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

September 28, 2020

Lt. Colonel David Park
District Engineer
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

RE: Diamond State Port Corporation; CENAP-OP-R-2019-278

Dear Lt. Colonel Park:

With respect to the Diamond State Port Corporation (DSPC) permit application noted above and for the reasons described below, at this time we must recommend that the Department of the Army (DA) permit for the Edgemoor Port Site project not be issued. We have reviewed the following information provided to us regarding DSPC's DA permit application to develop a new, multi-use containerized cargo facility ("Edgemoor Port Site") associated with the Port of Wilmington at the former Chemours Edgemoor manufacturing facility on the mainstem Delaware River in New Castle County, Delaware:

- Essential fish habitat (EFH) assessment dated January 2020;
- the Corps' letter stating the EFH assessment was prepared on behalf of the District and requesting the initiation of an EFH consultation dated September 4, 2020;
- project application documents with various dates ranging from July 2016 to July 2020, including the Biological Assessment for Endangered Species;
- Public Notice (PN) CENAP-OP-R-2019-278, dated September 1, 2020; and
- *Revised* PN CENAP-OP-R-2019-278 dated July 30, 2020 (original July 24, 2020 PN).

Based on the information provided to us in the documents listed above, we have significant concerns about the proposed project, its impact to aquatic resources, the adequacy of the project purpose and need documentation, and the lack of a full and complete analysis of alternatives to avoid or minimize the adverse effects and compensatory mitigation for unavoidable impacts. We are also deeply concerned that the District and DSCP seem to have discounted decades of data on the aquatic resources found within the project area collected by the State of Delaware, the State of New Jersey, and others in favor of extremely limited and inadequate survey data produced by DSPC's consultant. In addition, both the EFH assessment and the Biological Assessment provided to us are incomplete, and lack a comprehensive evaluation of direct, indirect, individual, cumulative, and synergistic effects in the assessments and application materials provided. This is especially concerning since we provided the District with extensive comments on the consultations required, aquatic resources under our purview, site-specific resources and habitat, in our February 28, 2019, response to the District's request for National Environmental Policy Act (NEPA) scoping comments.

Due to the significant impacts that will result from this project, the incomplete consultation, and the numerous inaccuracies and inadequacies in Districts' analysis of effects as discussed in the attached document, our recommendation that the DA permit for this project not be issued at this time is in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies, due to the substantial and unacceptable impacts to aquatic resources of national importance. These resources include: American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*Morone saxatilis*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*) as well as the potential permanent impacts to Cherry Island Flats, a highly productive area for a number of commercially and recreationally important species including striped bass, and an extremely popular recreational fishing area. In addition, based upon the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA), we also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project. We have provided detailed comments on the proposed project and our concerns in the attached document.

Magnuson Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with one another on projects such as this that may adversely affect EFH. In turn, we must provide recommendations to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure.

In the attached document, we discuss the inadequacies of DSCP's data and analyses including those in the EFH assessment. The EFH assessment provided to us is based upon incomplete and flawed data and does not evaluate the adverse effects of the project on EFH. As a result, it cannot be considered complete. Typically, in cases where the EFH assessment is not complete, we either withhold issuing EFH conservation recommendations until a complete assessment is provided, or we base our recommendations on the available information. In order to assist you in your public interest review and the evaluation of project effects, it seems appropriate to issue the following EFH conservation recommendation pursuant to section 305(b)(4)(A) of the MSA:

- The construction of the proposed Edgemoor Port Facility should not be authorized unless, through the preparation of EIS or other publicly reviewed comprehensive NEPA document it can demonstrate:
    - The justifiable project purpose and need;

- that no alternate sites are available within the region;
- that the impacts to aquatic resources have been avoided and minimized to the maximum extent practicable; and
- that suitable compensatory mitigation can be provided that offsets fully all of the project's direct and indirect effects on aquatic resources and their habitats, including the effects on anadromous fishes and benthic and pelagic habitats.

