02; Bocamazo, Lynn M NAN02
Subject:	FIMI Stabilization at Smith Point County Park - Technical meeting Follow - up
Date:	Friday, January 10, 2014 10:10:00 AM
Attachments:	SKETCH2C-109-Plot-000.pdf SKETCH2C-108-Plot-000.pdf SKETCH2C-107-Plot-000.pdf SKETCH2C-106-Plot-000.pdf SKETCH2C-105-Plot-000.pdf SKETCH2C-104-Plot-000.pdf

---

Good Morning and Happy New Year,

As a product of the discussion held at the Dec 18th meeting on subject above, please find attached draft concept drawings for revised dune alignment for Smith Point County Park.

Please note that the dune segments must be straight lines and as shallow transitions as possible, but they can be modified during Plans & Specs for "fine tuning". The back slope can be modified slightly (one on four, or one on three) for a smaller foot print overall.

Your comments are welcome and appreciated by Jan 17, 2014.

Regards,
Peter

Peter Weppler
Chief, Coastal Ecosystem Section
U.S. Army Corps of Engineers - Planning
26 Federal Plaza - Room 2151
New York, NY 10278-0090
Tel: 917-790-8634
Fax: 212-264-0961

BIOLOGICAL ASSESSMENT FOR:
PIPING PLOVER (*Charadrius melodus*)
AND SEABEACH AMARANTH (*Amaranthus pumilus*)
FIRE ISLAND INLET TO MORICHES INLET (FIMI)
FEDERAL STABILIZATION PROJECT

U.S. Army Corps of Engineers
New York District

Revised February 2014

1. Purpose and Objectives of the Biological Assessment

This Biological Assessment (BA) has been prepared in accordance with requirements identified in the Endangered Species Act (ESA) of 1973, to identify and discuss potential impacts to Federally-listed threatened and endangered (T&E) species caused by the U.S. Army Corps of Engineers (USACE), New York District (District) activities associated with implementation of the Atlantic Coast of Long Island, Fire Island Inlet to Moriches Inlet (FIMI), New York, Hurricane Sandy Limited Reevaluation Report (HSLRR), Suffolk County, New York (Figure 1). T&E species to be considered for this BA include those species Federally-listed and protected by the U.S. Department of the Interior, Fish and Wildlife Service (USFWS) under the ESA and that have been determined to occur in the project area, which are the piping plover and sea beach amaranth.

In accordance with Section 7(a)(2) of the ESA, as amended, Federal agencies are required to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of any habitat of such species determined to be critical unless an exemption has been granted. Additionally, a Biological Assessment (BA) must be prepared if listed species or critical habitat may be present in an area to be impacted by a "major construction activity." A major construction activity is defined at 50 CFR §402.02 as a construction project (or an undertaking having similar effects) which is a major Federal action significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act (NEPA) (42 U.S.C. 4332(2)(C)).

Objectives for this BA

This BA will facilitate the preparation of the Environmental Assessment (EA) that will identify and evaluate potential environmental impacts associated with the proposed Project and will maintain compliance with Section 7(a)(2) of the ESA. As well as develop a plan to maintain, restore, and enhance populations of listed species through habitat management, research in essential areas including effectiveness and value of habitat management techniques, public outreach and education if necessary.
The BA is designed to provide the USFWS with the required information for their assessment of the effects of the proposed Project on Federally-listed endangered and threatened species.

Specific objectives of this BA are to:

1. Ensure Project actions do not contribute to the loss of viability of T&E species within the project area as well as the New York–New Jersey Piping Plover Recovery Unit;

2. Comply with the requirements of the ESA, as amended, that Project actions do not jeopardize or adversely modify critical habitat for Federally-listed T&E species;

3. Analyze the effects of implementation of Project actions on Federally-listed T&E species;

4. Recommend impact avoidance, minimization, and mitigation measures for Federally-listed T&E species; and:

5. Provide biological input to ensure District compliance with the NEPA and the ESA.

2. Project Area Description

The study area represents an ocean fronting shoreline bounded by two tidal inlets and a backbay mainland area. The study area is within an interconnected system driven by large scale processes with respect to hydrodynamic and sediment exchange, supporting diverse biological and natural resources. Within the study area, ocean shoreline sand generally moves east to west alongshore, in response to waves, and currents during normal conditions and during storms. This longshore movement of sand maintains the prevailing shoreline conditions. In addition to longshore movement, sediment is also exchanged in the cross-shore direction, through erosion and accretion of the beach and dune, exchange of sand through tidal inlets, and during large storm events through the episodic transport of sand over the island through overwash or breaching.

It should be noted that due to the wind and storm surge caused by Hurricane Sandy (2012), numerous overwashes and three breaches occurred on south shore barrier island system of Long Island. Two of those three persistent breaches were on Fire Island and within the boundaries of Fire Island National Seashore: one at Old Inlet (within the Otis Pike Fire Island High Dune Wilderness) and another in Smith Point County Park. In response to breaching of the barrier island, the Department of Environmental Conservation in concert Suffolk County, requested assistance in closing the Smith Point and Cupsoque County Park breaches under the Breach Contingency Plan (BCP). The breaches at Cupsogue County Park and Smith Point County Park and were closed in November 2012 and December 2012, respectively. The breach at the "Old Inlet" area within the Fire Island Wilderness Area is being evaluated by the National Park Service to create a baseline from which to measure changes in the breach. At this time, no closure activities have been initiated. In Fiscal Year 2014, National Park Service received funds to evaluate ecological responses and prepare a NEPA analysis to inform future breach management decisions at Fire Island. Expected date of the draft document for public review is mid 2015.

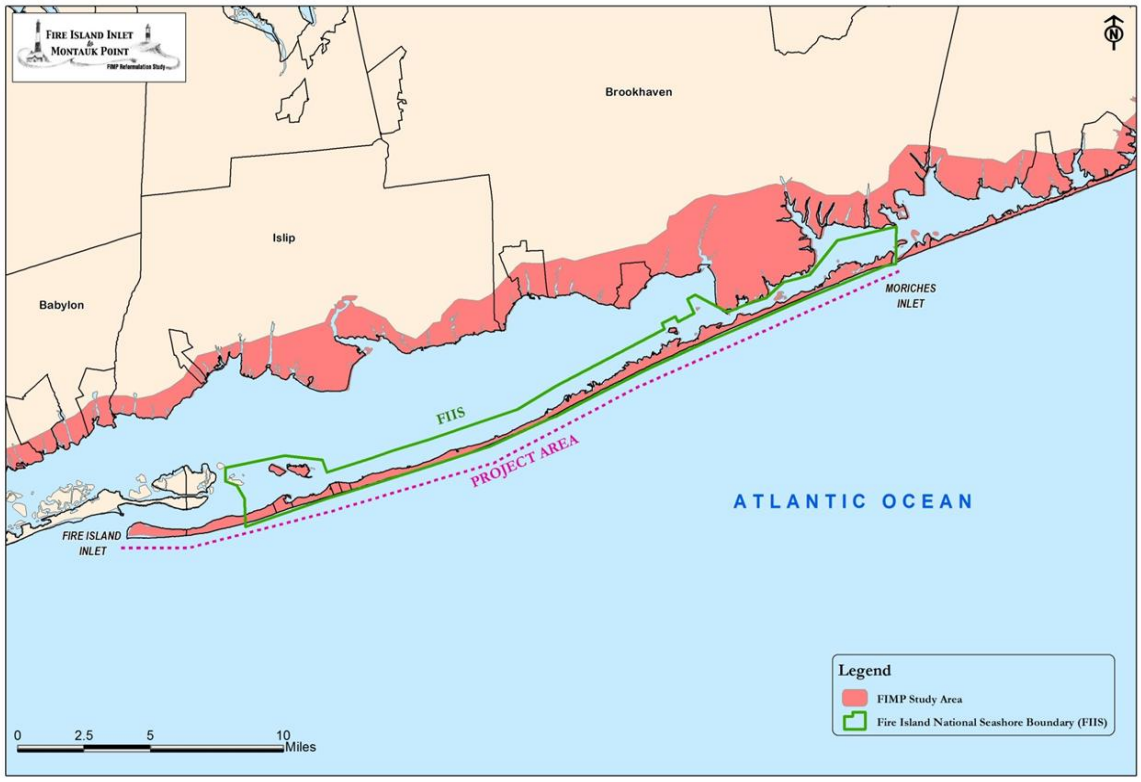
This report provides a Biological Assessment for the Fire Island Inlet to Moriches Inlet (FIMI) Hurricane Sandy Limited Reevaluation Report. FIMI includes portions of the Towns of Babylon, Islip and Brookhaven, as well as two incorporated villages, and the entirety of Fire Island National Seashore (FIIS). The barrier island study area includes Fire Island which extends approximately 30 miles east from Fire Island Inlet to Moriches Inlet (Figure 1). Fire Island Inlet and Moriches Inlet are Federal navigation channels that connect the ocean and the bays. Beaches along the barrier island chain are generally characterized by a well-defined dune system with crest elevations ranging from 6 to 40

feet relative to the National Geodetic Vertical Datum (NGVD). Beach berm widths vary throughout the study area, ranging from approximately 30 feet to 150 feet, with average beach berm elevations of approximately six to ten feet NGVD.

Public lands throughout the Barrier Island Segment provide areas where natural resources are protected to the greatest extent possible. The Nation Park Service (NPS) managed FIIS is located along the Atlantic Ocean on the Fire Island barrier island, Great South Bay, and Moriches Bay shoreline. The NPS seeks, as part of its Mission Statement for FIIS, to preserve natural processes and protect ecological resources. FIIS is approximately 26 miles long, including the 7-mile long Otis Pike Wilderness Area, and includes, at the eastern end, Suffolk County's Smith Point County Park. The property consists of open ocean, marine intertidal, marine beach, dunes and swale, maritime forest, and back bay habitats, as well as primarily seasonal communities.

Along the barrier islands storm damages to developed areas are due to wave attack, erosion of the beach and dune, and tidal flooding of infrastructure on the barrier island that occurs when the beach and dune elevations are exceeded due to hurricanes and nor'easters. There is a long history of building damage during storms. But in addition to storms impacting infrastructure on the barrier island, storms impact the barrier island itself with erosion of the beach and dune system and creation of breaches (new inlets) in the barrier island. When a breach occurs, it impacts both the barrier island and back bay system not only during the storm, but for an extended period after the storm. When a breach opens, it tends to be relatively small, but if not closed quickly, will grow over time. As these breaches grow they also may migrate (move along the island) and can destroy buildings and other infrastructure on the barrier island. Breaches also impact the hydraulic stability of the existing inlets, which can result in increased sediment deposition in the inlet channels, and compromised navigability of the inlet. Of greatest impact however, is the hydrodynamic impact on the back bay. When a breach occurs, it increases flooding in the backbay environment due to tides and major storm activity, and this effect continues to increase as the breach grows. Breaches also change the circulation trends in the estuaries, and also provide a substrate of material in the bay that can contribute to habitat formation.

3. Planning Objectives and Recommended Alternative



Fire Island to Montauk Point (FIMP) Reformulation Study - Project Area

Figure 1

The Stabilization Project has been developed to reinforce the existing dune and berm system along the island. The selected design includes beachfill at Robert Moses State Park, Fire Island Lighthouse Tract, all of the communities outside of Federal Tracts, and Smith Point County Park. Beachfill is not included in any Major Federal Tracts, except as tapers from adjacent communities and in the Fire Island Lighthouse which was requested by the National Park Service to protect the Lighthouse. It should be noted that this Stabilization Plan is consistent with the General Management Plan (GMP) for Fire Island National Seashore (FIIS) which recognizes that not all areas on Fire Island are natural but that the island includes populated areas with established stable communities. The National Park Service (NPS) has policies relating to management of national parks and seashores, such as FIIS. Interference with natural processes in national parks and seashores will be allowed only: 1) when directed by the Congress; (2) in some emergencies when human life and property are at stake; (3) to restore native ecosystem functioning that has been disrupted by past or ongoing human activities, or (4) when a park plan has identified the intervention as necessary to protect other park resources, human health and safety, or facilities. One of the planning premises is "Fire Island is a culturally manipulated barrier-island system, and it cannot be managed as if natural geomorphic processes had been totally unimpeded." The GMP also recognizes that much

of the island has been altered by human habitation. These alterations have disturbed the natural morphology and coastal processes. The GMP makes allowances "to restore and maintain the dune and beach system by environmentally compatible methods."

Alternatives

The Environmental Assessment for the project evaluated two alternatives, the No Action Alternative and a Beach Fill Alternative. The beach fill alternative is the recommended alternative and is the environmentally preferred plan because it reduces storm damages in a manner that mimics the natural protective features of the barrier island.

No Action Alternative

Under the No Action Alternative, the Corps of Engineers and the Federal government would take no action to reduce storm damages in the study area. It is recognized that in the absence of Federal action that Local Governments and non-Governmental groups, such as homeowner associations could take actions to protect themselves by undertaking their own construction projects to build up the beach and dune profiles. Although these actions are likely to occur, these have not been included in the no action alternative, for purposes of this analysis.

FIMI Stabilization Beach Fill Alternative - Tentatively Selected Plan (TSP)

The FIMI project area is divided into the Smith Point County Park, Communities, and Robert Moses areas. In general, the beach fill alternative consists of placement of sand from nearby offshore borrow areas, on the ocean side of Fire Island to restore a beach and dune system to minimize breaching and overwash, thereby affording provisional storm damage protection to communities and ecosystems (such as the Fire Island Wilderness Area) within the Study Area.

In the areas with the greatest potential for damages to oceanfront structures (Kismet to Lonelyville, Town Beach to Corneille Estates, Ocean Beach to Seaview, Ocean Bay Park to Point O' Woods, Cherry Grove, Fire Island Pines, Water Island, Davis Park, and the western section of Smith Point County Park), the selected plan includes the construction of a beach berm with a width of 90 feet at elevation +9.5 feet NGVD and a dune with a crest width of 25 feet at elevation +15 feet NGVD.

In eastern Smith Point County Park, the Fire Island Lighthouse Tract, and portions of Robert Moses State Park, the selected plan includes the construction of a beach berm with a width of 90 feet at elevation +9.5 feet NGVD and a dune with a crest width of 25 feet at elevation +13 feet NGVD. In four locations within these areas (in the areas of New Made Island, Lighthouse tract, the recently closed Smith Point County Park breach, and Pattersquash Island) the dune will be sloped 1 on 10 and the vegetation (not within the Lighthouse Tract) will be keep at 30-40% coverage to maintain high quality nesting habitat and unrestricted travel corridors for the adult piping plovers and their chicks to reach feeding habitat on the ocean and bay shores.

In western sections of Robert Moses State Park and the TWA Memorial Area of Smith Point County Park (where this is existing high ground elevations), the selected plan includes the construction of a beach berm with a width of 90 feet at elevation +9.5 feet NGVD.

In several areas, the dune alignment and associated tapers have been adjusted per consultations with U.S. Fish and Wildlife Service and National Park Service in order to address park objectives. The selected alignment requires a total of approximately 41 real estate acquisitions and 7 real estate relocations (6 structures and relocation/reconstruction of the Ocean Beach well complex component). The majority of the acquisitions are in either Ocean Bay Park (19) or Davis Park (19). The other three acquisitions are located in Dunewood (2) and Robbins Rest (1). The proposed relocations are located in Davis Park (3), Fire Island Pines (2), Saltaire (1) and Ocean Beach (1). The Ocean Beach real estate relocation includes the water supply. Beach fill tapers are also proposed in several locations within Federal Tracts to avoid and lessen the end losses of the proposed project's dune and berm features.

Beach Fill Profiles of the FIMI TSP

Beachfill (berm only) and beachfill with dunes have been designed for the Atlantic Ocean shorefront as storm damage reduction features. Varying levels of protection have been developed suitable for locations across the study area. The alternative design sections selected for the FIMI Stabilization Project are summarized as follows:

- "Berm Only": a berm width of 90 ft. at elevation +9.5 ft. NGVD and no dune behind the berm.

- "Small" fill template or Lower Level of Protection (LLP): a berm width of 90 ft. at elevation +9.5 ft. NGVD and a low dune with a crest width of 25 ft. at an elevation of +13 ft. NGVD.

- "Medium" level of protection template: a berm width of 90 ft. at an elevation +9.5 ft. NGVD and medium dune with a crest width of 25 ft. at an elevation of +15 ft. NGVD.

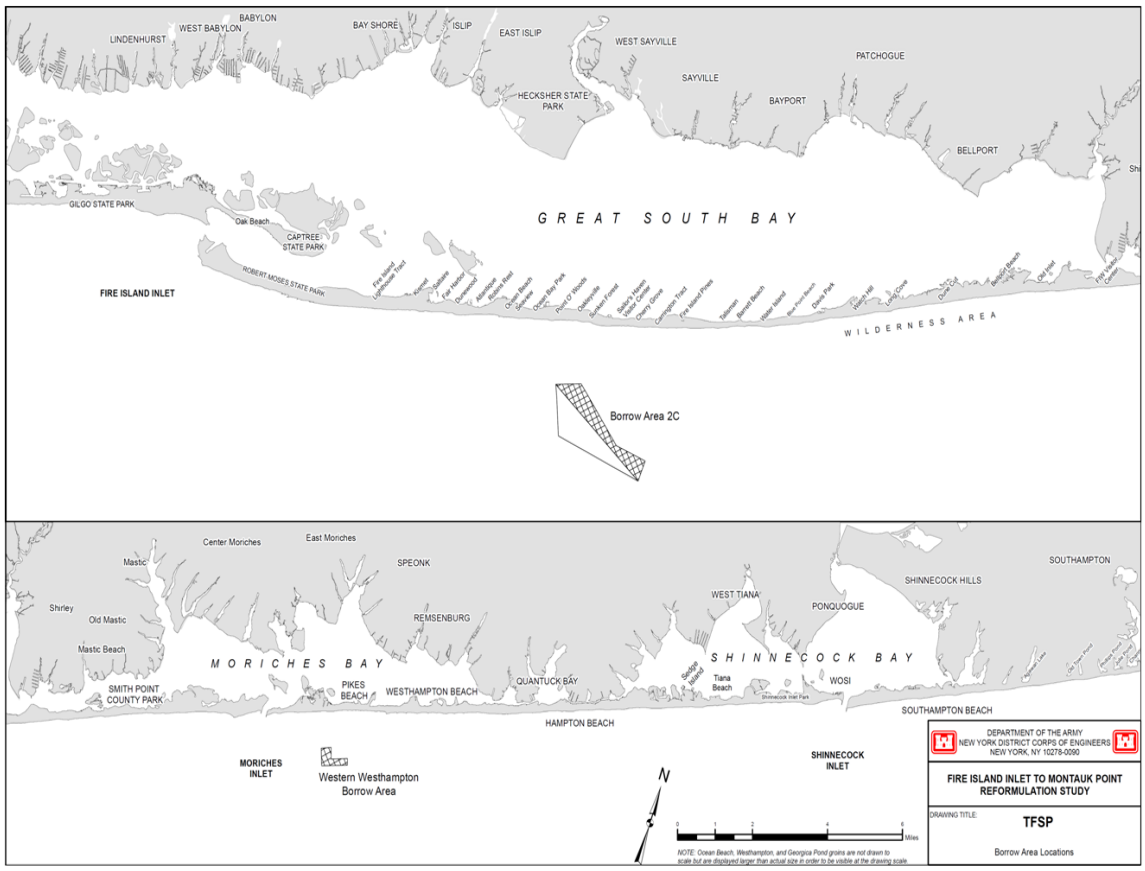


Figure 2 – Selected Plan Borrow Area Locations

The sand required for initial construction will be obtained from two offshore borrow sites: 2C and 4C (Figure 2). Borrow area 2C is located approximately 2 miles offshore of Point O' Woods and contains an estimated 9,000,000 cy of compatible sediment. In order to limit potential impacts to shoreface ridges containing modern Holocene sediments only the northeastern half of borrow area 2C will be dredged. Borrow area 4C is located approximately 1.5 miles offshore of Pikes Beach and contains an estimated 2,000,000 cy of compatible sediment. Sand will be dredged offshore by a hopper dredge, sailed to a pump out location, and placed hydraulically on the beach. Earth moving equipment, such as dozers and excavators, will be used for final shaping. Borrow area 2C and 4C have both been previously permitted for dredging.

