UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
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March 9, 2017 F/SER47:KR/pw

Colonel Kevin P. Landers Sr., Commander
U.S. Army Corps of Engineers Wilmington District
69 Darlington Avenue
Wilmington, North Carolina 28403-1398

Attention: Ronnie Smith

Dear Colonel Landers:

NOAA's National Marine Fisheries Service (NMFS) reviewed public notice SAW-2012-00040, dated February 8, 2017. The Village of Bald Head Island (Village) requests authorization from the Department of the Army to modify a permit for groin fillet maintenance and beach nourishment. Specifically, the Village seeks authorization to dredge a portion of Frying Pan Shoals and place the dredged material along the shoreline of Bald Head Island, including West Beach and South Beach. The Wilmington District's initial determination is the proposed project may adversely affect essential fish habitat (EFH) or associated fisheries managed by the South Atlantic Fishery Management Council (SAFMC), the Mid-Atlantic Fishery Management Council, or NMFS. For reasons detailed below, the NMFS agrees with this determination and concludes borrowing sand from Frying Pan Shoals may have long-term impacts to a substantial amount of shoal habitat the SAFMC designates EFH for cobia, Spanish mackerel, and king mackerel and the NMFS designates for Atlantic highly migratory species (tuna, swordfish, billfish, small and large coastal sharks, and pelagic sharks). In accordance with Part IV, Section 3(a) of the Memorandum of Agreement (MOA) between the Department of Commerce and the Department of the Army, dated August 11, 1992, the NMFS has also determined the mining of Frying Pan Shoals may lead to substantial and unacceptable impacts to aquatic resources of national importance (ARNI). As the nation's federal trustee for the conservation and management of marine, estuarine, and diadromous fishery resources, the NMFS provides the following comments pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Description of the Proposed Project
The Village has relied on a variety of shoreline management actions to address chronic erosion on the western end of South Beach, The Point, and West Beach over the past 18 years. The most recent project, completed in December 2015, included construction of a 1,300-linear-foot terminal groin concurrent with a federal beach disposal operation on Bald Head Island. Recent physical monitoring reports the average annualized loss is 371,700 cubic yards of sand from West Beach and South Beach. Previous groin fillet maintenance and beach nourishment projects used material sourced from the Wilmington Harbor Federal Navigation Project and Jay Bird Shoals. Since 2001, Bald Head Island has received 250,000 to 366,000 cubic yards of sand per year from the Wilmington Harbor Federal Navigation Project. The Wilmington District has committed to continue contributing beach compatible sand from the Wilmington Harbor Federal

Navigation Project to the Village for beach nourishment activities. Other sources of material approved in the current permit for beach disposal are located on Jay Bird Shoal and Bald Head Creek Shoal.

The Village wants to secure an additional long-term source of material for groin fillet maintenance and beach nourishment. The Village has identified a borrow source located within a 460-acre site on the western portion of the Frying Pan Shoals formation, approximately one mile off the southeast shoreline of Bald Head Island. Sediment would be excavated to a depth up to -25 feet by cutter suction dredge and pumped by submerged pipeline to the shoreline of Bald Head Island. The identified borrow site could yield up to 8.5 million cubic yards of sand material meeting North Carolina's standards for beach compatibility. Because of draft restrictions to access the borrow source, the Village also seeks authorization for the dredge plant to excavate a fairway (channel) to access the borrow location. The effective width of the fairway would not exceed 400 feet and the affected area would be approximately 22.5 acres. The public notice does not discuss the fate of the material dredged for the fairway, and it is not clear if the material is suitable for beach disposal. Hence, impacts from dredging the fairway may exceed the amount stated.

The Village proposes to conduct physical monitoring of the borrow site immediately after dredging, annually for three years, and biennially thereafter until the permit expires in November 2024. The footprint of each monitoring survey would include the entire permitted nourishment site as well as the area of excavation within Frying Pan Shoals. The results of the monitoring would be incorporated into the Village's existing Shoreline Monitoring Program annual report. The Village does not propose any environmental surveys or ecological studies of affected fisheries or fish habitat.

Consultation History

The NMFS participated in a scoping meeting with the Village, North Carolina Division of Coastal Management, North Carolina Wildlife Resources Commission, U.S. Fish and Wildlife Service, and the Wilmington District on November 4, 2016. The NMFS expressed concerns that a project of this scope may affect EFH associated with an important cape-associated shoal complex. The NMFS recommended a more thorough alternatives analysis be completed and recommended the analysis include additional sources of material from the Wilmington Harbor Federal Navigation Project (e.g., Outer Ocean Bar and Mid-River) and the Wilmington Harbor Ocean Dredged Material Disposal Site. The NMFS also recommended the Village investigate other offshore sand sources not affiliated with the Cape Fear inlet and shoal complex (e.g., Outer Continental Shelf).