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

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA), as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider effects that these projects would have on fish and wildlife and must also provide for improvement of these resources. From the information provided, the project will have substantial and unacceptable impacts to aquatic resources that we seek to conserve and enhance under the FWCA, particularly anadromous species such as alewife, blueback herring, American shad, and striped bass. In addition, the loss and degradation of important habitat for these species, the impacts to early life stages from the operation of the facility, and the lack of any compensatory mitigation to offset the adverse effect do not support the FWCA's requirement to provide for the improvement of the fish and wildlife resources.

Endangered Species Act

As stated in our February 28, 2019, letter, the following protected species and critical habitat may be affected by the proposed project: Shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), Kemp's Ridley turtle (*Lepidochelys kempii*), Leatherback turtle (*Dermochelys coriacea*), Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), North Atlantic Right whale (*Eubalaena glacialis*), Fin whale (*Balaenoptera physalus*). In addition, critical habitat of Atlantic sturgeon has also been designated with the Delaware River.

The Endangered Species Act (ESA) requires federal agencies (in this case, the District) to ensure, in consultation with us, that any action authorized, funded, or carried out by them is not likely to jeopardize species listed under the ESA or destroy or adversely modify critical habitat. An interagency consultation, pursuant to section 7 of the ESA, for the proposed project is necessary, and has been started by the District. It is important to note that in the regulations implementing section 7(a)(2) of the ESA (interagency consultation), "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Staff from our Protected Resources Division have been coordinating with your staff to address the deficiencies in the Biological Assessment provided to us.

As always, we hope that this issue can be resolved at the staff level and we welcome the opportunity to meet with you to discuss our comments and concerns. If you would like to discuss this matter further, please contact Keith Hanson at (410) 573-4559 or keith.hanson@noaa.gov with our Habitat Conservation Division and/or Peter Johnsen at (978) 281-9416 or peter.b.johnsen@noaa.gov with our Protected Resources Division.

Sincerely,

Michael Pentony
Regional Administrator

cc: USACE - J. Brundage, T. Schaible, A. DiLorenzo, S. Sanderson
NMFS GARFO - P. Johnsen; M. Murray-Brown
NOS - S. Hahn
USFWS - C. Guy, J. Thompson
EPA Region III - J. Davis
DNREC - M. Stangl, M. Greco
NJDEP- S. Biggins
PFBC - D. Pierce, T. Grabowski
MAFMC – C. Moore
NEFMC -T. Nies
ASFMC - L. Havel

ATTACHMENT – NOAA FISHERIES Comments
Diamond State Port Corporation; CENAP-OP-R-2019-278

Introduction

We have significant concerns about the proposed project, its impact to aquatic resources, the adequacy of the project purpose and need documentation, and the lack of a full and complete analysis of alternatives to avoid or minimize the adverse effects and compensatory mitigation for unavoidable impacts. In addition, both the EFH assessment and the Biological Assessment provided to us are incomplete. As a result, we must recommend that Department of the Army permit for this project not be issued at this time in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies due to the substantial and unacceptable impacts to aquatic resources of national importance including American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*) and striped bass (*Morone saxatilis*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*). We also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project due to the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA). Our detailed comments are provided below.

Project Description

According to the PN, DSPC is seeking authorization to hydraulically dredge 3,325,000 cubic yards (cy) of material from 86.9 acres of the Delaware River to create a new access channel between the existing Delaware River Federal Navigation Channel and the proposed Edgemoor Port Site. The access channel would have a maintained depth of -45 feet (ft.) mean lower low water (MLLW), though current water depths range from intertidal to -35 ft. MLW including a 450 to 550 ft. wide subtidal flat with depths of -10 ft. MLW or less.

According to the PN, approximately 10% of the total volume of material to be dredged including (fluvial sand) sediments containing PCBs, dioxin, arsenic, and thallium at concentrations above human health screening levels will be placed in a confined disposal facility (CDF) on uplands on the project site. This material will later be used as fill material on the site including a 5.5-acre area of the Delaware River landward of the proposed bulkhead. The remaining materials are proposed to be placed at several Corps of Engineers-owned confined disposal facilities (CDFs) including Wilmington Harbor North, Wilmington Harbor South, Reedy Point North and Reedy Point South. Following the initial dredging episode, it is anticipated that the access channel and berth site would require the maintenance removal of approximately 500,000 cy of accumulated sediment annually; all material will also be disposed of in the Corps' CDFs.