Fire Island National Seashore received emergency Hurricane Sandy funds from the Federal Highway Administration's Eastern Federal Lands Division to dredge approximately 60,000 cubic yards from the Seashore's Watch Hill boat channel and marina. Currently, the plans are to undertake dredging during the channel's fall dredge window of 2014 (October 1- December 15) which would coincide with the Stabilization Project's proposed construction schedule. While the Watch Hill project 's objective is to re-establish the channel for safe passage by all users of the channel, it also outlines the beneficial use of the dredged material by either stockpiling or placement in permitted areas.

NPS is proposing that the 60,000 cubic yards be beneficially placed to create a feeder beach with a berm elevation not to exceed 9.5 ft. NGVD on the first 1500 feet of the eastern end of Davis Park. This action will augment the Stabilization Project's need for sand within Davis Park. NPS is proposing that the pipeline from the channel to the placement site will be positioned on public land (Federally or locally permitted).

In areas where there is either an insignificant risk of breaching, no oceanfront structures, or relatively few structures (areas of low damages; e.g., Sunken Forest, Wilderness Area - West), beach fill is not proposed for this project. The alignment of the FIMI TSP has been optimized to the existing barrier island profile and minimizes shifting the whole beach fill alignment seaward to protect solitary or few structures that are set apart from other structures. This alignment results in the necessity to relocate or remove some structures. The following is from the Hurricane Sandy Limited Revaluation Report detailing the alternative for the Stabilization project.

Design Section

The *Berm Only, Small*, and *Medium* design templates are used in the FIMI TSP. The proposed design foreshore slope (from +9.5 to +2 ft. NGVD) is roughly 12 on 1. Below MHW (roughly +2 ft. NGVD) the submerged morphological profile, representative of each specific reach, is translated and used as the design profile. Figure 3 shows typical design sections for a few reaches considered representative of the complete set of reaches where fill placement is considered.

- The *Berm Only* template is applicable to areas in which the existing condition dune elevation and width reduce the risk of breaching but have eroded beach berm conditions. The 90 ft. design berm provides protection to the existing dunes and ensure vehicular access during emergency response and evacuation. The *Berm Only* template is applied to Robert Moses State Park (GSB-1A) and Smith Point Count Park-TWA (MB-1A). At Smith Point County Park the design provides protection to the existing park facilities and TWA Memorial.

- The *Small* template is sufficient to reduce the risk of breaching but does not prevent a significant portion of the damages to oceanfront structures. Therefore, the *Small* template is applied to areas with limited oceanfront structures: Robert Moses State Park (GSB-1A), Fire Island Lighthouse Tract (GSB-1B), and the eastern section of Smith Point County Park (MB-1B, and MB-2A).

- The *Medium* template was identified as having the highest net benefits and provides for non-overtopping of an event with an approximate 50-year return period. The *Medium* template is applied to the areas with the greatest potential for damages to oceanfront structures: Kismet to Lonelyville (GSB-2A), Town Beach to Corneille Estates (GSB-2B), Ocean Beach to Seaview (GSB-2C), Ocean Bay Park to Point O' Woods (GSB-2D), Cherry Grove (GSB-3A), Fire Island Pines (GSB-3C), Water Island (GSB-3E), Davis Park (GSB-3G), and the western

section of Smith Point County Park (MB-1A). The FIMI TSP does not include beachfill in any Major Federal Tracts except Fire Island Lighthouse Tract, which suffered significant beach and dune erosion during Hurricane Sandy. The Major Federal Tracts are: (Sailors Haven (GSB-2E), Carrington Tract (GSB-3B)), Talisman to Water Island (GSB-3D)), Water Island to Davis Park (GSB-3F), Watch Hill (GSB-3H), Bellport Beach (GSB-4A), and Old Inlet (GSB-4B). Table 1 provides an overview of the dune elevations by location along the selected plan.

Table 1 – Overview of Selected Design Sections

Design Reach	Location	Length (ft.)	Dune Elevation (ft. NGVD)
GSB-1A	RMSP	23,200	-
GSB-1B	FILT	5,400	13
GSB-2A	Kismet to Lonelyville	9,000	15
GSB-2B	Town Beach to Corneille Estates	4,400	15
GSB-2C	Ocean Beach to Seaview	3,800	15
GSB-2D	OBP to POW	7,200	15
GSB-3A	Cherry Grove	3,000	15
GSB-3C	Fire Island Pines	6,400	15
GSB-3E	Water Island	2,000	15
GSB-3G	Davis Park	4,200	15
MB-1A	SPCP-TWA	6,400	-
MB-1B	SPCP	13,000	13
MB-2A	MB-2A	7,800	13

Alignment

The beachfill alignment or baseline defines the cross-shore location of design section. The design sections are oriented to the baseline by setting the centerline of the design dune coincident with the baseline. In the absence of oceanfront real estate, the most cost effective alignment is one that ties into the existing dune line and extends seaward from the existing shoreline only the distance necessary to achieve the required level of protection.

The selected beachfill alignment, Updated Middle Alignment (MIDU), preserves as much as possible the existing (Post-Hurricane Sandy) dune alignment while balancing the cost of acquiring or relocating oceanfront structures versus increased renourishment needs. The selected alignment requires a total of 41 real estate acquisitions and 7 real estate relocations. The majority of the acquisitions are in either Ocean Bay Park (19) or Davis Park (19). The other three acquisitions are located in Dunewood (2) and Robbins Rest (1). The proposed relocations are located in Davis Park (3), Fire Island Pines (2), Saltaire (1) and Ocean Beach (1). The Ocean Beach real estate relocation includes the water

supply. Detailed plan layouts (1 on 100 scale) of the initial construction increment are presented in Attachment A of this report.

Advance Fill

To ensure the integrity of the design fill cross-section advance fill will be placed along the proposed project shoreline. Advance fill is a sacrificial quantity of sand which acts as an erosional buffer against long-term and storm-induced erosion as well as beachfill losses cause by "spreading out" or diffusion. The required advance berm width was computed based on representative erosion rates for each beachfill. The representative erosion rates were calculated based on the historical sediment budget, the performance of recent beach fill projects on the island, and anticipated beachfill spreading.

Fill Volumes

The total initial project fill volume is the sum of the design fill, advance fill, and overfill and contingency. The total initial fill volumes for each design reach are presented in Table 2. The total initial fill volume for the initial construction increment is estimated at approximately 6,992,145 cy.

Conservation Measures/Project Design Adjustments (to offset potential impacts to listed species)

The Proposed Project includes a number of Conservation Measures (found later in this document) to avoid or minimize adverse effects of beach nourishment projects to the listed species (piping plover and seabeach amaranth). Specifically discussed here are the physical adjustments to the Recommended Alternative.

Detailed taper information contained within the attached plan sheets (Attachment A):
C17 - Current design acceptable
C18 - Change taper to 300' -- end at 607+00
C19 - Change taper to 300' -- end at 643+00 (last full section at 640+00)
C20 - Change taper to 300' -- end at 655+00 (last full section at 658+00), last two properties are owned by the federal government so end dune at 658+00
C22 - Current design acceptable
C23 - Change taper to 200' -- end at 789+00
C24 - Change taper to 300' -- end at 813+50
C25 - Change taper to 300' -- end at 853+50
C27 - Change taper to 300' -- end at 901+20
C28 - End taper at 1294+00 (last full section at 1297+00)

Detailed Dune Alignment and slopes:

Lighthouse Tract:
From Station 223+50 to 274+50
Straight dune alignment (alignment based upon aligning the seaward toe of the dune). Dune template from original toe of dune with a 1V:10H seaward slope, 25 ft crest width, and 1V:10H (see Figure 4) landward slope to intersection of existing topography.
East of 274+50, 1V:5H slopes of dune (seaward dune toe to match alignment.

West of Robbins Rest:
Realigned dune to maximize beach habitat, as shown on Sheet C-12, with slopes as shown (1V:5H)

All other Communities' dunes:
Standard alignment and slopes.

Smith Point County Park:

- Dune as shown, from Station 151+00 to 1386+00, 1V:5H slopes of dune (seaward dune toe to match alignment.)

- From Station (**Pattersquash**) 1386+00 to 1420+00, revert to straight dune alignment, (alignment based upon aligning the seaward toe of the dune). Create dune template from original toe of dune, with 1V:10H seaward slope, 25 ft crest width, and 1V:10H landward slope to intersection of existing topography.

- From Station 1420+00 to 1443+00, dune as shown, 1V:5H slopes of dune (seaward dune toe to match alignment.)

- From Station (**recently closed Smith Point Breach**) 1445+00 to 1465+00, revert to straight dune alignment, (alignment based upon aligning the seaward toe of the dune). Create dune template from original toe of dune, with 1V:10H seaward slope, 25 ft crest width, and 1V:10H landward slope to intersection of existing topography.

- From Station 1465+00 to 1486+00, dune as shown, 1V:5H slopes of dune (seaward dune toe to match alignment.)

- From Station (**New Made Island**) 1486+00 to 1515+00, revert to straight dune alignment, (alignment based upon aligning the seaward toe of the dune). Create dune template from original toe of dune, with 1V:10H seaward slope, 25 ft crest width, and 1V:10H landward slope to intersection of existing topography.

- From Station 1515+00 to 1534+50, dune as shown, 1V:5H slopes of dune (seaward dune toe to match alignment.)

- East of Station 1534+50 east of Great Gun, an approximate 39 Acre area will be de-vegetated to provide habitat for endangered species

Anticipated Construction Schedule

The proposed construction schedule below can be referenced to the attachments for construction dates in specific areas (MB-1A, GSB-1B, etc.):

Smith Point County Park

- Contract 1: Smith Point County Park (MB-1A, MB-1B, MB-2A): Contract 1: September 2014 to February 2015

Robert Moses Area

- Contract 2: Lonelyville to Robert Moses State Park (GSB-1A, GSB-1B, GSB-2A): November 2014 to March 2015

Communities

- Contract 3: Davis Park to Town Beach (GSB-2B, GSB-2C, GSB-2D, GSB-3A, GSB-3C, GSB-3E, GSB-3G): Contract 3: December 2014 to August 2015