The NMFS commented extensively in review of the Environmental Impact Statement (EIS) entitled, *Village of Bald Head Island Shoreline Protection Project*, dated August 2014, and its EFH Assessment, dated January 2014. The NMFS comments noted significant errors and omissions in these documents. The NMFS provided guidance on interpretations of impacts to fisheries. The NMFS provided an EFH conservation recommendation requesting the permit authorizing the terminal groin and beach nourishment not include dredging of sand from Frying Pan Shoals without further EFH consultation and in-depth review of environmental impacts. The

Wilmington District agreed, and the permit it issued did not authorize dredging in Frying Pan Shoals.

Essential Fish Habitat and Aquatic Resources of National Importance
Pursuant to the Magnuson-Stevens Act, the SAFMC and NMFS designate EFH within the study area to include tidal inlets and cape-associated shoal complexes because these areas provide feeding, resting, and staging habitat for a variety of commercially, recreationally, and ecologically important fish species. The SAFMC also designates these areas as an HAPC under the fishery management plans for shrimp, snapper/grouper complex, and coastal migratory pelagic species because these areas are rare, sensitive to stress and disturbance, and important to ecosystem function. Understanding how tidal inlets and shoals function to provide habitat is the product of a complex mix of connections between biological processes and physical factors. The cape-associated shoal complexes of North Carolina are known "hot-spot" environments where dense aggregations of fish are supported by local primary production. The SAMFC provides additional information on the species it manages and their EFH in *Fishery Ecosystem Plan of the South Atlantic Region* (available at *www.safmc.net*), and the NMFS provides additional information on the EFH of highly migratory species in *Amendment 10 to the 2006 Consolidated HMS Fishery Management Plan: Essential Fish Habitat* (available at *www.nmfs.noaa.gov/sfa/hms/*)

Several fish and invertebrates inhabiting the project area are ARNI in accordance with Section 906(e)(1) of the Water Resources Development Act of 1986 (PL 99-602), including bluefish (*Pomatomus saltatrix*), spotted seatrout (*Cynoscion nebulosus*), croaker (*Micropogonias undulatus*), southern flounder (*Paralichthys lethostigma*), blue crab (*Callinectes sapidus*), Spanish mackerel (*Scomberomorus maculates*), pompano (*Trachinotus carolinus*), and penaeid shrimp.

Impacts to Essential Fish Habitat
The Wilmington District and NMFS evaluated EFH impacts from dredging sand at Jay Bird Shoals, Bald Head Creek Shoal, and the Wilmington Harbor federal channel during the original EFH consultation for this project. Consequently, this additional review focuses on the EFH impacts from dredging sand at Frying Pan Shoals.

The North Carolina coast consists of a series of cuspate bays or coastal compartments, each with different spatial orientations and a geologic character reflecting the adjacent continental shelf (McNinch and Luettich 2000; Riggs and Ames 2009). Frying Pan Shoals, like the other cape-associated shoal complexes in North Carolina, is a prominent feature extending to the continental shelf break. Among the three cape-associated shoal complexes, Frying Pan Shoals extends the farthest, approximately 30 miles. Each of the cape-associated shoal complexes appears to have large volumes of high quality, beach compatible sand (Riggs et al. 2011). Cape-associated shoal complexes are constantly changing. They shift under normal current regimes, but storm events are largely responsible for sediment transport, sand distribution, and shoal migration. Wind-driven currents and storm-induced waves suspend sediment causing frequent erosion and deposition on the seabed. A significant knowledge gap exists in understanding the role of cape-associated shoal complexes in the function and maintenance of North Carolina's barrier island system (Kalo and Schiavinato 2009). It is entirely unknown how barrier islands and longshore

coastal currents will respond to dredging and removal of large volumes of sand from Frying Pan Shoals. There is potential for significant short-term and long-term physical and biological impacts from dredging shoal habitat.

Frying Pan Shoals is characterized by a high fish production, a high benthic faunal density, and species diversity. The Shoals are critically important for fisheries as it demarcates the boundary where the Labrador Current flowing south collides with the Gulf Stream Current flowing north. This biogeographical boundary plays a key role in supporting shrimp, the snapper-grouper complex, coastal migratory pelagic species, and highly migratory species by generating localized areas of high productivity. Upwelling in frontal eddies and summer bottom intrusions driven by the Gulf Stream contribute to this productivity by providing nutrient rich waters and a succession of biological responses (Lee et al. 1991).