DSPC also proposes to construct an approximately 7.5-acre wharf supported by 4,500 20-inch diameter, concrete-filled steel pipe piles. The direct fill associated with the piles is 0.23 acres of river bottom. Although the PN does not clearly state the length and width of this structure, it appears that the wharf will extend at least 2,600 linear ft. along the shore and extend 112 ft. waterward of a proposed sheetpile bulkhead. According to the PN, approximately 5.5 acres of river below the high tide line will be filled landward of the bulkhead. Additional details in the application materials indicate that the area to be filled are intertidal and subtidal shallows, but detail on how far waterward from the high tide line and the length of the proposed bulkhead is lacking. As mentioned above, a portion of the fill material are sediments contaminated with a variety of toxic compounds.

The *Biological Assessment for Endangered Species* included with the application materials also states that the action will involve the removal of two existing wooden dock structures and remnant timber piles. The piles in the dredging area will be removed using vibratory methods. Piles outside of the dredging area will be cut off at the mudline, and some of the timber piles along the shore may be left in place. It appears this information is only included in the Biological Assessment, and is unclear why these elements of the proposed action were not discussed or included in the PN or EFH Assessment.

Along the riverfront face of the wharf, DSPC proposes to install and operate 13 anti-sedimentation fans, also known as shoaling fans, spaced every 200 ft. along the wharf face. The fans within the units are configured to rotate at speeds of approximately 275 revolutions per minute and provide a 4-inch screen at the larger intake end with an open space of 1.5 ft. between the blades. While not described in the PN or the EFH assessment, the additional application materials provided to us also mention the removal of two existing wooden dock structures and remnant timber piles within the project area, but the number of piles and their location is unclear.

The PN also states that because the proposed activities would not cause the loss of wetlands or other special aquatic sites, the DSPC has not proposed any compensatory mitigation. In addition, DSPC has indicated its intention to make a separate application to the District, requesting that future maintenance dredging of the access channel be assumed by the District as part of the federally authorized Philadelphia to the Sea Federal Navigation Project and will be requesting permission to dispose of most of the dredged material into the Corps-owned CDFs.

Early Coordination/Permitting Process

We have a number of concerns regarding the lack of early coordination with the federal resource agencies and the process being followed for the authorization of this project. We understand that this project was discussed at a meeting with representatives of the State of Delaware several years ago, but none of the federal resource agencies were advised to attend this meeting. For large and complex projects such as this one, it has been past practice to have one or more interagency meetings with all of the relevant state and federal agencies prior to the issuance of the PN. Post-PN interagency meetings or calls are also common to help resolve issues, answer questions and discuss information needs. Unfortunately, there have been no such meetings or calls for this project. These meetings, particularly when held prior to the issuance of the PN are an essential part of the coordination process between our agencies and are vitally important to ensure we have sufficient information to complete consultations required under the Fish and Wildlife Coordination Act (FWCA), the Magnuson Stevens Fishery Conservation and

Management Act (MSA), and the Endangered Species Act (ESA). Because this early coordination was not held, the information provided to us is not sufficient to complete these consultations and does not support the conclusions in the PN or the EFH assessment. Should this project move forward in the permitting process, we strongly recommend interagency meetings be scheduled.

Although there have been no interagency meetings or calls on this project, we have provided your Planning Division with extensive scoping comments in our February 28, 2019, letter in response to a NEPA scoping letter from Mr. Peter Blum dated December 17, 2018. The District's NEPA scoping letter stated that, at the time of the letter, the District was acting as a neutral party on the project in order to gather information and assist with coordination and potential impacts in accordance with NEPA. Our response letter contained information on consultations, aquatic resources under our purview, site-specific resources and habitat, and other information. We have yet to see any response to our comments or receive any updates of the status of the NEPA evaluation for this project. As a result, it remains unclear where this project is in the NEPA process.