Figure 3 – Typical Beachfill Section

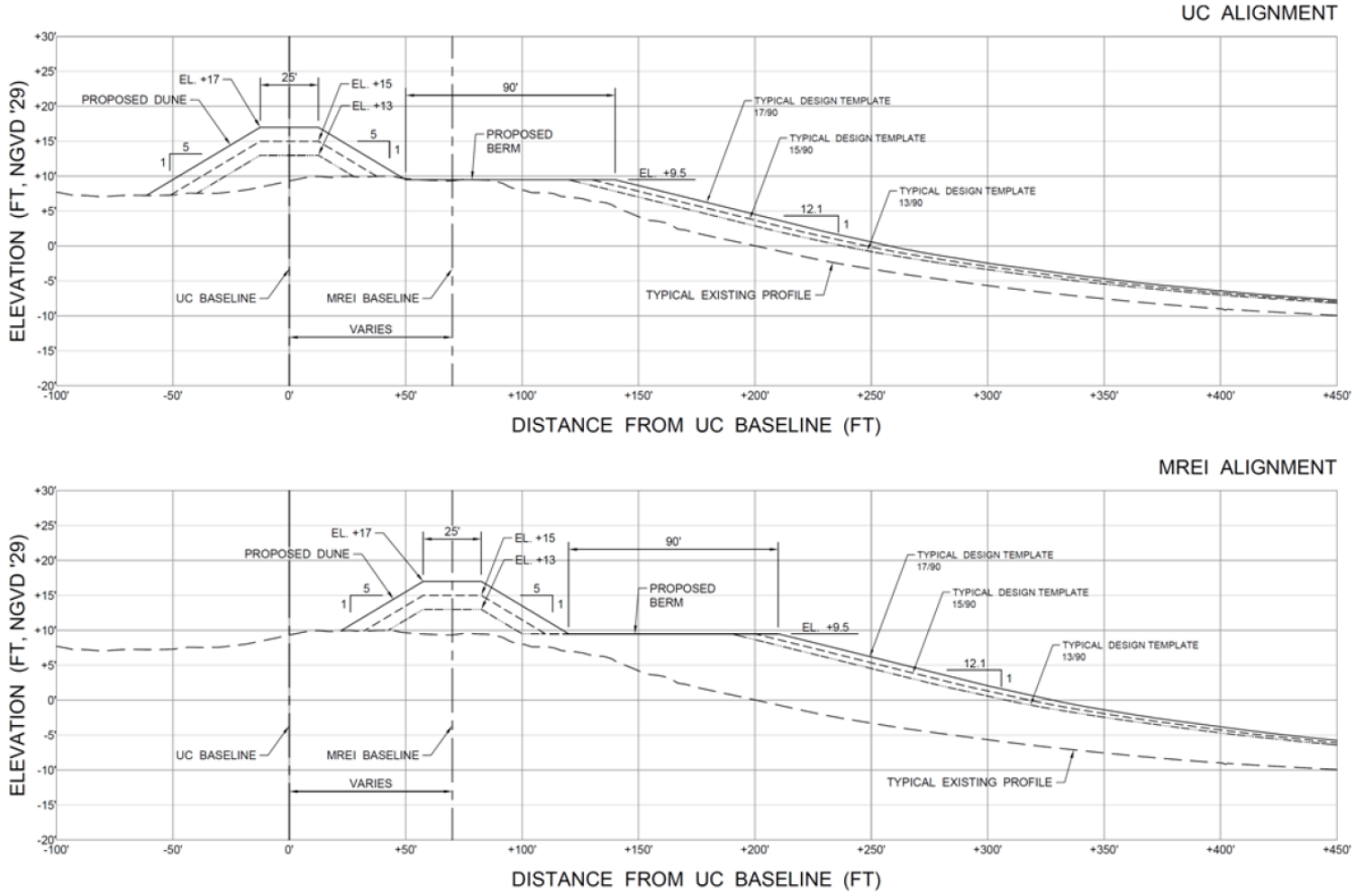


Figure 4 – Beachfill Section for Conservation Measures

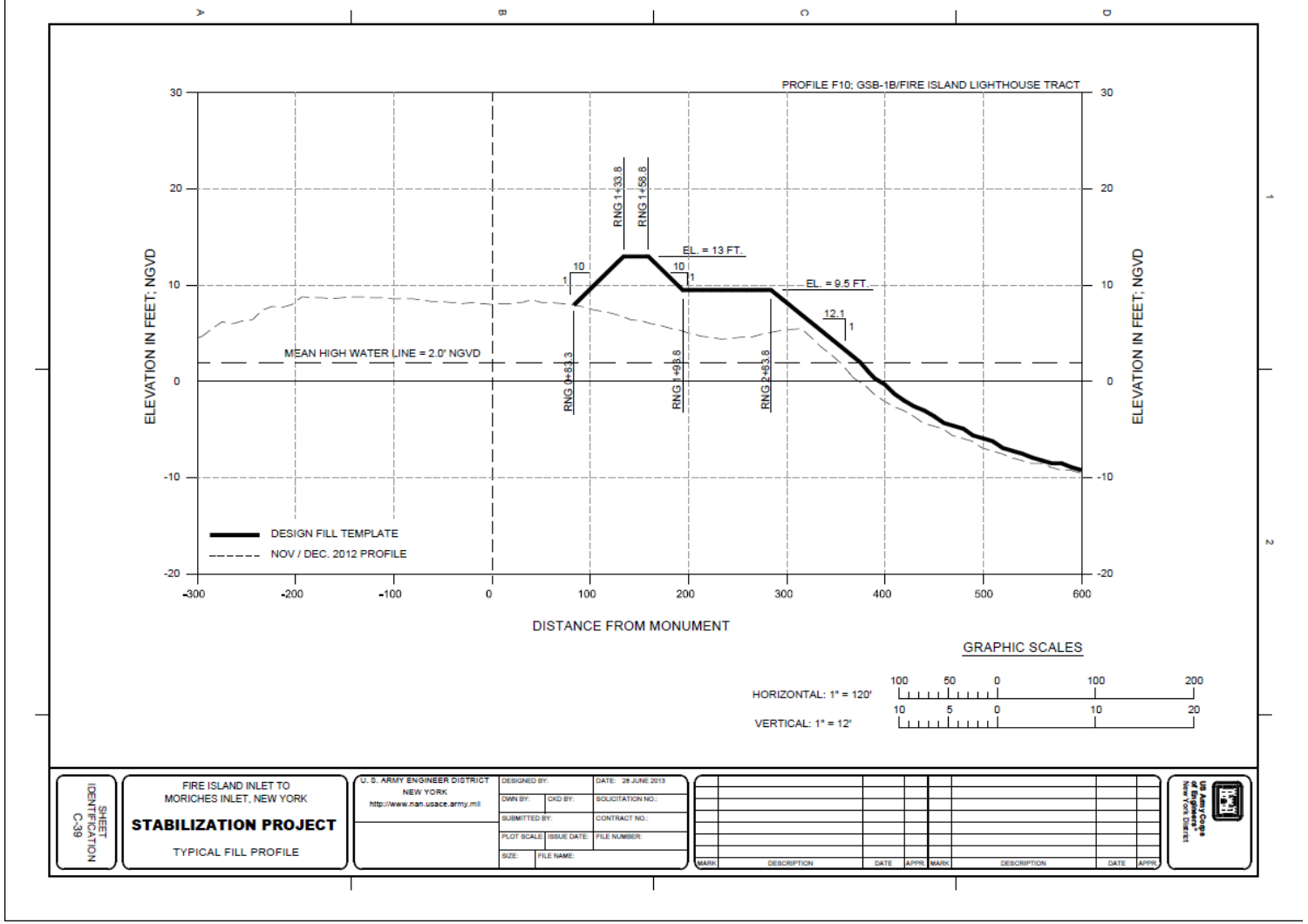


Table 2 – Fill Volumes by Design Reach - FIMI TSP

Location	Design Reach	Fill Length (ft)	Design Fill Volume (cy)	Advance Fill Volume (cy)	10% Overfill Factor (cy)	Subtotal Volume (cy)	15% Contingency (cy)	Total Initial Fill (cy)
RMSP	GSB-1A	16,562	458,164	110,942	56,911	635,238	95,286	730,524
FILT	GSB-1B	5,461	253,025	98,301	35,133	386,459	57,969	444,428
Kismet to Lonelyville	GSB-2A	8,918	200,098	109,770	30,987	340,855	51,128	391,983
Town Beach to Corneille Est.	GSB-2B	4,529	313,822	92,548	40,637	447,008	67,051	514,059
Ocean Beach to Seaview	GSB-2C	3,752	147,569	75,401	22,297	245,267	36,790	282,057
OBP to POW	GSB-2D	7,228	250,258	97,956	34,821	384,077	57,612	441,689
Cherry Grove	GSB-3A	2,950	10,278	0	1,028	14,041	2,106	16,147
Fire Island Pines	GSB-3C	6,457	549,255	346,159	89,541	1,029,435	154,415	1,183,850
Water Island	GSB-3E	1,196	30,676	9,127	3,980	59,670	8,951	68,621
Davis Park	GSB-3G	4,167	305,013	215,297	52,031	639,880	95,982	735,862
SPCP-TWA	MB-1A	6,342	265,725	13,872	27,960	373,830	56,075	429,905
SPCP	MB-1B	13,095	681,702	96,696	77,840	856,239	128,436	984,675
Great Gun	MB-2A	4,461	525,019	43,725	56,874	668,126	100,219	768,345
Total		**85,118**	**3,990,604**	**1,309,794**	**530,040**	**6,080,125**	**912,020**	**6,992,145**

4. Description of Habitats and Species

Oceanfront beach and deepwater ocean habitats constitute the majority of the Project Area. The beach community includes upper, intertidal, and nearshore subtidal areas. Dunes range in height from +13.5 to +20 ft NGVD and have an average height of +17.75 NGVD.

Habitat Types

The **upper beach** zone extends from dune areas to just above the high water line and includes dunes and supratidal areas of the beach. The upper beach area is dominated by a sandy substrate and is generally vegetated. Vegetation is dominated by beach grass (*Ammophila breviligulata*), but may also include cover of spurge (*Euphorbia polygonifolia*), beach plum (*Prunus maritima*), seaside goldenrod (*Solidago sempervirens*), beach heather (*Hudsonia tomentosa*), and sea rocket (*Cakile edentula*). Vegetation on stable foredunes is denser than that of the upper beach area (up to 50% vegetated cover), and includes similar species. Mixed herb/shrub communities dominate dune crests and protected areas behind dunes. Common species include the herbs found in foredune areas and shrubs such as bayberry *(Myrica pensylvanica),* shadbush (*Amelanchier Canadensis)* and multiflora rose (*Rosa multiflora*).

The **intertidal zone** extends from the low tide line to the high tide line and is submerged and exposed according to daily tidal cycles. The zone is unvegetated and consists of fine-grained sand substrate. Wrack and ocean debris are common within this zone. Species diversity is relatively low due to limited ability of species to withstand the daily submersion and exposure. Micro and macro-invertebrates known to inhabit this zone include crabs, shrimp, bivalves, and worms. The intertidal zone provides key foraging habitat for shorebirds/seabirds, which feed on these organisms.

The affected near shore subtidal zone extends from the low water line down to 25 ft below mean low water (MLW) and is nearly continuously submerged. The zone is unvegetated and consists of a sand substrate. The area contains a rich diversity of species including but not limited to crabs, shrimp, bivalves, worms, and finfish. In addition, man-made groins extend from the intertidal zone into the subtidal zone from 200 to 600 feet. These structures provide habitat for numerous fish, macro-invertebrates, and birds. Human use of unrestricted areas of these zones is high and the upper beach area is subjected to periodic beach raking in some areas during the summer months.

Finfish and Shellfish

The nearshore waters of the Project Area support seasonally abundant populations of many recreational and commercial finfish. Primary recreational fish species include black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudopleuronectes americanus*), weakfish (*Cynosion regalis*), bluefish

(*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), striped bass (*Morone saxatillis*), and Atlantic mackerel (*Scomber scombrus*). Nearshore waters also contain a number of migrant anadromous and catadromous species such as the Atlantic sturgeon (*Acipenser oxyhinchus*), blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), striped bass, and American eel (*Anguilla rostrata*) (Woodhead 1992).

Invertebrate Communities

The benthic community of the greater Project Area is dominated by polychaetous annelids, followed by malacostracans, bivalves, and gastropods (Reid et al. 1991, Ray and Clarke 1995, Ray 1996, USACE 2005). Common shellfish species in the Project Area are the mole crab (*Emerita talpoida*), hardshell clam (*Mercenaria mercenaria*), softshell clam (*Mya arenaria*), telling (*Tellina agilis*), razor clam (*Ensis directus*), rock crab (*Cancer irroratus*), lady crab (*Ovalipes ocellatus*), American lobster (*Homarus americanus*), hermit crab (*Homarus americanus*) and blue crab (*Callinectes sapidus*). Mussels (*Mytilus* spp) dominate man-made structures such as groins and jetties in the Project Area. Ghost crabs (*Ocypode* spp) and sand fleas (*Talorhestia* spp.) dominate the beach community.

Reptiles and Amphibians

Adjacent development, lack of habitat, and high recreational use, limit the value of the Project Area for many wildlife species. Based on an evaluation of the habitats available in the Project Area and results of studies conducted within similar habitats on Fire Island, New York, no amphibians or reptiles are expected to inhabit the Project Area.

Several Federally-listed species of marine turtles may be present in offshore, and possibly nearshore waters near the Project Area during various times of the year (NMFS 1993). Coordination with NMFS is ongoing throughout the development of the project as well as our Biological Opinion (BO) dated December 15, 1995 ("Biological Opinion on Beach Nourishment Projects- South Shore of Long Island and Northern New Jersey Shore, Sandy Hook and Manasquan").

Mammals

Based on an evaluation of the habitats available in the Project Area and results of studies conducted within similar habitats on Fire Island, New York, the most common mammalian species likely to inhabit the general Project Area include habitat generalists that are able to tolerate development and active human use of the area (Brotherton et al. 2003, USFWS 1982). Species include the white-footed mouse (*Peromyscus leucopus),* eastern cottontail (*Sylvilagus floridanus*), house mouse (*Mus musculus),* Norway rat *(Rattus norvegicus),* red fox (*Vulpes vulpes),* gray squirrel (*Sciurus carolinensis*) and feral cat (*Felis catus*).

Based on studies conducted in the Project Area, a wide diversity of bird species are likely to occur in the vicinity of the Project Area (USACE 2003, USFWS 1982). However, as

with mammalian species, the most abundant bird species are common habitat generalists that are tolerant of development and that can utilize the shoreline and deepwater habitats. Common avian species of the Project Area and surrounding areas (ocean and residential/commercial areas) include herring gull (*Larus argentatus*), greater black-backed gull (*Larus marinus*), yellow-rumped warbler (*Dendroica coronata*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), barn swallow (*Hirundo rustica*), black-bellied plover (*Pluvialis squatarola*), black scoter (*Melanitta nigra*), bufflehead (*Bucephala albeola*), common grackle (*Quiscalus quiscula*), common yellowthroat (*Geothlypis trichas*), dark-eyed junco (*Junco hyemalis*), double-crested cormorant (*Phalacrocorax auritus*), European starling (*Sturnus vulgaris*), gray catbird (*Dumetella carolinensis*), mourning dove (*Zenaida macroura*), eastern towhee (*Pipilo erythrophthalmus*), song sparrow (*Milospiza melodia*), and tree swallow (*Iridoprocne bicolor*). Listed or special concern bird species observed during surveys conducted on Fire Island (from Robert Moses State Park to Southampton Beach, NY) included Piping Plover, common tern, least tern, and black skimmer (USACE 2003). Extensive use of the beach and dune areas for public recreation limits the potential for nesting and limits use of much of the Project Area by birds to resting and feeding.

Significant Habitats

Based on a review of the National Oceanic and Atmospheric Administration (NOAA) guide to Essential Fish Habitat (EFH) designations in the Northeastern United States, designated EFH habitat does occur in the Project Area (NMFS 2004). EFH is defined by congress as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10). The District is consulting with NOAA on finalizing the EFH determination.

Listed Species

The Federally and state-listed Piping Plover, sea beach amaranth, and roseate tern, as well as the state-listed common tern and least tern, and the state species of special concern black skimmer, all nest or carry out a major portion of their life cycle activities (i.e., breeding, resting, foraging) within essentially the same habitat (Table 4). This habitat encompasses areas located between the high tide line and the area of dune formation and consists of sand or sand/cobble beaches along ocean shores, bays and inlets and occasionally in blowout areas located behind dunes (Bent 1929, NatureServe 2002, NJDEP 1997, USFWS 2004a).

Table 4. Protection Status of Species that Utilize Habitats Similar to those in the Project Area.

Common Name	Federal Status	State Status
Common Tern	Not Listed	Threatened
Least Tern	Not Listed	Threatened
Piping Plover	Threatened	Endangered
Roseate Tern	Endangered	Endangered
Seabeach Amaranth	Threatened	Threatened

List of Species

The USFWS, through its consultation with the District regarding implementation of the Project has identified four T&E species as being present on or near the Project Area (see Table 4.). Based on habitat and life history assessments, recommendations from the USFWS and a site assessment conducted by the USACE, the District has determined that the following Federally-listed species (with their respective recent population numbers below them) are likely to occur in the FIMI Project Area and warrant a Biological Assessment:

- Piping Plover (*Charadrius melodus*),
- Seabeach Amaranth (*Amaranthus pumilus*)

2013: Piping plovers: 11 nesting pairs, 7 fledglings
Seabeach amaranth: 15 individuals

2012: Piping plovers: 12 nesting pairs, 15 fledglings
Seabeach amaranth: 26 individuals

2011: Piping plovers: 14 nesting pairs, 14 fledglings
Seabeach amaranth: 40 individuals

2010: Piping plovers: 17 nesting pairs, 17 fledglings
Seabeach amaranth: 11 individuals

2009: Piping plovers: 19 nesting pairs, 13 fledglings
Seabeach amaranth: 78 individuals

https://irma.nps.gov/App/Portal/Home

The state-listed common tern (*Sterna hirundo*) and the least tern (*Sterna antillarum*) and roseate tern (*Sterna dougallii*), which utilize beach habitat similar to that of the Piping

Plover and Seabeach Amaranth, have been identified as species that may occur in the Project Area. Additionally, the state species of special concern, black skimmer (*Rynchops niger*), also is known to nest on coastal beaches and frequently nests in or near tern nesting areas. None of these species have yet been identified by the USFWS as species requiring further ESA consultation or Biological Assessment. However, measures taken to avoid and protect plover and seabeach amaranth habitats would benefit and protect these species as well.

Life Stages of Listed Species

Piping Plover

Listing

On January 10, 1986, the Piping Plover was listed as threatened and endangered under provisions of the ESA. Protection of the species under the ESA reflects its precarious status range-wide. Three distinct populations were identified by the Service during the listing process: Atlantic Coast (threatened), Great Lakes (endangered), and Northern Great Plains (threatened). The Atlantic Coast population, which is the focus of this biological opinion, breeds on coastal beaches from Newfoundland to North Carolina (and occasionally in South Carolina) and winters along the Atlantic Coast from North Carolina southward, along the Gulf Coast, and in the Caribbean. No critical habitat, as defined by the ESA, has been designated for the Atlantic Coast population (U.S. Fish and Wildlife Service 1996a). The "Piping Plover *(Charadrius melodus*) Atlantic Coast Population Revised Recovery Plan" (hereafter referred to as the "Piping Plover Recovery Plan") found in U.S. Fish and Wildlife Service (1996a) delineates four Recovery Units, or geographic sub-populations, within the Atlantic Coast population: Atlantic Canada, New England (including Massachusetts, Maine, New Hampshire, Rhode Island, and Connecticut), New York-New Jersey (NY-NJ), and Southern (including Delaware, Maryland, Virginia, and North Carolina).

Life History

The piping plover is a small robin-sized shorebird 17–18 cm (7.25 in) in length, a wingspan of 47 cm (19 in), and an average weight of 55 g (1.9 oz) (Sibley 2000). Piping plover breed and nest on coastal beaches from Newfoundland and southeastern Quebec to North Carolina and winter primarily on the Atlantic coast from North Carolina to Florida. Along the Atlantic coast, plover nest mainly on gently sloping foredunes above the high tide line, in blow-out areas behind primary dunes of sandy coastal beaches, and on uitable dredge spoil deposits (USFWS 1988, Cashin Associates 1993, NPS 1994). Nests are usually found in sandy areas with little or no vegetation. Vegetation, when present, consists of beach grass, sea rocket, and/or seaside goldenrod.

Plover begin northward migration to breeding grounds from southern U.S. wintering areas in March, and arrive on nesting grounds from March – May; males arrive prior to females. Fall migration to southern wintering grounds begins in mid- to late summer. Juvenile plover may remain on breeding grounds later but are generally gone by mid- to late August (Cuthbert and Wiens 1982). Atlantic coast breeders migrate primarily to Atlantic coast sites located farther south of breeding areas (i.e., Virginia to Florida, Bahamas) (Haig and Oring 1988, Haig and Plissner 1993).

The breeding season begins when adult plover reach the breeding grounds in mid- to late-April or in mid-May in northern parts of the range. The adult males arrive earliest, select beach habitats, and defend established territories against other males (Hull 1981). When adult females arrive at the breeding grounds several weeks later, the males conduct elaborate courtship rituals including aerial displays of circles and figure eights, whistling song, posturing with spread tail and wings, and rapid drumming of feet (Bent 1929, Hull 1981).

Plover typically return to the same general nesting area in consecutive years (but few return to natal sites). Plover are known to shift breeding location by up to several hundred kilometers between consecutive years. However, Wilcox (1959) has shown that only 20 percent settle at a nest site farther than 1,000 ft from the previous year's locality. Adult females tend to choose new nest sites within the same geographic area with over 50 percent choosing a new nest site over 1,000 ft from the previous year. Previous reproductive success apparently does not increase the probability of returning to specific breeding sites (NatureServe 2002).

Nest sites are simple depressions or scrapes in the sand (Bent 1929, Wilcox 1959). The average nest is about 6 to 8 cm in diameter, and is often lined with pebbles, shells, or driftwood to enhance the camouflage effect. Males make the scrapes and may construct additional (unused) nests in their territories, which may be used to deceive predators or may simply reflect over-zealousness (Wilcox 1959, Hull 1981). Occupied nests are generally 50 to 100 meters apart (Wilcox 1959, Cairns 1977, Cuthbert and Wiens 1982).

Egg-laying commences soon after mating (Hull 1981, Cuthbert and Wiens 1982). Eggs are laid every second day. The average clutch size is four eggs (Wilcox 1959) and three-egg clutches occur most commonly in replacement clutches. The average number of young fledged per nesting pair usually is two or fewer. The young hatch about 27 to 31 days after egg laying. Incubation is shared by both adults (Wilcox 1959, Hull 1981).

Young plover leave the nest about two hours after hatching and immediately are capable of running and swimming. The young usually remain within about 200 meters of the nest, although they do not return after hatching (Wilcox 1959, Johnsgard 1979, Hull 1981). When disturbed or threatened, the young either freeze or combine short runs with freezing and blend very effectively into their surroundings (Wilcox 1959, Hull 1981). Adults will feign injury to draw intruders away from the nest or young (Bent 1929,

Wilcox 1959). Adults also defend the nest territory against other adult piping plovers, gulls, and songbirds (Wilcox 1959, Matteson 1980). First (unsustained) flight has been observed at around 18 days, with chicks molting into first juvenile plumage by day 22.

Nest success depends heavily upon camouflage (Hull 1981). Hatching success ranges widely as follows: 91 percent for undisturbed beaches on Long Island (Wilcox 1959), 76 percent for undisturbed beaches in Nova Scotia (Cairns 1977), 44 percent on relatively undisturbed beaches at Lake of the Woods (Cuthbert and Wiens 1982), and 30 percent maximum at disturbed Michigan beaches (Lambert and Ratcliff 1979).

Plover diet consists of worms, fly larvae, beetles, crustaceans, mollusks, and other invertebrates (Bent 1929). In New Jersey, intertidal polychaetes were the main prey of plovers (Staine and Burger 1994). Plover forage along ocean beaches, on intertidal flats and tidal pool edges. Studies by Cuthbert and Weins (1982) indicate that open shoreline areas are preferred and vegetated beaches are avoided. Plover obtain their food from the surface of the substrate, or occasionally will probe into the sand or mud.
In Massachusetts, plover preferred mudflat, intertidal and wrack habitats for foraging (Hoopes et al. 1992a). On Assateague Island, bay beaches and island interiors were much more favorable as brood-rearing habitats than were ocean beaches (Patterson et al. 1992).

Habitat use before breeding

A growing body of evidence reinforces information presented in the 1996 revised recovery plan regarding the importance of wide, flat, sparsely-vegetated barrier beach habitats for recovery of Atlantic Coast piping plovers. Such habitats include abundant moist sediments associated with blowouts, washover areas, spits, unstabilized and recently closed inlets, ephemeral pools, and sparsely vegetated dunes.