Shoal habitat is defined by such factors as exposure, sediment texture, depth, and rugosity. The NMFS is primarily concerned about the impacts of dredging on prey resources and foraging habitat provided by the Frying Pan Shoal complex. Benthic invertebrate communities consisting of crustaceans, worms, and mollusks are diverse and productive despite the high-energy disturbance regime affecting the Shoal complex. Infaunal species provide important trophic linkages coupling benthic-pelagic ecosystems. Many of the organisms utilizing these habitats also provide trophic linkages between inshore and offshore populations. Succession and recovery of benthic communities established in shallow high-energy environments may reflect the adaptation of communities that occur in these habitats to frequent disturbance from episodic storm events (Normandeau Associates 2014). Potential impacts caused by dredging include physical removal of benthic faunal communities and disturbance of foraging habitat for fish and invertebrates. Dredging can also affect benthic communities by altering sediment transport characteristics of a shoal favoring sedimentation instead of resuspension. Benthic impacts are expected to be reflected in measures of abundance, biomass, and taxa richness. Several practices have been suggested to reduce recovery times for benthic communities following dredging events. Most important is ensuring dredging activities do not create a depression in which fine sediments deposit and collect. This may change the sediment composition and associated infaunal assemblages, which is essential for recovery and recolonization (Byrnes et al. 2004; Crowe et al. 2016). Also, timing of dredging prior to the peak recruitment period of spring and summer, along with the preservation of local refuge patches to maximize the rate and success of benthic recolonization have also been suggested to improve recovery times (Byrnes et al. 2004; Brooks et al. 2006).

The NMFS believes dredging and alterations of habitat on Frying Pan Shoals could affect spatiotemporal longshore movements of migratory fish species by disrupting feeding behavior (i.e., movement based on patchy food availability) and by disrupting a significant orientation cue for migration. Frying Pan Shoals serve as a migratory corridor for many species that traverse the coastal waters of the Southeast. Data on fish migration through North Carolina's cape-associated shoal complexes are sparse (Schwartz 1989). Anadromous species are the most common and well known fish to exhibit longshore migratory behavior. Anadromous species have complex lifecycles where individuals migrate great distances along the continental shelf and then return to their natal rivers to spawn. In the Southeast, Atlantic sturgeon, shortnose sturgeon, striped bass, American shad, and blueback herring move along and across the shoal habitat multiple times

throughout their life cycle. Sexually mature adults move across the shoals to aggregate and stage at river mouths and inlets prior to spawning migration in rivers. Similarly, young-of-year emerge from estuaries and migrate across the shoals en route to the waters of the North Atlantic for growing. Inlets and nearshore shallow areas with predominantly sandy substrate are particularly important refuge and foraging habitat for sturgeon and other anadromous species (Laney et al. 2007; Taylor et al. 2016).

A number of marine species seasonally migrate across the shoals. Cobia is a popular recreational and commercial species distributed worldwide in tropical, subtropical, and warm-temperate waters. Cobia are abundant in the warm waters off the coast of the U.S. from Virginia south throughout the Gulf of Mexico. The SAFMC manages cobia as part of the Coastal Migratory Pelagics Fishery Management Plan because the species is highly migratory. In late spring, schools of fish begin to migrate north from Florida. Migration and movement correlate with water temperature. Schools of migrating fish occur throughout coastal waters moving along beaches and the nearshore environment. Cobia form large spawning aggregations off North Carolina in May and June.

There are numerous other examples of spatial movement patterns of fish across Frying Pan Shoals at various temporal scales. Atlantic menhaden form large schools that migrate between inshore and offshore waters foraging on plankton. During fall and early winter, menhaden migrate south around the North Carolina capes to spawn (ASMFC 2015). The accumulation of menhaden and other schooling planktivores (e.g., anchovies, sardines, herring, and scad) on the shoals attract pelagic predators such as Spanish mackerel, king mackerel, and coastal sharks.

The NMFS is concerned the systematic dredging of cape-associated shoal complexes, such as the proposed project and subsequently other projects, may result in cumulative and unanticipated changes in habitat quality. Although opportunistic invertebrate communities may repopulate these areas after dredging, benthic populations may not recover to pre-project levels. Dredging will also suspend any fine material in the borrow area which may clog the gills in young, less mobile fish and invertebrates and thereby increase their mortality rates within assemblages. The extent of negative effect is dependent on the life history stages of the species present and the duration of the event. Frying Pan Shoals are a long-established seascape feature unique to North Carolina that provides valuable habitat for fishery resources utilizing estuaries and offshore waters as a part of their life cycle. Avoiding dredging of sand from this shoal complex would ensure that these important areas would not be altered to the point they no longer provide valuable habitat.