Many Piping Plovers arrive in breeding areas well before the time of most active courtship. During this period, Piping Plovers use bay intertidal zones preferentially (Loegering 1992, Cohen, Houghton, and Keane, unpublished data). This use is tide dependent. During pre-breeding surveys conducted at low tide on Assateague Island, Loegering (1992) observed 9 times as many plovers on bay tidal flats as he did in the ocean intertidal zone. At high tide, however, when the bay intertidal flats were submerged, the number of Piping Plovers on the bay side of barrier islands was similar to the number on the ocean side. On South Monomoy Island, Massachusetts, foraging in sound and tidal pool intertidal zones was not spread uniformly across falling and rising tides. Rather use was most concentrated on the lowest stage of the tide (Keane, unpublished data). This may be because benthic organisms are more abundant in the lower part of the intertidal zone where their habitat is covered by water much of the day (Bertness 1999).

Habitat use during breeding

Nest Site Selection – Piping Plovers often select nest sites near moist substrate habitats. Patterson (1991) noted that most plover nesting on Assateague Island, Maryland and Virginia, occurred on beaches adjacent to one of the several types of moist substrate habitats available there. Elias et al. (2000) reported the pattern of nesting on three New York barrier islands. All 1-km beach segments that were adjacent to either beach pools or bay intertidal zone were used for nesting, whereas fewer than half of the beach segments without these habitats were used by nesting Piping Plovers. Beach segments adjacent to these habitats supported 48 % of nesting pairs in that study, despite comprising only 1% of the habitat.

Piping Plovers colonized the Village of West Hampton Dunes, New York, after the island breached and large tidal flats were deposited. Similarly, the plover population on Assateague Island National Seashore increased dramatically after storms overwashed the island, increasing access to bay intertidal habitats (Kumer, unpublished data). On South Monomoy Island, more than 75% of plovers nested <400 m from large sound intertidal flats or a large intertidal pool (Keane, unpublished data).

Cohen et al. (2008) reported that mean vegetative cover around piping plover nests on a recently re-nourished Long Island beach was 7.5%, and all plovers nested in <47% cover. Although almost 60% of nests were on bare ground, nests occurred in sparse vegetation more often than expected based on availability of this habitat type. Plovers also appeared to favor nest sites with coarse substrate over pure sand. At the same study area, piping plover chicks foraged more than expected and exhibited high peck rates in wrack, where arthropod abundance indices were also high (Cohen et al. 2009). Following storm-and human-related increases in nesting and foraging habitat, the population at West Hampton Dunes, New York, grew from five pairs in 1993 to 39 pairs in 2000, and then declined to 18 pairs by 2004 concurrent with habitat losses to human development and vegetation growth (Cohen et al. 2009).

Distribution of nests was heavily concentrated on the bayside of the barrier island in the early years following inlet formation and closure, but bayside nests decreased precipitously starting in 2001 and disappeared by 2004 as the study area was redeveloped and the bayside revegetated. The chick foraging rate was highest in bayside intertidal flats and in ocean and bayside fresh wrack. Chicks used the bayside more than expected based on percentage of available habitat, and survived better on the bayside before village construction and the initiation of predator trapping, but not after. In most years, density of nesting pairs adjacent to bayside overwash was 1.5 to two times that at an adjacent reference site, where beach nourishment increased nesting habitat but not foraging habitat. Cohen et al. (2009) concluded that local population growth can be very rapid where storms create both nesting and foraging habitat in close juxtaposition. An increase in local nesting habitat via artificial beach nourishment, however, is not necessarily followed by an increase in the local population if nearby intertidal flats are absent. Cohen

et al. (2009) also note similarity between their results and observations by Wilcox (1959) of rapid colonization of habitats created on Westhampton barrier beaches by storms in the 1930s and their subsequent decline following revegetation and redevelopment (see the 1996 recovery plan)

Brood Habitat Selection- In New York, when broods had access to beach pools, they spent more than 70% of their time in pool habitat. Compositional analysis, a technique for ranking habitats (Aebischer et al. 1993), showed that pool habitat ranked first in these areas (Elias et al. 2000). In the same study, broods with access to bay tidal flats spent 57% of their time in those habitats, which ranked first among habitats for that set of broods.

Habitat Use By Adults During Breeding - Preliminary information from color marked birds in West Hampton Dunes, New York (Cohen, et al. 2008), indicates that breeding adult plovers travel substantial distances to forage on tidal flats in Moriches Bay during incubation and brood rearing. Travel distances approaching 1 km have been recorded.

Habitat Use after Breeding

Habitat use immediately following breeding has received little formal study. However, we have observed fledgling Piping Plovers using the intertidal flats at West Hampton Dunes, New York, at the end of the breeding season. When chicks are first capable of flying, they only weigh about 70% of adult weight (Cohen, et al. 2008). Foraging on the intertidal flats, which are rich in polychaetes, mollusks and arthropods (Loegering 1992, Loegering and Fraser 1995, Bertness 1999, Elias et al. 2000) may allow fledglings to put on fat required for successful migration to wintering areas.

Winter

On the Alabama coast, Piping Plovers used mudflats or sandflats 93% of the time observed (Johnson and Baldassare 1988). As before breeding, this use is tide-dependent. Johnson and Baldassarre (1988) reported a negative correlation between tide height and foraging activity. Nicholls and Baldassare (1990) Surveyed 1422 km of shoreline from Virginia to Key West, and 1283 km from Everglades National Park to Brownsville, Texas. Using discriminant analysis, they found that percent of habitat classified as mudflat, sand flat and tide pool helped distinguish used from unused habitats on the Atlantic coast, and percent mudflat helped discriminate used from unused areas on the gulf coast. They noted "Piping Plovers were observed foraging most frequently on sandflats and sandy mudflats." Likewise, Zonick (2000) found that during the winter on the Texas Gulf Coast barrier islands, plover densities were greater in bay side feeding areas than on Gulf side areas. Drake et al. (2001) used radio telemetry and estimated use of algal flats, lower sandflats and mudflats to comprise 74%, 89% and 78 % of habitat use in Fall, Winter and Spring, respectively.

Population Dynamics

Recovery criteria established in the Piping Plover Recovery Plan set population and productivity goals for each Recovery Unit, as well as for the entire population. The population goals for the Atlantic Canada, New England, NY-NJ, and Southern Recovery Units are 400, 625, 575, and 400 pairs, respectively. The productivity goal for each of the recovery units is to achieve a five-year average productivity of 1.5 chicks fledged per pair. Attainment of these goals for each recovery unit is an integral part of the recovery strategy that seeks to reduce the probability of extinction for the entire population by:

- contributing to the population total;
- reducing vulnerability to environmental variation, including effects of hurricanes, oil spills, or disease;
- increasing the likelihood of genetic interchange among recovery units; and
- promoting re-colonization of any sites that experience declines or local extirpations due to low productivity or temporary habitat succession.

The Piping Plover Recovery Plan identifies a recovery objective to ensure the long-term viability of the Atlantic Coast plover population in the wild, thereby allowing for the de-listing of this species, along with five criteria for meeting the objective, which are listed below:

- The population goal of 2,000 breeding pairs, distributed among four recovery units, and maintained at that level for five years;
- The adequacy of a 2,000-pair population of Piping Plovers has been verified to maintain heterozygosity and allelic diversity over the long-term;
- A five-year average productivity of 1.5 chicks fledged per pair has been achieved in each of the recovery units;
- Long-term agreements have been instituted to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit; and
- Long-term maintenance of wintering habitat, sufficient in quantity, quality, and distribution has been ensured to maintain survival rates for a 2,000-pair population.

The Piping Plover Recovery Plan further states, "A premise of this plan is that the overall security of the Atlantic Coast Piping Plover population is profoundly dependent upon attainment and maintenance of the minimum population levels for the four recovery units. Any appreciable reduction in the likelihood of survival of a recovery unit will also reduce the probability of persistence of the entire population." Under Section 7 (a)(2) of the ESA, Federal agencies shall consult with the Service or NMFS to ensure that any activities that they fund, authorize, or carry out do not jeopardize the continued existence of a Federally-listed species. Recovery of the Atlantic Coast Piping Plover population is occurring in the context of an extremely intensive protection effort, since pressures on Atlantic Coast beach habitat from development and human disturbance is continually increasing. Loss and degradation of habitat due to development and shoreline stabilization have been major contributors to the species' decline. Disturbance by humans and pets often reduces the functional suitability of habitat and causes direct and indirect mortality of eggs and chicks. Predation has also been identified as a major factor limiting Piping Plover reproductive success at many Atlantic Coast sites and substantial evidence shows that human activities are affecting types, numbers, and activity patterns of predators, thereby exacerbating natural predation (U.S. Fish and Wildlife Service 1996a).

Range-wide Status and Distribution of the Atlantic Coast and NY-NJ Recovery Unit Populations

The Atlantic Coast population breeds on sandy beaches along the east coast of North America, from Newfoundland to South Carolina. The 2012 Atlantic Coast piping plover population preliminary estimate was 1,762 pairs, more than double the 1986 estimate of 790 pairs. Discounting apparent increases in New York, New Jersey, and North Carolina between 1986 and 1989, which likely were due in part to increased census effort (USFWS1996), the population posted a net increase of 86% between 1989 and 2011. The largest net population increase between 1989 and 2011 has occurred in New England (266%), followed by New York-New Jersey (56%). In the Southern Recovery Unit, net growth between 1989 and 2011 was 54%, but almost all of this increase occurred in two years, 2003-2005. Most recently, the total Atlantic Coast population estimate attained 1,890 pairs in 2007 before declining 6% to 1,762 pairs in 2012. Decreases during this period occurred in all Recovery Units except New England, where the population grew 7% between 2007 and 2010. Abundance in both the Eastern Canada and New York-New Jersey Recovery Units declined 15%, while the Southern Recovery Unit population experienced an 8% net decrease. The 64% decline in the Maine population between 2002 and 2008, from 66 pairs to 24 pairs, followed only a few years of decreased productivity and provides another example of the continuing risk of rapid and precipitous reversals in population growth. Thus, optimism about progress towards recovery should be tempered by observed geographic and temporal variability in population growth (USFWS 2012)

Piping Plover Habitat Utilization History along the Long Island Coast

Overwash habitats, bayside flats, unstabilized and recently closed inlets, ephemeral pools (areas on the beach where sea and/or rain water pool during storm overwashes and rains), and moist, sparsely vegetated barrier flats are especially important to Piping Plover productivity and carrying capacity in the New England, NY-NJ, and Southern Recovery Units (*e.g.*, Wilcox 1959; Strauss 1990; Massachusetts Division of Fisheries and Wildlife 1996; Jones 1997; Houghton *et al*. 2000; Cohen *et al.* 2003). In New York, Wilcox (1959) described the effects on Piping Plovers from storms in 1931 and 1938 that breached the Long Island barrier islands, forming Moriches and Shinnecock Inlets and leveling dunes across the south shore.

Only three to four pairs of Piping Plovers nested on 17 mi. (27.4 km.) of barrier beach along Moriches and Shinnecock Bays in 1929. Following the natural opening of Moriches Inlet in 1931, plover abundance increased to 20 pairs in 2 mi. (3.2 km.) of beach habitat by 1938. In 1938, a hurricane opened Shinnecock Inlet and also eroded dunes along both Shinnecock and Moriches Bays. In 1941, plover abundance along the same 17 mi. (27.4 km.) of beach peaked at 64 pairs. Abundance then gradually decreased, a decline that Wilcox (1959) attributed to loss of habitat due to beach nourishment to rebuild dunes, the planting of beach grass, and the construction of roads and summer homes.

Elias *et al.* (2000), in a study of nest site selection on 55.8 mi. (90 km.) of beach, stretching from Jones Beach Island to Westhampton Barrier Island, New York, found that Piping Plover use of ephemeral pools and bay tidal flats was greater than expected based on habitat availability. Arthropod abundances (a prey base for Piping Plovers), plover foraging rates, and brood survival were highest in these habitats. Ephemeral pools and tidal flats produced 51 of 81 surviving broods (63 percent), although they accounted for only 12 percent of the habitat surveyed. The authors observed that these "superior habitats" were rare in their study area and that this may be due, in part, to beach development and management practices, including attempts to stabilize beaches by means of jetty construction, breach filling, and beach renourishment. They concluded that the retention of adequate high quality habitats is important to raising Piping Plover productivity rates to levels that will allow the species' recovery.

Fire Island has a history of sporadic overwashes and formation and closures of inlets (Leatherman and Allen 1985) which have renewed habitats important to Piping Plovers (Elias-Gerken 1994). Compared to the baseline for the last several hundred years, the frequency of overwashes and breaches on Fire Island has decreased since the 1938 hurricane, apparently due to anthropogenic barrier island stabilization (Elias-Gerken 1994). However, overwash habitat formed in Old Inlet in the early to mid 1990s and early 2000s. Fire Island would probably be covered with more overwashes, more open vegetation, and perhaps more inlets if humans had not begun to counter natural geologic processes and storm-related changes to barrier island morphology following the 1938

hurricane (Leatherman and Allen 1985). On Fire Island, where ephemeral pools, bayside overwash fans, and sandspits were absent and where broods had access only to oceanic foraging habitats, Elias-Gerken (1994) found that the majority of Piping Plovers tended to cluster near the barrier island tips at Moriches Inlet (Smith Point County Park and Cupsogue County Park) and Democrat Point (Robert Moses State Park).

Predation of Piping Plovers

Predators of piping plover eggs and chicks within the New York-New Jersey Recovery Unit include, but are not limited to, red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), herring gull (*Larus argentatus*), great black-backed gull (*Larus marinus*), and crow (*Corvus brachyrhyncos*), as well as feral and domestic cats. Beach stabilization may be exacerbating natural predation on Piping Plover adults, eggs, and chicks by promoting human use which introduces pets and other natural predators of the Piping Plover (U.S. Fish and Wildlife Service 1996a). For example, unleashed domestic dogs destroyed at least two nests within the Corps' Westhampton Interim Project Area, a nourished beach, in 2003 (Cohen, Virginia Tech, pers. comm., 2003).

Raithel (1984) reported that the availability of trash at beach homes led to an increase in local populations of raccoons. Wilcox (1959) observed 92 percent hatching success of nests between 1939 and 1958 in Long Island, New York (a period of less beach development and stabilization), with loss of only two percent of nests to crows. Elias-Gerken (1994) observed crows perching and nesting in Japanese black pines (*Pinus thunbergii*) that were planted to stabilize the beaches and provide wind breaks on Jones Island, New York, and hypothesized that this vegetation and other perches, such as electric light poles, exacerbated depredation by crows on Piping Plovers, as the author reported the loss of 21 percent of nests in her study area to crows in 1992 and 1993. Gulls and crows are also major predators at other vital Long Island nesting areas (Kiesel, pers. comm., 2000; Davis, *unpublished report*, 2002). Avian predators such as crows and blackbirds (Icteridae sp.) were a significant source of predation during the 2003 breeding season at the Corps' Westhampton Interim Project Area, Westhampton, New York (Cohen, Virginia Tech, pers. comm., 2003).

A variety of techniques are employed to reduce nest predation. Predator exclosures have reduced predation on Piping Plover eggs and increased hatching success at many nesting sites on the Atlantic Coast (Rimmer and Deblinger 1990; Melvin *et al.* 1992; Canale, New Jersey Department of Environmental Protection, *in litt*., 1997). The use of predator exclosures has been associated with increased mortality due to entanglements of adult birds in the exclosure netting, attraction of predators, and vandalism. Vandalism of exclosures (and symbolic fencing) may influence a land managers' decision to deploy exclosures (Davis, *unpublished report*, 2002). Exclosures may also be an attractant to predators. In 1995, foxes keyed in on exclosures causing high rates of Piping Plover nest abandonment and low productivity in 1995 (Houghton *et al.* 1997).

Seabeach Amaranth

Listing

On April 7, 1993, seabeach amaranth was added to the List of Endangered and Threatened Wildlife and Plants as a threatened species. The listing was based upon the elimination of seabeach amaranth from two-thirds of its historic range, and continuing threats to the 55 populations that remained at the time (U.S. Fish and Wildlife Service 1993). No critical habitat, as defined under the ESA, has been designated for this species.

Life History

Seabeach amaranth (family *Amaranthaceae*) is an annual plant native to the barrier island beaches of the Atlantic Coast from Massachusetts to South Carolina. The original range of this species extended from Cape Cod, Massachusetts, to central South Carolina, a stretch of coast approximately 994 mi. (1,600 km.). The range of seabeach amaranth is characterized by islands developed by highwave energy, low tidal energy, frequent overwash, and frequent breaching by hurricanes with resulting formation of new inlets (Weakley and Bucher 1992). Within its range, the species' primary habitat consists of overwash flats at accreting ends of barrier islands, and lower foredunes and upper strands of non-eroding beaches. Seabeach amaranth is never found on beaches where the foredune is scarped by undermining water at high storm tides (Weakley and Bucher 1992).

Occasionally, small, temporary, and casual populations are established in secondary habitats such as blowouts in foredunes, and sand or shell dredge spoil or beach nourishment material (Weakley and Bucher 1992). Upon germination, the plant initially forms a small, unbranched sprig. Soon after, it begins to branch profusely into a low-growing mat.

Seabeach amaranth's fleshy stems are prostrate at the base, erect or somewhat reclining at the tips, and pink, red, or reddish in color. The leaves of seabeach amaranth are small, rounded, and fleshy, spinach-green in color, with a characteristic notch at the rounded tip. Leaves are approximately 1.3 to 2.5 cm. in diameter and clustered towards the tip of the stem (Weakley and Bucher 1992). Plants often grow to 30 cm. in diameter, consisting of 5 to 20 branches, but occasionally reach 90 cm. in diameter, with 100 or more branches. Flowers and fruits are inconspicuous, borne in clusters along the stems. Seeds are 2.5 mm. in diameter, dark reddish-brown, and glossy, borne in low-density, fleshy, iridescent utricles (bladder-like seed capsules or fruits), 4 to 6 mm. long (Weakley and Bucher 1992). The seed does not completely fill the utricle, leaving an air-filled space (U.S. Fish and Wildlife Service 1996b). Many utricles remain attached to the parent plant and are never dispersed, leading to *in situ* planting. This phenomenon has also been observed in sea rocket (*Cakile edentula*) and may be an adaptation to dynamic beach conditions. If conditions remain favorable at the site of the parent plant, then seed source for retention

of that site is guaranteed. When habitat conditions become unsuitable, other seeds have been dispersed to colonize new sites (Weakley and Bucher 1992). Individual plants live only one season with only a single opportunity to produce seed. The species overwinters entirely as seeds.