Monitoring Needed for the Dredging Impacts

To fully evaluate the proposed mining of Frying Pan Shoals for sand, the NMFS requires additional information regarding the rates at which borrow areas are expected to fill and measures the Wilmington District may require the Village to take to limit dredging to portions of the Shoal expected to fill in most rapidly. The NMFS also requires information on the biological monitoring the District may require quantifying whether the actual impacts to EFH are within acceptable limits. To characterize distribution, abundance, biomass, and diversity of fish and invertebrates on the Shoal complex, the NMFS recommends using fishery-independent surveys

that include a combination of active sampling (e.g., trawling) and passive sampling (e.g., acoustic surveillance technology).

Dredging Best Management Practices
The NMFS requests the District develop best management practices (BMPs) to minimize the adverse effects from dredging the shoal-complex and provide these for review before the District makes its final decision on the proposed permit modification. For example, limiting the dredging to the prevailing downdrift flanks of the shoals and limiting the depth of the dredge cuts to ten feet may be good practices. Dredging within the shoal-complex should be limited to the portions of the shoal expected to fill in most quickly once dredging has stopped. Environmental windows (seasonal restrictions) should be used to limit the timing of dredge and disposal activities to protect fish during sensitive life stages.

Impacts to Aquatic Resources of National Importance
Several fish and invertebrates known to inhabit the project area are ARNI in accordance with Section 906(e)(1) of the Water Resources Development Act of 1986 (PL 99-602), including bluefish, spotted seatrout, croaker, southern flounder, blue crab, Spanish mackerel, pompano, and penaeid shrimp. These species utilize sandy shoals for spawning, refuge, foraging, or nursery areas. As proposed, the work could directly and permanently eliminate a substantial amount of sandy shoal habitat. Indirect impacts to this habitat and the ARNI that depend upon the Shoals also may result from the altered wave climate caused by removing a substantial portion of the Shoal. These indirect and cumulative impacts from the proposed action include increased turbidity and sedimentation from placement of fill in the aquatic environment and loss of food production functions performed by sandy shoals.

EFH Conservation Recommendations

Section 305(b)(4)(A) of the Magnuson-Stevens Act requires the NMFS to provide EFH Conservation Recommendations for any federal action or permit which may result in adverse impacts to EFH. Therefore, the NMFS recommends the following to ensure the conservation of EFH and associated fishery resources:

1. The excavation of Frying Pan Shoals for terminal groin maintenance and beach nourishment should be eliminated from the project design. The NMFS would reconsider this recommendation based on receipt of additional environmental analysis performed including an EFH Assessment addressing the proposed permit modifications.
2. An alternatives analysis should be done to identify whether Frying Pan Shoals is the least environmentally damaging practicable alternative sand source the Village could use during the remainder of the permit period. This analysis should include examination of additional offshore sources, including those in the Outer Continental Shelf, capable of providing beach compatible sand.
3. A physical and biological monitoring plan for the offshore borrow areas should be developed to more accurately determine impacts to shoal habitat. The objectives of the monitoring should include documenting the extent and grain-size distribution of the material filling the excavation sites. Environmental monitoring should also document biological components of the ecosystem, including fish, invertebrates, and infauna, to quantify recovery and whether the actual impacts to EFH are within acceptable limits.

4. BMPs should be developed to minimize the adverse impacts associated with dredging Frying Pan Shoals and integrated into the project design. For example, limiting the dredging to the prevailing downdrift region of the shoal and limiting the depths of the dredge cuts to ten (10) feet may be good practices. Similarly, restricting the time of year for construction activities including dredging, groin maintenance, and beach nourishment, should be included to reduce impacts to EFH and vulnerable life stages of federally managed fishery species. Please provide a list of BMPs to NMFS for review before the District makes its final decision on the proposed permit modification.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and implementing regulation at 50 CFR Section 600.920(k) require the Wilmington District to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, in accordance with the "findings" with the Wilmington District, an interim response should be provided to the NMFS. A detailed response then must be provided prior to final approval of the action. The detailed response must include a description of measures proposed by the Wilmington District to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with the EFH conservation recommendations, the Wilmington District must provide a substantive discussion justifying the reasons for not following the recommendations.

Closing

Thank you for the opportunity to provide these comments. Please direct related questions or correspondence to the attention of Dr. Ken Riley at our Beaufort Field Office, 101 Pivers Island Road, Beaufort, North Carolina 28516-9722. He may be reached by telephone at (252) 728-8750 or by e-mail at Ken.Riley@noaa.gov.

Sincerely,

Virginia M. Fay
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