Germination of seedlings begins in April and continues at least through July. In the northern part of the range, germination occurs slightly later, typically late June through early August. Reproductive maturity is determined by size rather than age and flowering begins as soon as plants have reached sufficient size. Even very small plants can flower under certain conditions. Flowering sometimes begins as early as June in the Carolinas but more typically commences in July and continues until the death of the plant. Seed production begins in July or August and reaches a peak in most years in September. Seed production likewise continues until the plant dies. Senescence and death occur in late fall or early winter (U.S. Fish and Wildlife Service 1996b). While seabeach amaranth seems capable of essentially indeterminate growth (Weakley and Bucher 1992), predation and weather events, including rainfall, hurricanes, and temperature extremes, have significant effects on the length of the species' reproductive season. As a result of one or more of these influences, the flowering and fruiting period can be terminated as early as June or July (U.S. Fish and Wildlife Service 1993).

Seabeach amaranth does not occur on well-vegetated beaches, particularly where perennials have become strongly established (Weakley and Bucher 1992). Pauley *et al*. (1999) documented a negative correlation between seabeach amaranth and several dominant foredune species. A particularly strong negative association has been reported between seabeach amaranth and beach grasses (*Ammophila* sp.) (U.S. Fish and Wildlife Service 1996b). A positive correlation has been observed between seabeach amaranth and sea rocket, an annual plant (Hancock 1995). Historic records of seabeach amaranth are known from nine states. Largely due to human activities such as trampling during recreation and beach stabilization, the species was eliminated from seven of these states in the 1980s, remaining only in the North and South Carolinas. Seabeach amaranth is still considered extirpated from Massachusetts and Rhode Island. Since 1990, the species has reoccupied five states from which it had previously been extirpated. The current known range of naturally occurring seabeach amaranth is Water Mill Beach on Long Island, New York, to Debidue Beach, South Carolina (Young 2003; Hamilton 2000a).

The plant is eliminated from existing habitats by competition and erosion and colonizes newly-formed habitats by dispersal and (probably) long-lived seed banks. A poor competitor, seabeach amaranth is eliminated from sites where perennials have become established, probably because of root competition for scarce water and nutrient supplies (Weakley and Bucher 1992). The same physical forces (*e.g*., storms and extreme high tides) that create the plant's very specific and ephemeral coastal habitat also destroy it. Existing habitats are eroded away but new habitats are created by island overwash and breaching. Therefore, seabeach amaranth requires extensive areas of barrier island beaches and inlets, functioning in a relatively natural and dynamic manner. Such

conditions allow the plant to move around in the landscape, occupying suitable habitats as they are formed (U.S. Fish and Wildlife Service 1996b). Seeds are dispersed by a variety of mechanisms involving transport via wind and water. Seeds retained in utricles are easily blown about, deposited in depressions, the lee behind plants, or in the surf. Naked seeds are also commonly encountered in the field and are also dispersed by wind, but to a much lesser degree than seeds retained in utricles. Naked seeds tend to remain in the lee of the parent plant or get moved to nearby depressions (Weakley and Bucher 1992). Observations from South Carolina indicate that seabeach amaranth seeds are also dispersed by birds through ingestion and eventually deposited with their droppings (Hamilton 2000b).

Population Dynamics

Density of seabeach amaranth is extremely variable within and between populations. The species generally occurs in a sparse to very sparse distribution pattern, even in the most suitable habitats. A typical density is 100 plants per linear km. of beach, though occasionally on accreting beaches, dense populations of 1,000 plants per linear km. of beach can be found. Island-end sand flats generally have higher densities than oceanfront beaches (Weakley and Bucher 1992). Seabeach amaranth has been found to have a strongly clumped distribution (Hancock 1995). On Long Island, New York, however, dense assemblages and high abundances have been recorded on central barrier island locations (Young 2002). Within its primary habitats, seabeach amaranth concentrations can be found in the wrackline (Mangels 1991; Weakley and Bucher 1992; Hancock 1995; MacAvoy 2000). In 2001, a study by Pauley *et al.* (1999) suggested that organic litter may be an advantageous microhabitat for seabeach amaranth when it contains higher levels of organic material and moisture than bare sand.

Range-wide Status and Distribution

Because of the species vulnerability to threats and the fact that it has already been eliminated from two-thirds of its range, the species was Federally-listed as threatened by the Service in 1993. Weakley and Bucher (1992) completed range-wide surveys of seabeach amaranth at known historical sites in 1987 and 1988. In 1987, 39 populations contained a total of 11,740 plants. In 1988, 45 populations contained a total of 43,651 plants, representing a one-year increase of 372 percent. A survey in 1990 revealed 43 populations with a total of 11,075 plants in the Carolinas plus an additional 13 populations with 357 plants which reappeared on Long Island, New York (Clements and Mangels 1990). Even with the addition of the New York populations, the 1990 survey documented a range-wide reduction of 74 percent from the 1988 census. Due to the limited number of surveys, consecutive data over the last three years (2000-2002) was only available for the states of Delaware, New Jersey, and New York. In New York State, the New York State Natural Heritage Program (NYSNHP) has collected data over those years. The 2000 population of seabeach amaranth had an uneven geographic distribution, with almost 99 percent of the plants located on Long Island, New York. A single site on

Long Beach Island, New York, comprised 75 percent of the total plants range-wide. Of the 39 extant sites documented in 2000, eleven had 100 or more plants (seven in New York, two in New Jersey, and two in North Carolina), and four had 1,000 or more plants (all in New York). Seventeen sites had fewer than ten plants (three in New York, one in Maryland, eleven in North Carolina, and two in South Carolina) (Young 2003; MacAvoy 2000; National Park Service 2001a and 2001b; Jolls and Sellers 2000; U.S. Army Corps of Engineers 2001b; Hamilton 2000a). Historically, seabeach amaranth occurred in nine states from Massachusetts to South Carolina.

The populations which have been extirpated are believed to have succumbed as a result of hard shoreline stabilization structures, erosion, tidal inundation, and possibly as a result of herbivory by webworms (U.S. Fish and Wildlife Service 1994). The continued existence of the plant is threatened by these activities (Elias-Gerken 1994; Van Schoik and Antenen 1993) as well as the adverse alteration of essential habitat primarily as a result of "soft" shoreline stabilization (beach nourishment, artificial dune creation, and beach grass plantings), but also from beach grooming and other causes (Murdock 1993). Populations of seabeach amaranth at any given site are extremely variable (Weakley and Bucher 1992) and can fluctuate by several orders of magnitude from year to year. The primary reasons for the natural variability of seabeach amaranth are the dynamic nature of its habitat and the significant effects of stochastic factors such as weather and storms on mortality and reproductive rates. Although wide fluctuations in species populations tend to increase the risk of extinction, variable population sizes are a natural condition for seabeach amaranth and the species is well adapted to its ecological niche.

Recreational and Off Road Vehicle (ORV) Impacts to Seabeach Amaranth

Intensive recreational use and ORV traffic on beaches can threaten seabeach amaranth populations, both through direct damage and mortality of plants and by impacting their habitats. Light pedestrian traffic, even during the growing season, usually has little effect on seabeach amaranth (U.S. Fish and Wildlife Service 1993). Problems generally arise only on narrow beaches or beaches which receive heavy recreational use. In such areas, seabeach amaranth populations are sometimes eliminated or reduced by repeated trampling. Off-road vehicle use on the beach during the growing season can have detrimental effects on the species, as the fleshy stems of this plant are brittle and easily broken. Plants generally do not survive even a single pass by a truck tire (Weakley and Bucher 1992). In some cases, winter ORV traffic may actually provide some benefits for the species by setting back succession of perennial grasses and shrubs with which seabeach amaranth cannot successfully compete. But, extremely heavy ORV use, even in winter, may have some negative impacts, including pulverization of seeds (Weakley and Bucher 1992).

Herbivory

Predation by webworms (caterpillars of small moths) is a major source of mortality and lowered fecundity in the Carolinas, often defoliating plants by early fall (U.S. Fish and Wildlife Service 1993). Defoliation at this season appears to result in premature senescence and mortality, reducing seed production, the most basic and critical parameter in the life cycle of an annual plant. Webworm predation may decrease seed production by more than 50 percent (Weakley and Bucher 1992). In New York, herbivory by saltmarsh caterpillars (*Estigmene acraea*) has been observed (U.S. Fish and Wildlife Service 1996b). Webworm herbivory of seabeach amaranth has not been documented in Delaware or Maryland. Overall, webworm herbivory is probably a contributing, rather than a leading factor, in the decline of seabeach amaranth. In combination with extensive habitat alteration, severe herbivory could threaten the existence of the species (Weakley and Bucher 1992).

New Threats

New threats (mammalian and avian herbivores and disease) to seabeach amaranth have been documented since the species was listed in 1993. These factors are lesser threats than habitat modification, but may increase the risk of extinction by compounding the effects of other, more severe threats. Several additional herbivores of seabeach amaranth have been observed including white-tailed deer (*Odocoileus virginianus*), rabbits (*Sylvilagus floridanus*), and migratory songbirds (Van Schoik and Antenen 1993). The first known disease of seabeach amaranth was documented in South Carolina in 2000. During the 2000 growing season, an oomycete (*Albugo* sp.) was observed on seabeach amaranth in several South Carolina sites (Strand and Hamilton 2000). This pathogen is a white rust or water mold. Effects on infected individuals were significant, resulting in death of the plants two to four weeks after lesions were first observed. Anecdotal observations suggest that isolated plants tended to avoid infection (Strand and Hamilton 2000).

5. Direct Impacts to Affected Species

The definition of "Take" of listed beach species (i.e. piping plover and seabeach amaranth) from construction and other beach activities includes harm or harassment to individuals from construction or other project related activities such as disturbance to animals and their habitat. For the plant species, this includes amaranth mortality and burial of its seed bank due to fill placement. Seabeach amaranth and piping plover could be directly impacted under this alternative, as sand would be placed on sections of beach involving manipulation of the beach area by construction equipment. However, historical and current distribution of these species has not been in the community areas where part of the project is proposed. There are six recorded locations of seabeach amaranth on Fire Island. Historically the largest concentrations of the plant have been recorded at Democrat Point and within Smith Point County Park. Most of the piping plover and nest

occurrences have been recorded in the Wilderness Area and the Sunken Forest/Sailors Haven area, however birds and nests have been located in or around communities in front but mainly flanking the communities' boarders to the east or west. In the areas of know piping plover nesting the project would be constructed outside of the April 1 – September 1 window. A requirement of beach nourishment is to conduct surveys for both species (per USFWS Conservation Measures protocol) prior to and during such activities so that species status is accurately determined. If piping plovers are present, then no placement area activities are to be conducted. If seabeach amaranth is present, then protective fencing (per USFWS conservation measure protocol) will be used as a protective buffer and monitored until natural annual mortality occurs. In the unlikely event of seabeach amaranth presence and construction activities unable to avoid plants physically or time of year, plants could be transplanted to similar nearby project site habitat and protected through fencing and educational signs and monitored. Burial of seed bank with sand placement on the beach is also a potential adverse impact. An additional measure to minimize and compensate for any amaranth direct take, seeds would be collected and germinated and replanted in the project site and protected through natural senescence (per USFWS protocol, USFWS 2002).

Therefore, direct impacts on listed species are not anticipated for two reasons. First, listed species are not expected to occur in the community areas since existing beach profiles and human disturbance conditions are for the most part unsuitable for those species. Secondly, the project activities will restrict activity to the time of year when species are not present to avoid and minimize direct impacts. Piping plovers are expected to leave the area by end of August and seabeach amaranth, although presence is unlikely, is expected to have peaked in seed production by September.

6. Potential Indirect Impacts to the Affected Species

Potential indirect impacts are anticipated to piping plovers and seabeach amaranth and their habitat. Beach nourishment could have both beneficial and adverse effects on these beach-dependent species. If the result of the sand placement produces a higher, wider beach and more available, suitable habitat for both seabeach amaranth and piping plovers, there can be potential positive habitat impacts. This could reduce flooding and potential loss of individuals and progeny (young and seed bank) and provide additional habitat for more colonization.

On the other hand, creating additional habitat in heavily disturbed community areas could result in sub-optimal or nonfunctional habitat, which could also result in a population sink. Wider, higher beaches could attract and result in higher recreational use and an increase in predation with additional habitat available for predators. Numerous studies have documented the direct and indirect adverse effects of human disturbance on piping plovers (Burger 1987, Melvin et. al. 1992, Howard et. al. 1993, Elias-Gerken and Fraser 1994, and Strauss 1990). Since the ocean beaches already receive high public use and have protected areas for rare flora and fauna, no shift or change in existing use is

expected. This is also the case with human induced predator impacts, as both beach conditions and predator populations fluctuate and cycle.

Further, construction activities would temporarily impact beach invertebrates and prey base of plovers as well as the potential habitat and seed bank of amaranth. Intertidal zone prey base would be affected, as project activities would place material below the high tide line. These impacts will be short term and minimal due to time of year placement and the amount of intertidal are along LI. Placement of sand on the dune could also bury rhizomes and affect the integrity of the plant community.

The construction of the beach and dune building could preclude natural overwash processes and early successional habitat formation in the short term. Nourishment would also bury or remove established beach vegetation and temporarily retard vegetative growth. It would provide a gently sloping beach and wider intertidal areas for increased plover breeding and foraging and invertebrate amaranth colonization. The project could also bury or temporarily remove the wrack line, an important source of prey for plovers.

Nourishment of the beach towards more stabilized conditions can preclude natural habitat formation, including overwash and back-bay foraging sites. The habitat resulting from the activities will be temporarily changed, as well as available prey base (potential removal of wrack/beach invertebrates). These conditions may be positive or negative, as more beach will be available as breeding habitat, but natural habitat formation of overwash areas could be precluded. These manipulated conditions are expected to be temporary and localized and quickly recover and recolonize with prey. Effects of this project are recognized to not last through the dynamic winters the shoreline will returned to its natural configuration within five years. The project will allow for overwash in all the other areas outside the project area along Fire Island.

The District has identified the following potential indirect adverse effects to listed species resulting from implementation of the project:

- Disturbance to prey base and temporarily reduced prey availability (destruction of beach invertebrates and wrack line);
- Reduction of potential for formation and maintenance of overwash or bayside piping plover breeding and foraging habitat;
- Disturbance to piping plovers through enhancing beaches to attract increased recreational activities on oceanside beaches;
- Increased potential predator populations/activity that could utilize habitat created by the project; and
- Changes in existing plover and amaranth habitats on FIIS (could be positive or

negative).

The District coordinated with the Department of Interior (NPS and USFWS), NYSDEC and Suffolk County and developed modifications to the proposed beach fill component of the TSP that would provide increased protection and improved productivity for listed species, including the piping plover. In addition, the District will conduct pre-construction field surveys for active piping plover nesting areas.

The proposed activities would cause short-term impacts to seabeach amaranth by directly covering the seeds or plants. However, as noted above, seabeach amaranth is limited to inhabit the Project area. In addition, similar to the recommendations provided by NYSDEC and USFWS for the piping plover, the District will implement several measures in an effort to minimize potential adverse impacts to existing seabeach amaranth populations (USACE 1998, USFWS 1999). These impact minimization measures include the following: pre and post-construction surveys of the Project area to determine the presence/absence of seabeach amaranth; education of residents, landowners, beach visitors, and beach managers; and the use of physical deterrents to deter human use of potential seabeach amaranth habitat. Because seabeach amaranth has not been identified as occurring in the majority of the Project area and because measures will be taken to minimize access to areas that are shown to have amaranth, No Effect determination was made on populations of seabeach amaranth related to the implementation of these actions.

Construction of the Project is likely to increase overall habitat suitability for seabeach amaranth along the affected beachfront. Although the planned beach berm is designed for an elevation of 9.5 ft NGVD, which is slightly higher than seabeach amaranth's preferred elevation, as the beach berm slopes toward the ocean, there will be a zone that falls within the plants preferred elevation range. Expanding the beach and particularly the zone most suitable for amaranth would likely provide habitat for seabeach amaranth. A summary of Project activities and their effects on populations of seabeach amaranth are presented in Table 6.

7. Duration of Effects

The District expects that effects of proposed action will provide storm damage protection for five years and then erode over the next five years to a point where it would not provide protection to the artificially created dune.

Table 5. Summary of Project Effects on Populations of Piping Plover.

Activities	Potentially Beneficial	Not Likely to Adversely Affect	Likely to Adversely Affect	No Effect
No-Action	X			
Project				
Staging Area Construction and Use		X		
Beach Fill/Dune Construction		X		
Cumulative				
Beach Fill/Dune as Coordinated with DOI	X	X		

Table 6. Summary of Project Effects on Populations of Seabeach Amaranth.

Activities	Potentially Beneficial	Not Likely to Adversely Affect	Likely to Adversely Affect	No Effect
No-Action	X			
Project				
Staging Area Construction and Use		X		
Beach fill/Dune Creation	X	X		
Cumulative				
Beach fill/Dune Creation	X	X		

8. Cumulative Effects

The proposed activities will provide long-term protection of potential habitat for the listed species in the upper beach and primary dune areas. To further reduce potential indirect impacts, the District will conduct pre and post construction field surveys for plovers and seabeach amaranth. Beach fill material would not be placed within 25 ft of the perimeter of population clusters or individual stems of seabeach amaranth. Outside of the communities work will be done from September through April 1 on any given year as well as many other conservation measures mention below.

Taking into consideration, the potential for indirect impacts could span from the Robert Moses State Park on the West to Smith Point County Park to the East. Additionally, the proposed FIMP project is undergoing study and proposed for implementation in the near future. This could result in additional beach nourishment efforts along Long Island after this is constructed.

Because of the limited extent of disturbance and distribution of these species identified as occurring in the Project area, implementation of the proposed action could not reasonably be considered as contributing to cumulative adverse impacts on these species. Therefore, because the proposed Project would serve to protect these species and their habitats, a Potentially Beneficial Impact determination was made on this proposed Project activity for this species.

9. Conservation Measures/Environmental Features

To minimize adverse impacts on the listed species, the District coordinated with the Department of Interior (NPS and USFWS), NYSDEC and Suffolk County and developed modifications to the proposed beach fill component of the TSP that would provide increased protection and improved productivity. The project modifications generally include dune relocation more landward and are:

1. Moving the dune alignment between Fields 2 and 3 in Robert Moses State Park is not necessary as there are currently no dunes planned for that location since the backshore elevation is already at a high elevation;

2. Revised dune tapers as discussed in Section 3 above;

3. At the Federal Lighthouse Tract approximately 3800 feet of dune will be built to a 1 on 10 slope (refer to Figure 3 above) (Consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) is required to finalize this modification). The tolerances for the berm height (set at 9.5 feet NGVD) will also be reduced from one to one-half foot to minimize heights immediately following construction;

4. In the area between Atlantique and Robins Rest approximately 900 feet of dune will be realigned north to the vegetation line west of Robins Rest to increase the amount of early successional overwash habitat preserved. The area east of Robins Rest currently has an access road to the beach and is heavily used and would thus be unsuitable for productive use by plovers. There would be a commitment to a monitoring and adaptive management plan that will maintain this habitat as early successional habitat for 10 years. The tolerances for the berm height will also be reduced from one to one-half foot to minimize berm height after construction; and

5. Within Smith Point County Park it is not feasible to eliminate the proposed dune system or vary its height without compromising coastal storm risk reduction or severely curtailing county park management, operations and use. Instead, at the three primary overwash areas in the park (in the areas of New Made Island, the recently closed Smith Point County Park breach, and Pattersquash Island), the dune would be created with a 1 on 10 slope to promote access from the bay side to the ocean side habitat suitable for plover nesting and rearing of chicks. In the all three areas the dune would not be vegetated, to more closely mimic conditions suitable to plovers. Similar commitments would be included in the plan to monitor and adaptively manage the additional habitat areas to maintain them as early successional habitat over 10 years. In addition, the plan will also include a commitment to monitor and adaptively manage the overwash habitats on the bay side of the three overwash areas should they begin to fill in with vegetation, or otherwise undergo succession to a habitat unsuitable to plovers (approximately 28 acres-New Made Island, and 36 acres at the recently closed Smith Point County Park breach, and Pattersquash Island). Finally there would be a commitment to restore up to approximately 39 acres of a now heavily vegetated area at Great Gun Beach to early successional habitat, and monitor and maintain that as previously described for the other areas.

The District believes the aforementioned modifications to the project will protect the available bayside, maintain habitats that might otherwise deteriorate over time, and will create new habitat from areas currently unsuitable. We believe that such modifications will, collectively, provide for more suitable habitat over time and potentially increase overall plover productivity of the area and advance the recovery of the species.

10. Conservation Measures

In addition to the Environmental Features (Project Modifications) discussed above, the District will also follow recommendations provided by the NYSDEC and USFWS previously (USACE 1998, USFWS 1999) and are described below. These measures are expected to minimize potential adverse indirect impacts on other species that may use coastal habitats in the project area, including several state-listed shorebird species.

As stated earlier, except within the boundaries of the Communities, construction activities will not occur during the piping plover breeding and nesting season. To minimize indirect impacts, the District will conduct surveys during the spring/summer, and prior to construction activities, to identify nesting plover in the Project area and to document all known locations of piping plover. In addition, the USACE will document any other Federal or state-listed wildlife species observed in the Project area during survey and will initiate consultation with appropriate state and Federal agencies.

The proposed project description includes a number of conservation measures that will be implemented for ten years. The intended purpose of these conservation measures is to

avoid or minimize adverse effects of the beach nourishment project to Federally-listed species.

A. Project Design Features

- Dune planting at low densities (18 in. on center) on the dune/upper beach interface, reducing the density of beachgrass plantings on the south face of the dune.

- Contacting the Service upon initiation and completion of construction activities. Pre-construction meetings with all project staff will be held to provide all information on resource protection and terms of the project permit.

- Providing all project personnel, construction staff, etc. with information regarding the conditions of the project (including all conservation measures).

- Time-of-Year Restrictions, which will provide for no activities between April 1 and September 1 to protect piping plovers and May 1 to October 15 to protect seabeach amaranth. If breeding piping plovers are not observed in a proposed project area, or are not within 1000 meters of the project area by July 15, then project activities may commence, following consultation with the agencies.

- Provisions for the project to only undertake low impact construction activities, such as beach surveying during the piping plover breeding season, utilizing a 300-ft protective buffer zone.

B. Surveying, Monitoring, and Adaptive Management

- Surveying and monitoring of the action area for threatened and endangered species during the spring and summer nesting seasons will be implemented for 10 years. The monitoring will be completed in coordination with the NPS, Suffolk County and the Service. Monitoring will include identification of suitable habitat, nesting areas, symbolic fencing, and signage.

    - Surveying and Monitoring will be undertaken by a qualified, designated biologist(s). Qualified biologists shall also work on the threatened and endangered species management activities (e.g., coordinating with local communities and agencies, as well as organizing the pre-season planning) in community beach nourishment project areas.

    - The qualified biologist will also recommend and implement changes in the location and configuration of symbolic fencing and warning signs and gauge the effectiveness of management actions. Biologists will be educated about the biology of listed species and required to attend a piping

plover management course organized by the Service, the NYSDEC, and The Nature Conservancy (TNC), prior to undertaking surveying, monitoring or management actions.

- Protection of breeding piping plovers on all suitable habitats in the action area from human disturbance (e.g., Off-road vehicles, hereafter ORVs, and recreational activities) and predation will be undertaken following the conditions outlined below. These conditions are also intended to offset impacts of habitat degradation and to assist in the recovery of the species.

- Suitable habitats within the project area(s) shall be protected through the placement of symbolic fencing and warning signs.

- Symbolic fencing is intended to avoid or minimize accidental crushing of nests and repeated flushing of incubating adults, as well as provide an area where chicks can rest and seek shelter when people are on the beach. Therefore, prior to the piping plover breeding or seabeach amaranth growing seasons, the applicant will coordinate with the land manager(s) and the Service biologists to design a "symbolic fencing plan."

- Coordination on the placement of symbolic fencing will incorporate field population and habitat data for the project area and visual assessment of all oceanside and bayside habitats each year. Habitats will be deemed suitable if piping plovers and seabeach amaranth were observed at the site in previous years or the beach width, slope, cover material (shell fragments), etc., are deemed adequate by the Service.

- Consistent with current FWS management measures, breeding and growing areas shall be protected with symbolic fencing using steel or Carsonite™ fiberglass posts placed approximately 33 ft apart and connected with string or twine. Fluorescent flagging material will be tied to the string every 1.6 ft to increase visibility and piping plover or seabeach amaranth habitat warning signs shall be placed on every second or third post. Posts stretch from the toe of the dune seaward to about 40 ft south of the toe of dune line. As sand accretes through the season, posts and fences may need to be moved seaward to maintain symbolic fencing at this distance.

- All pedestrian and ORV access into, or through, the breeding or growing areas shall be prohibited. Walkways may be permitted after an assessment by a qualified biologist and with the permission of the Service. Only persons engaged in monitoring, management, or research activities shall enter the protected areas. These areas shall remain symbolically fenced for piping plovers until at least July 15, and as long thereafter as viable eggs

or unfledged chicks are present. If no breeding piping plovers or their chicks are observed in the symbolically fenced areas, the fencing may be removed or reduced in scale provided that the seabeach amaranth is not present or the site is not suitable for seabeach amaranth. Symbolic fencing erected to protect seabeach amaranth shall be in place until the plant dies, or until October 15, whichever comes first

- Productivity and population surveys will be conducted each year. Population survey information shall include the total number of breeding pairs; the total number of piping plovers, paired and unpaired, within the action area; and detailed mapping of breeding (courtship, territorial, scrapes, egg-laying, incubating, and brood-rearing) and foraging use habitats in the action area. Productivity information shall include the total number of nests, the total number of fledged chicks per pair, and quantification of take, if observed, including eggs, chicks, and adults that occurred, including reasons for take and actions that were taken to avoid take.

- Surveys will be recorded and summarized, and plover locations will be recorded on maps, indicating areas surveyed and habitat types. Information collected will include the following:

    - date;
    - time begin/end;
    - weather conditions;
    - tidal stage;
    - area of coverage;
    - ownership of site;
    - number of adults observed;
    - number of pairs observed;
    - habitat type;
    - nearest known plover occurrence;
    - banded plovers; and
    - predator trail indices

- Prior to implementation of the monitoring program, the District will consult with, and obtain agreement from, the Service on the methodologies and reporting frequencies to be utilized. Surveys would be conducted three times weekly with observations evenly distributed over a minimum time period (to be determined). Survey time periods shall be conducted during daylight hours from 30 minutes after sunrise to 30 minutes before sunset and should include a wide range of tidal conditions and habitat types. Areas should be surveyed slowly and thoroughly and should not be conducted during poor weather (e.g., heavy winds greater than 25

miles-per-hour (mph), heavy rains, and severe cold), since birds may seek protected areas during these times.

- *Seabeach Amaranth Surveys*: If any beach nourishment activities are scheduled to occur during the growing season of seabeach amaranth (defined as May 15 to October 15), qualified, biologist hired by the applicant will survey the project area(s) for this species twice a month from June 1 to October 1, and also immediately prior to any construction or other work. Plant locations, numbers, and sizes will be recorded.

- *Fencing and Avoidance of Seabeach Amaranth*: If construction personnel or ORVs will be present in, or may pass through, seabeach amaranth growing areas, symbolic fencing will be erected encompassing a 10-ft protective buffer around the plants if practical. All construction activities will avoid all delineated locations of seabeach amaranth where feasible. The applicant will undertake all practicable measures to avoid any adverse impacts to plants.

- *Transplantation of Seabeach Amaranth Likely to be Destroyed*: In the event that seabeach amaranth is present in the action area, and it is likely that the plants will be destroyed, the applicant will transplant the individual plants to a similar habitat near, or within, the action area to lessen the impact. Transplantation will include removal of a sufficiently large and intact volume of sand to include the full extent of the roots. Transplanted individuals will be monitored until their deaths, and the monitoring results will be provided to the Service.

- *Seed Collection and Other Measures*: In consultation and cooperation with the Service, beginning in 2014, the applicant will develop and implement a plan to compensate for plant mortality and burial of the seed bank, involving collection of a portion of the seabeach amaranth seeds produced in all areas to be nourished or renourished where the plant is present. Seeds will be sent to a qualified greenhouse. A portion of the collected seeds will be stored under controlled conditions appropriate for the species (e.g., temperature, humidity, and light) and later redistributed within the action area.

  Qualified practitioners will attempt to germinate the remainder of the seeds. If successful, germinated plants will be replanted in suitable habitats within the action area, according to plans coordinated with the Service. If the number of wild plants bearing seeds is insufficient to collect an adequate amount of seeds, individual plants will be sent to a qualified greenhouse and propagated to produce additional seeds to be used for the purposes described above. Removal of a portion of the seed

bank through "scraping" and stockpiling the top layer of sand prior to renourishment may also be included in the plan to compensate for adverse effects to plants and to seeds. The stockpiled sand would be respread on the construction template upon completion of renourishments.

- Based upon the best available scientific data, the Service will determine an acceptable course of action to compensate for seed bank burial, including the amount of seeds to be collected; thresholds for collecting and propagating plants for production of additional seeds; the proportions of collected seeds to be stored versus germinated; protocols for collection, storage, germination, and reintroduction of plants and seeds into the project area; and procedures for scraping and re-spreading sand, if deemed appropriate. The applicant will monitor reintroduced plants and seeds for the duration of the growing season and report the results to the Service.

- These actions will be undertaken to offset the anticipated adverse impacts to the seed bank and individual plants whose destruction cannot be avoided. These actions will serve to compensate for any such loss but will not be construed as a long-term commitment to species propagation between renourishments. Such activities will not continue past the second year of placement cycle.

- *Evaluation of Seabeach Amaranth Conservation Measures:* In consultation and cooperation with the Service, the applicant will evaluate the success of measures to protect seabeach amaranth and will revise these protective measures as appropriate In the event that seabeach amaranth is present in the action area, and it is likely that the plants will be destroyed, the applicant will transplant the individual plants to a similar habitat near, or within, the action area to lessen the impact. Transplantation will include removal of a sufficiently large and intact volume of sand to include the full extent of the roots. Transplanted individuals will be monitored until their deaths, and the monitoring results will be provided to the Service.

- *Adaptive Management*

  - <u>Vegetation Management:</u> The District will coordinate with the Service in the preparation of a de-vegetation plan within the identified areas three primary overwash areas in the park (the areas of New Made Island, the recently closed Smith Point County Park breach, Pattersquash Island and Great Gun). The plan will be required for ten years.

- Predator Management: The District will coordinate with the Service in the preparation of a predator plan (mammalian) for pre-season and in-season predator monitoring program for all project areas. The predator monitoring plan will include measures needed to protect piping plovers, nests, and chicks. The plan will be required for ten years.

11. Access

The Service and their authorized representatives will be allowed unrestricted access to all project sites within the action area for the purposes of conducting research, monitoring, enforcement, looking for evidence of rare, threatened, or endangered wildlife or plants, preserving or protecting habitat, and erecting symbolic fencing or exclosure fencing for the purpose of protecting wildlife or plants. Access will be permitted from the landward toe of the dune to the water's edge.

12. Conclusions

It is the District's determination that implementing the proposed action in accordance with the standards and guidelines recommended by NYSDEC, NYSDOS, NPS and USFWS will not jeopardize the continued existence or contributes to the loss of viability of either of the Federally-listed endangered or threatened species listed identified by the USFWS. In addition, the proposed action would not significantly contribute to cumulative impacts associated with piping plover and seabeach amaranth. Therefore, the District requests USFWS concurrence for a may affect, but not likely to adversely affect and not likely to jeopardize the continued existence determination for the piping plover and seabeach amaranth.

As previously discussed, this proposed action would result in impacts to benthic communities (potential burial and habitat disturbances) and water quality (turbidity and dissolved oxygen) during active construction activities. However, these effects would be short-term, as the benthic communities will naturally begin to re-establish shortly after construction is completed, forming a similar community within a 6 months to 2 years (Peterson and Manning 2001). These impacts may result in a short-term reduction of forage material for piping plover in the immediate Project area. However, piping plover will utilize nearby undisturbed areas for feeding. In addition, because sediments in the Project area are sandy, any increased turbidity effects would generally be limited to the period of in-water construction, as this type of substrate tends to settle out of suspension quickly.

The Project would potentially result in direct and/or indirect disturbances to seabeach amaranth, piping plover and other nesting shorebirds/seabirds, including the Federally and state-listed least tern, roseate tern, and the state-listed common tern, if any are present in the Project vicinity during the time of construction. However, these impacts

can largely be avoided if the Conservation Measures highlighted above as well as the following Project Modifications are implemented:

- In Contract 1, the dunes will be realigned to meet up with existing dune line in the three overwash areas (New Made Island, the recently closed Smith Point County Park breach, and Pattersquash Island). The 13 foot dunes will go from a 1 on 5 slope to a 1 on 10 slope to maintain high quality nesting habitat and unrestricted travel corridors for the adult piping plovers and their chicks to reach feeding habitat on the ocean and bay shores.

- In Contract 1, an approximate 39 acre area on the east end of the project will be de-vegetated and the District will keep the vegetation at a 30-40% coverage in that area. The vegetation will be removed via mechanical, hand or chemically whichever the land manager and state regulations will allow in a particular area.

- In Contract 1, the dunes will not be planted in the three overwash areas in the areas of (New Made Island, the recently closed Smith Point County Park breach, and Pattersquash Island) to create optimal habitat.

- In Contract 1, the three overwash areas which contain the modified dune design (1 on 10 slope) will be maintained at a 30-40% vegetation coverage to create approximately 90 acres of optimal habitat. The vegetation will be removed via mechanical, hand or chemically whichever the land manager and state regulations will allow in a particular area.

- In Contracts 2 and 3, all taper into the Federal Tracts have been modified to minimize sand placement in these areas.

- In Contracts 2 and 3, all construction activities will initiate outside of the conservation window in the pre designated areas which have sustained piping plover and seabeach amaranth over the years (east and west of the Communities where applicable).

- In Contract 2, the dunes will be realigned to meet up with existing dune line at the Lighthouse tract. The 15 foot dune will go from a 1 on 5 slope to a 1 on 10 slope to allow plover chicks access to the bayside.

As the District has incorporated these into the Project Description, significant adverse impacts to these species are not expected.

Implementation of the proposed action would not contribute to the loss of viability of the piping plover or seabeach amaranth and no additional mitigation measures should be necessary. When compared to the No Action alternative, implementation of the proposed action would benefit piping plover and seabeach amaranth, as well as other shorebird/seabird species, through habitat improvement and an increase in the availability of suitable habitat.

Literature Cited

Aebischer, N. J., P. A. Robertson and R. E. Kenward. 1993. Compositional analysis of

Bent, A.C. 1929. Life histories of North American shorebirds (Part II). U.S. Natl. Mus. Bull. 146. Washington, D.C.habitat use from animal radio tracking data. Ecology 74:1313-1325.

Bertness, M. D. 1999. The ecology of Atlantic shorelines. Sinauer Associates, Inc. Sunderland, MA. 417pp.

Brotherton, D. K., J. L. Behler, and R. Cook. 2003. Fire Island National Seashore Amphibian and Reptile Inventory, March–September 2002. National Park Service and Wildlife Conservation Society Cooperative Agreement #1443CA4520-98-017. (In draft)

Burger, J. 1991. Foraging behavior and the effect of human disturbance on the Piping Plovers (*Charadrius melodus*). Journal of Coastal Research 7:39-52.

Canale. S. New Jersey Department of Environmental Protection. 1997.

Clemants, S., and C. Mangels. 1990. *Amaranthus pumilus* - New York State Status Survey. Report to U.S. Fish and Wildlife Service, Newton Corner, MA. 11 pp.

Cohen, J.B., J.D. Fraser, and D.H. Catlin. 2006. Survival and site fidelity of piping plovers on Long Island, New York. Journal of Field Ornithology 77:409-417.

Cohen, J.B., E.H. Wunker, and J.D. Fraser. 2008. Substrate and vegetation selection by nesting piping plovers (*Charadrius melodus*) in New York. Wilson Journal of Ornithology 120:404-407.

Cohen, J.B., L.M. Houghton, and J.D. Fraser. 2009. Nesting density and reproductive success of piping plovers in response to storm- and human-created habitat changes. Wildlife Monographs, No. 173.

Connor, P.F. 1971. The Mammals of Long Island, New York. New York State Museum and Science Service Bulletin 416. 78 pp.

Cross, R.R. 1990. Monitoring Management and Research of the Piping Plover at Chincoteague National Wildlife Refuge. Unpublished Report. Virginia Department of Game and Inland Fisheries, Richmond, VA. 68 pp.

Cross, R.R. and K. Terwilliger. 1993. Piping Plover flushing distances recorded in annual surveys in Virginia 1986-1991. Virginia Department of Game and Inland Fisheries, Richmond, Virginia. 5 pp

Davis, D. 2002. Monitor's Report: Arverne Piping Plover Site - 2002. Unpublished Report submitted to the U.S. Fish and Wildlife Service, Long Island Field Office, Islip, NY. XX pp.

Drake, K. E., J. E. Thompson and K. L. Drake. 2001. Movements, habitat use, and survival of nonbreeding Piping Plovers. Condor 103:259-267.

Elias, S. P., P. A. Buckley and J. D. Fraser. In Review. Piping Plover beach selection in New York.

Elias-Gerken, S.P., and J.D. Fraser. 1994. Piping Plover Foraging Ecology on Pikes Beach, Southampton, New York. Final Report submitted to the U.S. Fish and Wildlife Service, Sudbury, MA. 61 pp

Elias, S.P., J.D. Fraser, and P.A. Buckley. 2000. Piping Plover Brood Foraging Ecology on New York Barrier Islands. *Journal of Wildlife Management* 64(2) 9 pp.

Flemming, S.P., R.D. Chiasson, P.C. Smith, P.J. Austin-Smith, and R.P. Bancroft. 1988. Piping Plover status in Nova Scotia related to its reproductive and behavioral responses to human disturbance. Journal of Field Ornithology 59 (4): 31-330.

Flemming, S.P., R.D. Chiasson, and P.J. Austin-Smith. 1990. Piping Plover Nest-Site Selection in New Brunswick and Nova Scotia. Unpublished Document. Department of Biology, Queen's University, Kingston, Canada. 31 pp

Fraser, Jim. Moist Substrate Habitats For Piping Plovers on the Atlantic and Gulf of Mexico Coasts.

Goldin, M.R. 1990. Reproductive Ecology and Management of Piping Plover (*Charadrius melodus*) at Breezy Point, Gateway National Recreation Area, New York - 1990. Unpublished Report. Gateway National Recreation Area, Long Island, NY. 16 pp.

Goldin,M.R. 1993. Effects of Human Disturbance and Off-Road Vehicles on Piping Plover Reproductive Success and Behavior at Breezy Point, Gateway National Recreation Area, New York. M.S. Thesis, University of Massachusetts, Department of Forestry and Wildlife Management. 69

Goldin,M.R.1994. Breeding History, and Recommended Monitoring and Management Practices for Piping Plovers (*Charadrius melodus*) at Goosewing Beach, Little Compton, Rhode Island (with discussion of Briggs Beach). Report for the U.S. Fish and Wildlife Service, Hadley, MA. 36 pp.

Goldin, M.R. and J.V. Regosin. 1998. Chick Behavior, Habitat Use, and Reproductive Success of Piping Plovers at Goosewing Beach, Rhode Island. *Journal of Field Ornithology* 69(2):228-234.

Houghton, L. unpublished data. Graduate student, Virginia Tech, Blacksburg, VA.

Johnson, C. A. and G. A. Baldassarre. 1988. Aspects of the wintering ecology of Piping Plovers in coastal Alabama. Wilson Bull. 100:214-223.

Keane, S. K. unpublished data. Graduate student, Virginia Tech, Blacksburg, VA.

Loegering, J. P. 1992. Piping Plover breedng biology, foraging ecology and behavior on Assateague Island National Seashore, Maryland. M.S. thesis, Virginia Tech, Blacksburg, VA. 248pp.

Loegering, J. P.* and J. D. Fraser. 1995. Piping Plover survival in different brood-rearing habitats. J. Wildl. Manage. 59:646-655.

Nicholls, J. L. and G. A. Baldassarre. 1990. Habitat associations of Piping Plovers wintering in the United States. Wilson Bull. 102:581-590.

Patterson, M. E.,* J. D. FRASER, and J. W. Roggenbuck. Factors affecting Piping Plover productivity on Assateague Island. 1991. J. Wildl. Manage. 55:526-531.

Hamilton, R.D. III. 2000a. Cultured *Amaranthus* transplanted to the wild; *Amaranthus* seeds sown in 1999; South Carolina Seabeach Amaranth Populations. Unpublished data. Waddell Mariculture Center, Bluffton, South Carolina. 3 pp.

Hancock, T.E. 1995. Ecology of the threatened species seabeach amaranth (*Amaranthus pumilus*) Rafinesque). M.S. Thesis. University of North Carolina at Wilmington, Wilmington, North Carolina. 28 pp.

Hoopes, E.M. 1993. Relationship Between Human Recreation and Piping Plover Foraging Ecology, and Chick Survival. M.S. Thesis, University of Massachusetts, Amherst, MA. 106 pp.

Hoopes, E.M. 1994. Breeding ecology of Piping Plovers nesting at Cape Cod National Seashore - 1994. U.S. Department of the Interior, National Park Service, Cape Cod National Seashore, South Wellfleet, Massachusetts. 34 pp.

Hoopes, E.M., C.R. Griffin, and S.M. Melvin. 1992. Atlantic Coast Piping Plover Winter Distribution Survey. Unpublished Report submitted to the U.S. Fish and Wildlife Service, Sudbury, MA. 6 pp

Houghton, L.M., J.D. Fraser, and S.P. Elias-Gerkin. 1997. Effects of the Westhampton Interim Storm Damage Protection Project on Piping Plover Habitat at Pikes Beach, Village of West Hampton Dunes, New York - Interim Report for the 1996

Breeding Season. Virginia Polytechnic Institute and State University, Blacksburg, VA. 89 pp.

Jolls, C.L., and J.D. Sellars. 2000. Germination Ecology and Restoration of Seabeach Amaranth (*Amaranthus pumilus* Raf. Amaranthaceae). Final Report Contract No. C00432, Department of Agriculture and Consumer Services, Plant Conservation Program, State of North Carolina. Department of Biology, East Carolina University. Greenville, North Carolina. 29 pp. plus Appendices.

Jones, L.K. 1997. Piping Plover Habitat Selection, Home Range, and Reproductive Success at Cape Cod National Seashore, Massachusetts. M.S. Thesis, University of Massachusetts, Amherst, MA. 96 pp.

Kiesel, G. Citizens Environmental Research Institute. 2000.

Leatherman, S.P., and J.R. Allen, eds. 1985. Final Report: Fire Island Inlet to Montauk Point, Long Island, New York - Reformulation Study. Report prepared by the National Park Service, North Atlantic Region, Boston, MA to the U.S. Army Corps of Engineers, New York District, New York, NY. 351 pp.

MacAvoy, W.A. 2000. *Amaranthus pumilus* Raf. (seabeach amaranth, Amaranthaceae) Rediscovered in Sussex County, Delaware, Bartonia. In press.

Mangels, C. 1991. Seabeach amaranth in New York State. *New York Flora Association Newsletter* 2(2):7-8.

Massachusetts Division of Fisheries and Wildlife. 1996. Conservation Plan for Piping Plovers in Massachusetts submitted to U.S. Fish and Wildlife Service. Westborough, MA. 35 pp., plus appendices.

Melvin, S.M., E.M. Hoopes, and C.R. Griffin. 1992. Relationships Between Human Recreation and Piping Plover Foraging Ecology and Chick Survival. Massachusetts Division of Fisheries and Wildlife, Westboro, MA.

Murdock, N. 1993. Endangered and Threatened Wildlife and Plants: *Amaranthus pumilus* (Seabeach Amaranth) Determined to be Threatened. U.S. Department of the Interior, Fish and Wildlife Service, Federal Register, Vol. 58, No. 65: 18035-18042.

National Marine Fisheries Service (NMFS). 1993. Letter regarding rare species in the vicinity of Long Beach, NY, dated June 1993 from Richard B. Roe, Regional Director, National Marine Fisheries Service, Northeast Region to Bruce Bergmann, Chief of Planning Division, USACE, New York District.

National Marine Fisheries Service (NMFS). 2004. Essential Fish Habitat. Available at: http://www.nmfs.noaa.gov/habitat/efh/

National Park Service. 2001a. Seabeach amaranth surveys 1996-2000, Cape Hatteras

National Seashore. U.S. Department of the Interior, National Park Service, Cape Hatteras

National Seashore, Manteo, North Carolina. Unpublished data. 7 pp.

National Park Service. 2001b. Seabeach amaranth counts 1993-2000, Cape Lookout

National Seashore. U.S. Department of the Interior, National Park Service, Cape Lookout

National Seashore, Harkers Island, North Carolina. Unpublished data. 1 pp.

NatureServe. 2002. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.0. NatureServe, Arlington, Virginia. Available: http://www.natureserve.org/explorer. (Accessed: July 29, 2004).

New Jersey Department of Environmental Protection (NJDEP). 1997. Endangered Beach Nesting Bird Management on New Jersey's Municipal Beaches. NJDEP Division of Fish, Game and Wildlife: Endangered and Nongame Species Program, and the U.S. Fish and Wildlife Service (USFWS). http://www.state.nj.us/dep/fgw/ensphome.htm. (Retrieved 2001).

Pauley, E.F., M.B. Dietsch and R.E. Chicone, Jr. 1999. Survival, growth, and vegetation associations of the threatened *Amaranthus pumilus* (seabeach amaranth) on a South Carolina barrier island. Association of Southeastern Biologists Annual Meeting, April 1999. Wilmington, North Carolina. 1 p.

Raithel, C. 1984. The Piping Plover in Rhode Island. Rhode Island Natural Heritage Program, Providence, RI. Unpublished Report. 13 pp.

Ray, G. and D. Clarke. 1995. Baseline Characterization of Benthic Resources and Their Use by Demersal Fishes at a Beach Renourishment Borrow Site off Coney Island, New York. Prepared for the U.S. Army Corps of Engineers, New York District, Environmental Analysis Branch.

Ray, G. 1996. Characterization of Benthic Resources at a Potential Beach Renourishment Borrow Site in the Vicinity of Coney Island, New York: June to September 1995. Prepared for the U.S. Army Corps of Engineers, New York District, Environmental Analysis Branch.

Reid, R.N., D.J. Rodosh, A.B. Frame, and S.A. Fromm. 1991. Benthic Macrofauna of the New York of the New York Bight, 1979-89, NOAA Tech. Report, NMFS 103. 50 pp.

Rimmer, D.W., and R.D. Deblinger. 1990. Use of Predator Exclosures to Protect Piping Plover Nests. *Journal of Field Ornithology* 61:217-223.

Strand, A.E., and R. Hamilton. 2000. Outline of current and potential *Amaranthus pumilus* restoration ecology research projects. Waddell Mariculture Center, South Carolina Department of Naturla Resources. Bluffton, South Carolina. 8 pp.

Strauss, E. 1990. Reproductive Success, Life History Patterns, and Behavioral Variation in Populations of Piping Plovers Subjected to Human Disturbance (1982-1989). Ph.D. Dissertation, Tufts University, Medford, MA. 143 pp.

U.S. Army Corps of Engineers. 2001b. *Amaranthus* data 1996-2000. Wilmington District. Wilmington, North Carolina. Unpublished data. 7 pp.

United States Army Corps of Engineers (USACE). 2003. Final Avian Survey Summary Report for the Reformulation of the Shore Protection and Storm Damage Reduction Project, South Shore of Long Island, New York - Fire Island Inlet to Montauk Point. USACE, New York District, North Atlantic Division, October 2003.

United States Army Corps of Engineers (USACE). 2004. Final Small Mammal and Herpetile Survey Summary Report for the Reformulation of the Shore Protection and Storm Damage Reduction Project, South Shore of Long Island, New York - Fire Island Inlet to Montauk Point. USACE, New York District, North Atlantic Division, January 2004.

United States Fish and Wildlife Service (USFWS). 1982. Fish and Wildlife Resource Studies for the Fire Island Inlet to Montauk Point, New York, Beach Erosion Control and Hurricane Protection Project Reformulation Study. U.S. Department of the Interior, Fish and Wildlife Service, Region 5, Cortland Office, Cortland, NY.112 pp.

U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; determination of seabeach amaranth (*Amaranthus pumilus*) to a threatened species. 58FR 18035-18042.

U.S. Fish and Wildlife Service. 1994. Biological Opinion letter from the U.S. Fish and Wildlife Service, Cortland, NY, to Colonel Thomas A. York, District Engineer, New York District of the U.S. Army Corps of Engineers, New York, NY. December 20.

U.S. Fish and Wildlife Service. 1996b. Recovery Plan for Seabeach Amaranth (*Amaranthus pumilus*) Rafinesque. U.S. Department of the Interior, Fish and Wildlife Service, Atlanta, Georgia. 55 pp., plus appendices.

U.S. Fish and Wildlife Service. 2012 Piping Plover Site for the Atlantic Coast Population Available at: http://www.fws.gov/northeast/pipingplover/

Van Schoik, R., and S. Antenen. 1993. *Amaranthus pumilus* - Long Island, New York. Final Report submitted by the Long Island Chapter of The Nature Conservancy to the New York State Department of Environmental Conservation. 13 pp.

Weakley, A.S., and M. Bucher. 1992. Status Survey of Seabeach Amaranth (*Amaranthus pumilus* Rafinesque) in North and South Carolina, Second Edition (After Hurricane Hugo). Report to North Carolina Plant Conservation Program, North Carolina Department of Agriculture, Raleigh, NC, and Endangered Species Field Office, U.S. Fish and Wildlife Service, Asheville, NC. 178 pp.

Wilcox, L. 1959. A Twenty Year Banding Study of the Piping Plover. *Auk* 76:129-152.

Woodhead, P.M.J. 1992. Assessments of the Fish Community and Fishery Resources of the Lower New York Bay Area in Relation to a Program of Sand Mining Proposed by New York State. Stony Brook: Marine Science Research, SUNY at Stony Brook.

Young, S.M. 2003. Seabeach Amaranth, (*Amaranthus pumilus*), Global Positioning Satellite Survey - Long Island 2002. New York Natural Heritage Program, Albany, NY. 21 pp., plus appendices.

Zonick, C. A. 2000. The winter ecology of Piping Plovers (Charadrius melodus) along the Texas Gulf Coast.

Pertinent Correspondence

From:	Owen, Paul COL NAN
To:	David Stilwell
Cc:	Weppler, Peter M NAN02; Santomauro, Frank NAN02; Seebode, Joseph NAN; Ciorra, Anthony NAN02
Subject:	Section 7 Formal Consultation-FIMI (UNCLASSIFIED)
Date:	Tuesday, March 04, 2014 3:29:37 PM

Classification: UNCLASSIFIED
Caveats: NONE

David,

Our respective offices coordinated throughout the day of 4 March 2014 for the purpose of providing USFWS clarification on the project description for the proposed Fire Island Inlet to Moriches Inlet Stabilization Project (FIMI)

The following items were discussed:

1) Define the extent of vegetation management for the recommended areas - The extend to the vegetation measures will include the area the "berm crest to the bayside", not including tidal wetland vegetation.

Assume all areas within the polygons on the provided maps will be subject to devegetation (area near New Made Island, the recently closed Smith Point County Park breach, Pattersquash Island and Great Gun)

2) USFWS-LIFO will provide revised language during the Formal Consultation process as it pertains to the breakpoint (measures in % density) of which de-vegetation shall occur.

3) No sand fencing will be placed as part of the FIMI Project – The District will work with USFWS to discuss/enforce land management options with the local land owners (Suffolk County, Towns of Islip, Brookhaven, NPS).

4) American Beach Grass (Ammophila breviligulata) will be planted on 1 on 24 inch centers within the Dune Sections that have the 1V:5H slope. No plantings will occur on the dune sections that have 1V:10H slope.

5) Burma Road is assumed to be managed as it has been in the past by Suffolk County Parks.

6) The measures in the discussed in the mammalian predator monitoring plan will be further discussed as it pertains to trapping.

7) There is no bayside at Lighthouse Beach that is accessible to plovers.

8) The following Bullet on Page 47 will be revised to:

"• In Contract 2, the dunes will be realigned to meet up with existing dune line at the Lighthouse tract. The 15 foot dune will go from a 1 on 5 slope to a 1 on 10 slope to allow plover chicks access to

the bayside."

The District has agreed to implement the conservation measures specific to this BA (and as coordinated with DOI above) which will avoid and minimize the adverse impacts to the listed species and their habitat. Notwithstanding this fact, it is the District's determination that implementing the proposed action may affect and is likely to adversely affect the piping plover and seabeach amaranth. Consequently, the District requests that formal consultation pursuant to section 7(a)(2) of the Endangered Species Act be initiated as soon as possible.

Thanks.

Paul E. Owen, P.E.
Colonel, US Army Corps of Engineers
Commander, New York District
paul.owen@usace.army.mil
26 Federal Plaza
New York, NY 10278
917-790-8000

Classification: UNCLASSIFIED
Caveats: NONE

United States Department of the Interior

NATIONAL PARK SERVICE
FIRE ISLAND NATIONAL SEASHORE
120 Laurel Street
Patchogue, New York 11772
(631) 687-4750

IN REPLY REFER TO:

H-2415(FIIS)

January 16, 2014

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, New York 10278

Dear ~~Colonel Owen~~ Paul:

On December 19, 2013, I received email correspondence from Frank Santomauro, Chief of Planning for the New York District, U.S. Army Corps of Engineers (Corps) as a follow-up to a technical meeting held with Corps staff and representatives from the National Park Service (NPS), U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation, and Suffolk County, New York. The goal of the meeting was to investigate potential modifications to the proposed Fire Island to Moriches Inlet Stabilization plan (FIMI) that would provide increased protection and improved productivity for federally listed species under the Endangered Species Act. This letter provides the NPS response to Mr. Santomauro's letter.

The NPS was asked to comment on four proposals. Two proposals would occur on NPS lands and two would occur on Suffolk County land at Smith Point County Park, all four are within the boundary of Fire Island National Seashore. The two proposals that would occur on NPS lands recommended the realignment of proposed dunes further northward than previously proposed as part of Fire Island to Montauk Point Reformulation Plan (FIMP) to "preserve" piping plover habitat created by Hurricane Sandy as a result of over wash in the areas of Robbins Rest and the Fire Island Lighthouse. It was also recommended that the "preserved habitat would be monitored for the five year life of the project and, as determined by the monitoring results, appropriate actions (such as de-vegetation(sic)) taken to maintain early succession stages of plover habitat." For the Lighthouse tract grading was also identified as an action that could be undertaken as a part of the maintenance program.

The proposals for Smith Point County Park addressed dune realignment also to preserve habitat created by Hurricane Sandy where there was extensive over wash. In another area at Smith Point County Park the recommendation was to de-vegetate an area to reestablish piping plover habitat.

The NPS generally supports the proposals to realign the proposed dunes northward, where appropriate, to "preserve" habitat. However, as I discussed at the meeting on December 18, the maintenance of the habitat by means of de-vegetation and grading is not appropriate on NPS lands. *NPS Management Policies* direct the NPS to allow natural processes to take precedence and natural re-vegetation and sand accretion on beaches, berms and dunes are critical to a stable and sustainable barrier island. NPS will

monitor the Lighthouse tract and the Robbins Rest for piping plover and other threatened and endangered species and will, as we have always done, establish limitations and restrictions so as to protect listed species that nest or germinate in these areas, however, we cannot support the active manipulation of habitat in these areas.

Additionally, as I discussed on December 18, the Fire Island Lighthouse is a major feature of a National Register District, listed on the National Register of Historic Places. The Fire Island Light Station Historic District's boundaries run from the water line along the Atlantic Ocean to the water line of the Great South Bay and from the eastern boundary of Robert Moses State Park to a north/south line about 200 feet east of the NPS Ranger Station/Checkpoint located east of the lighthouse. Upon review of the Lighthouse Historic District's boundaries and consultation with NPS cultural resource compliance staff, it is clear that a formal, National Historic Preservation Act Section 106 consultation will be required regarding any actions being proposed for the Lighthouse tract within the National Register District. The first step in this process will require a cultural resource assessment to be undertaken by the Corps. Once that cultural assessment is completed, NPS will then begin the formal consultation process. Until such time as the NPS completes such a consultation we cannot concur with any action proposed for this area.

As part of FIMP planning, the NPS agreed to permit beach nourishment on NPS lands adjacent to Robbins Rest so as to ensure that the dune/berm system in this area was not weakened or compromised by a lack of nourishment in the reach between the communities of Atlantique and Fire Island Summer Club. Prior to Hurricane Sandy the NPS did not support beach nourishment in the Lighthouse tract. As a result of the extensive over wash at the Lighthouse tract and the loss of dunes in that area, the NPS agreed to nourishment in the Lighthouse tract to reestablish the berm and dune line in the general location it had been prior to Hurricane Sandy. The NPS support of nourishment in this area is to provide protection to the historic resources of the Fire Island Light Station Historic District and the primary, inland, vehicular emergency access route on and off Fire Island for the Fire Island communities.

Again, I want to reiterate that the NPS generally supports realignment of the dunes where appropriate but does not support maintenance activities on NPS lands that would de-vegetate naturally occurring vegetation and grade sand accretion that naturally occurs and are consistent with the natural processes of barrier islands. The NPS remains committed to working with the Corps to facilitate completion of this project. Thank you for the opportunity to provide these comments. If you have any questions, please contact me at 631-687-4752.

Sincerely,

K. Christopher Soller
Superintendent

cc: Frank Santomauro (USACE)
Peter Weppler (USACE)
Michael Caldwell (NPS)
Mary Foley (NPS)
Herbert Frost (NPS)
Rachel Jacobson (DOI)
Andrew Raddant (DOI)
Wendi Weber (USFWS)
David Stilwell (USFWS)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

January 9, 2014

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, New York 10278

Dear Colonel Owen:

This is the U.S. Fish and Wildlife Service's (Service) response to the U.S. Army Corps of Engineers (Corps) electronic mail attachment dated December 19, 2013, which provides the Corps' most recent project modifications for the proposed Fire Island to Moriches Inlet - Fire Island Stabilization Project (FIMI). The Corps' revised plans are based on feedback the Corps received during an interagency meeting held on December 18, 2013, between the Corps, National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), County of Suffolk (County), and the Service.

The overall purpose of the December 18, 2013, meeting was to continue discussing the project design features that the Corps should implement to meet requirements of section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), and to consider habitat restoration proposals that would further the restoration of degraded habitats and natural coastal processes in the project area. Prior to this meeting, the Service provided a number of recommendations in a letter to the Corps dated December 13, 2013 (enclosed), to avoid and minimize adverse effects to federally listed and proposed species, including the piping plover (*Charadrius melodus*; threatened), seabeach amaranth (*Amaranthus pumilus*; threatened), roseate tern (*Sterna dougallii dougallii*; endangered), and red knot (*Calidris canutus rufa*; proposed threatened). As noted in that letter, we developed our recommendations based on best available science, including the result of a long-term study funded by the Corps, on the effect of beach nourishment and dune construction on plovers, as well as other peer-reviewed and grey literature, and agency expertise.

The Service recognizes that this project presents a number of challenges to the Corps due to its complexity, scope (18 miles), timing, multiple jurisdictional coverage, land use and land ownership patterns, and the sensitive natural resources that are present, including off-shore, back-bay, and barrier island fish and wildlife resources, and species protected under the ESA and Migratory Bird Treaty Act (MBTA) of 1918, as amended. Consequently, we appreciate all your efforts to lead this planning effort, including fostering an open and collective dialogue among the

interagency team as we move forward. We also appreciate the Corps' affirmation of its obligations to avoid and minimize adverse impacts to threatened and endangered species under section 7(a)(2) of the ESA and to consider the Service's recommendations to avoid and mitigate impacts to other fish and wildlife resources pursuant to the Fish and Wildlife Coordination Act of 1958 (48 Stat. 401, as amended; 661 *et seq.*) and the MBTA.

In your December 19, 2013, letter, you inquire whether we concur that the modifications arrived at the meeting "...will, collectively provide for more suitable habitat over time than the currently proposed plan you were sent earlier this week." Further, you inquire whether our agency "...is in agreement with our assessment that the modifications described above would prove beneficial and serve to improve the status of the listed species within the stabilization project area." To these two points, we concur that the recommendations adopted by the Corps are an improvement over the earlier proposed plan and impact less habitat than the earlier proposal. As expressed earlier in this letter, we appreciate the Corps' efforts to make such modifications.

In addition to the improvements you have suggested, we reiterate that there are other possible alternatives available that could further diminish the impacts to habitat and provide storm protection. Our primary recommended alternative was to have no solid dune at Smith Point County Park, but to construct an enhanced berm. At the meeting, other alternatives were also provided and considered. The Corps presented a "staggered dune" approach at Smith Point County Park that would consist of two lines of dunes with overlapping staggered openings. This approach could: (1) Provide some overwash and ocean-to-bay habitat, which may prove beneficial to the piping plover; (2) provide sediment transport at low storm levels, and (3) prevent excess water movement at high storm levels. Although this approach would be experimental, it could provide the opportunity to study this for potential future use in other areas. The Service also suggests another alternative to having the dune extend the entire length of the park bisecting all of the newly created habitat. The Service suggests that at least one of the three overwash lobes should not have a dune constructed through it to preserve one of these premier habitat units. These ocean-to-bay overwash units have the highest potential to increase piping plover productivity among all habitat types on the barrier island system In addition to preserving a portion of this premier habitat, we will also have another opportunity to study plover response to the habitat creation. Although we appreciate monitoring and adaptive management of vegetation in specific Smith Point Park areas, preserving these ocean-to-bay overwash lobes is most likely to provide the most recovery benefits. Another alternative would be to have breaks in the dunes, such as being done at the Corps' project on Assateague Island. This would not be incompatible with the current system as numerous breaks are currently being maintained in the dunes for off road vehicle access to the beaches.

As the agencies reached satisfactory compromise in all the other project segments, we request you give reconsideration to the other alternatives for Smith Point County Park. The Service remains committed to working with the Corps to facilitate completion of this project. We are available for further discussion.

The Corps, as the action agency, will decide the final project design and provide a Biological Assessment to the Service. The Service will then complete our Biological Opinion based on the selected project design and Biological Assessment as expeditiously as possible.

Thank you for the opportunity to provide these comments. If you have any questions, please contact me at 607-753-9334.

Sincerely,

for David A. Stilwell
Field Supervisor

Enclosure

cc:

NYCOE, NY, NY (J. Seebode; P. Weppler; N. Brighton)
NPS, FINS, Patchogue, NY (C. Soller)
NPS, Boston, MA (M. Foley)
USGS, Woods Hole, MA (W. Schwab)
USGS, St. Petersburg, FL (C. Hapke)
DOI, OEPC, Boston, MA (A. Raddant)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

December 13, 2013

Colonel Paul E. Owen
District Engineer
U.S. Army Corps of Engineers
26 Federal Plaza
New York, NY 10278

Dear Colonel Owen:

This is in regard to the U.S. Army Corps of Engineers' (Corps) Fire Island Stabilization Project and the recent coordination between our offices pursuant to the Endangered Species Act of 1973, as amended (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) and Fish and Wildlife Coordination Act of 1958, as amended (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) (FWCA). The U.S. Fish and Wildlife Service (Service) has reviewed the preliminary project plans provided to our office via electronic correspondence dated December 9, 2013. The purpose of this letter is to provide early recommendations for discussion at the meeting scheduled for December 18, 2013, between our staff to advance the habitat restoration and to identify endangered species conservation measures.

We appreciate the opportunity to work closely with your office on this and other projects coordinated by the Corps' Planning Division, Regulatory Branch, and Operations Division, such as the Fire Island to Montauk Point Storm Damage Protection Reformulation Study (FIMP), Fire Island Inlet and Shores Westerly Navigation Project, and the various other projects around Long Island which were undertaken in response to Hurricane Sandy. As we have expressed in several meetings with you and your staff, the newly designated Fire Island Stabilization Project, as presented, includes features which would be counter to the long term survival and recovery of the piping plover (*Charadrius melodus*; threatened), present additional challenges for the recovery of the seabeach amaranth (*Amaranthus pumilus*; threatened), and likely limit the amount of suitable bay shoreline and ocean habitats to the red knot (*Calidris canutus rufa*), a proposed species for listing under the ESA. In addition, this project will have impacts to other migrating shorebirds such as the state-listed least tern (*Sterna antillarum*) and common tern (*Sterna hirundo*), as well as the American oystercatcher (*Haematopus palliatus*).

In terms of the plover, we have stated in a number of biological opinions on Corps' projects since the 1990s, that large-scale, long-term shoreline stabilizations will affect the ability of the species to recover and survive in the wild. Throughout the informal consultation process for the FIMP and the several times we met over the Fire Island Stabilization Project, we have recommended measures and restoration proposals that the Corps should incorporate into the project description to avoid jeopardy of the piping plover. Our recommendations were developed using the best available science and information on this species and were put forth in the spirit of assisting the Corps in avoiding jeopardy and advancing the Corps' Vision Statement "Restoration Framework," by focusing on the restoration of natural barrier island and back-bay processes, including but not limited to, cross-island and long shore sediment transport processes.

Based on our discussions on December 6, 2013, and the current project proposal we are offering recommendations for your consideration.

At this juncture, we have tailored our recommendations to help advance the Corps' objectives in the project in a manner which provides a level of storm damage protection to some of the most critically affected shoreline areas but which also avoids jeopardy to this listed species. As currently configured, the Corps plans a shoreline construction plan in some of the most optimal piping plover habitat created by Hurricane Sandy, especially in Smith Point County Park. Our preliminary recommendations on the entire plan, which stretches from Robert Moses State Park to Smith Point County Park, include consultation requirements, modifications to the dune alignment and berm construction layouts, and means to avoid and minimize indirect effects of the project are presented below.

Service Comments

1) As we have discussed, the Fire Island Stabilization Project will require formal consultation, and, therefore, and the preparation of a biological assessment by the Corps. 50 CFR Part 402 stipulates that once formal consultation is initiated, the consultation period is 135 days; however, we will do our best to expedite this action. Formal consultation would be required as the project prevents to a large degree the formation of natural geomorphic features on the barrier island by significantly reducing or preventing overwashes and breaches, which create habitats necessary for the recovery and survival of the piping plover and seabeach amaranth in the wild. The project will also have impacts to the red knot in New York by limiting the development of naturally created sand flats and bay shorelines. Formal consultation will also be required to address other indirect effects of the project including human disturbance, predation, etc.

2) We recommend that between Fields 2 and 3 in Robert Moses State Park that the dune alignment be shifted north to just north or south of the unimproved utility road. In this way, existing overwash and dune blow out habitats will not be significantly impacted by the proposed dune system. Berm placement can occur in the specified location at 9 ft National Geodetic Vertical Datum (NGVD) maximum elevation.

3) We recommend that in the federal Lighthouse Tract the dune alignment be shifted north to lie adjacent to the Fire Island National Seashore's western access road. This alignment will provide protection to the road and existing infrastructure but allow the naturally created overwash habitats to undergo natural succession unimpeded by the Corps' proposed location of the dune system. Berm placement can occur in the specified location at 9 ft NGVD maximum elevation.

4) We recommend that in the area between Atlantique and Robins Rest that the dune alignment be shifted north as much as feasible. Berm placement can occur in the specified location at 9 ft NGVD maximum elevation.

5) We recommend that the Corps' eliminate the proposed artificial dune system in Smith Point County Park stretching from just west of Pattersquash Island to the eastern extent of the proposed dune placement area. Berm placement can occur in this area in the specified locations at 9 ft NGVD maximum elevation and sand by passing should continue in this area to restore long shore sediment transport. As currently proposed, the construction of an artificial dune in this area would effectively eliminate the possibility of any bay to ocean overwash habitats (cross island transport) in areas where barrier island infrastructure is not a concern.

6) The Fire Island Stabilization Project will require measures to protect federally listed species and other state and federally protected -shorebird species such as common and least terns, American oystercatchers, and migrating shorebirds which might utilize the project area. Protection measures will need to be developed through the consultation processes of the ESA

and FWCA to address impacts related to recreational use of the beach, predators, and vegetation encroachment into listed species habitat. We had worked with the Corps on the development of a template for threatened and endangered species management for the larger FIMP and recommend that the Corps revitalize that effort, with the goal of developing a comprehensive management plan covering recreation, predator control, and vegetation across the Fire Island Stabilization Project Area.

We have also been in discussion and negotiation with the Planning Division on a multi-year Transfer of Funding Agreement that would enable us to work nearly exclusively on Corps' Hurricane Sandy Projects. We believe it is in the best interests of both our agencies to have your office finalize the latest version of the scope of work as soon as possible so we can begin to move forward and prepare the necessary reports your agency requires.

7) We support restoration projects in the back-bay areas except for areas near the naturally created overwash habitats in Smith Point. These areas should be allowed to function naturally. As you are aware, many of the proposed locations for restoration were in areas we recommended in 2008 as part of informal section 7 consultation. We would still like to discuss with you the feasibility of implementing those recommendations. Some of the other sites were the result of the Corps Habitat Evaluation Procedures analysis, and, generally, do not approach restoration on a landscape level.

As we move forward with addressing the current project proposal including the proposed actions in Smith Point County Park we note that during our section 7 analysis we will need to take into consideration that the conditions of the Breach Contingency Plan were not met in the breach filled areas. We strongly advise that this issue be resolved with the local cost share sponsor prior to the start of the 2014 piping plover breeding season (April 1). It would be beneficial for this issue to be resolved prior to any ESA section 7 analysis for this project being undertaken.

Thank you for the opportunity to review your latest plan prior to our meeting next week to discuss habitat restoration/mitigation and ESA conservation measures. If you have any questions, please have your staff contact Trisha Cole of the New York Field Office at 607-753-9334.

Sincerely,

Patricia Cole

for David A. Stilwell
Field Supervisor

cc: NYCOE, NY, NY (L. Houston)

From:	Alan Fuchs
To:	Weppler, Peter M NAN02
Cc:	Anna Servidone; Dawn McReynolds; Susan McCormick; gilbert.anderson@suffolkcountyny.gov
Subject:	[EXTERNAL] Re: FIMI Stabilization at Smith Point County Park - Technical meeting Follow - up
Date:	Friday, January 17, 2014 3:00:46 PM

Peter,
The State and County have reviewed the diagrams for the alignment and have not issues with them.
Al

>>> "Weppler, Peter M NAN02" <Peter.M.Weppler@usace.army.mil> 1/10/2014 10:11 AM >>>
Good Morning and Happy New Year,

As a product of the discussion held at the Dec 18th meeting on subject above, please find attached draft concept drawings for revised dune alignment for Smith Point County Park.

Please note that the dune segments must be straight lines and as shallow transitions as possible, but they can be modified during Plans & Specs for "fine tuning". The back slope can be modified slightly (one on four, or one on three) for a smaller foot print overall.

Your comments are welcome and appreciated by Jan 17, 2014.

Regards,
Peter

Peter Weppler
Chief, Coastal Ecosystem Section
U.S. Army Corps of Engineers - Planning
26 Federal Plaza - Room 2151
New York, NY 10278-0090
Tel: 917-790-8634
Fax: 212-264-0961

From:	Weppler, Peter M NAN02
To:	"david_stilwell@fws.gov"; "Patricia_Cole@fws.gov"; "steve_papa@fws.gov"; "Steve_Sinkevich@fws.gov"; "chris_soller@nps.gov"; "aafuchs@gw.dec.state.ny.us"; "Gilbert.Anderson@suffolkcountyny.gov"
Cc:	Verga, Frank NAN02; Couch, Stephen NAN02; Brighton, Nancy J NAN02; Smith, Robert J NAN02; Ashton, Karen NAN02; Bocamazo, Lynn M NAN02
Subject:	FIMI Stabilization at Smith Point County Park - Technical meeting Follow - up
Date:	Friday, January 10, 2014 10:10:00 AM
Attachments:	SKETCH2C-109-Plot-000.pdf SKETCH2C-108-Plot-000.pdf SKETCH2C-107-Plot-000.pdf SKETCH2C-106-Plot-000.pdf SKETCH2C-105-Plot-000.pdf SKETCH2C-104-Plot-000.pdf

---

Good Morning and Happy New Year,

As a product of the discussion held at the Dec 18th meeting on subject above, please find attached draft concept drawings for revised dune alignment for Smith Point County Park.

Please note that the dune segments must be straight lines and as shallow transitions as possible, but they can be modified during Plans & Specs for "fine tuning". The back slope can be modified slightly (one on four, or one on three) for a smaller foot print overall.

Your comments are welcome and appreciated by Jan 17, 2014.

Regards,
Peter

Peter Weppler
Chief, Coastal Ecosystem Section
U.S. Army Corps of Engineers - Planning
26 Federal Plaza - Room 2151
New York, NY 10278-0090
Tel: 917-790-8634
Fax: 212-264-0961