We appreciate that your staff has provided us with the application package submitted by the DSPC. The materials provided include a document titled "Environmental Assessment Technical Document " dated March 2020 (revised June 2020), which included over twenty-four (24) appendices, and various modeling documents. Due to the volume of material and the manner in which the information has been presented (e.g., some information is included in one document, but not others), it is difficult to locate all the relevant information needed for our review. In addition, while your September 4, 2020, cover letter initiating EFH consultation made clear that the DSPC's EFH assessment (Appendix 11) was prepared on behalf of the District, it is unclear at this time if you are fully adopting all of the DSPC's additional documents as your own to represent your NEPA documentation or if you are in the process of developing your own NEPA analysis and documentation. It is also unclear at what point during the permitting process you will make such NEPA analyses and documentation available to the public for review and comment.

In addition to providing NEPA scoping comments, our Habitat Conservation Division was contacted by the project consultant on June 24, 2019, to provide informal comments on their benthic and fisheries survey plan. We provided these comments, which detailed various shortcomings and deficiencies with their survey plan, to them on June 28, 2019. We were not contacted again by the consultant to review or discuss the comments, provide clarifications, or further discuss their survey plan, including potential modifications made after reviewing our comments. We were also not contacted by the District to review the proposed sampling plan or its results. Unfortunately, as a result, the sampling undertaken by the DSPC is inadequate and does not by itself accurately characterize the aquatic resources and habitats affected by the proposed project.

Authorities

As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, we offer the following comments on resources of concern to us in the study area pursuant to the authorities of the MSA, FWCA, and ESA

Magnuson Stevens Fishery Conservation and Management Act

The MSA requires federal agencies to consult with one another on projects such as this that may adversely affect EFH. In turn, we must provide recommendations to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure.

EFH is defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The term "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and aquatic areas historically used by fish, where appropriate while "substrate" includes sediment, hard bottom, structures underlying waters and associated biological communities.

The EFH final rule published in the Federal Register on January 17, 2002, defines an adverse effect as: "any impact which reduces the quality and/or quantity of EFH." The rule further states that:

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

According to the District's September 4, 2020, letter requesting the initiation of the EFH consultation, DSPC's EFH assessment was used to inform your decision-making regarding the effects of the project on EFH and was the technical and scientific basis of your determination, which concluded that the DA authorization for the proposed project, if issued, may adversely affect EFH, but that it would not have the potential to cause substantial adverse effects on EFH. In order to mitigate the adverse effects of the work on EFH, the District intends to condition any DA permit to prohibit in-water work in any year during the period March 1 to June 30 to protect fish migrations and spawning activities. In addition, any DA permit would be conditioned such that pile installation would be conducted using the soft-start and vibratory methods in order to reduce noise.

While we appreciate the proactive avoidance and minimization measures that would take place during the construction and maintenance phases of the proposed project, we disagree with the District's conclusions regarding impacts to EFH, federally managed species, their prey, and other resources under our purview. As proposed, the project would result in substantial, significant, and unacceptable impacts to aquatic resources under our purview, including aquatic resources of national importance. Additionally, the EFH assessment concluded there was "a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas" and that "no habitat of value was identified within the affected environments." This conclusion is not supported by data or existing literature, and is directly contradicted by numerous studies cited in the documents provided to us and the DSPC's own project-specific data. Furthermore, the EFH assessment provided fails to fully evaluate all of the individual, cumulative, and synergistic direct and indirect effects of the project on EFH, and we must consider it to be incomplete.

Fish and Wildlife Coordination Act

The FWCA, as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider effects that these projects would have on fish and wildlife and must also provide for improvement of these resources. Under this authority, we work to protect, conserve and enhance species and habitats for a wide range of aquatic resources such as shellfish, diadromous species, and other commercially and recreationally important species that are not managed by the federal fishery management councils and do not have designated EFH.

Based upon the information provided, the project will have substantial and unacceptable impacts to aquatic resources that we seek to conserve and enhance under the FWCA, particularly anadromous species such as alewife, blueback herring, American shad, and striped bass. In addition, the loss and degradation of important habitat for these species, the impacts to early life stages from the operation of the facility, and the lack of any compensatory mitigation to offset the adverse effect do not support the FWCA's requirement to provide for the improvement of the fish and wildlife resources.

Endangered Species Act

The ESA requires federal agencies (in this case, the District) to ensure, in consultation with us, that any action authorized, funded, or carried out by them is not likely to jeopardize species listed under the ESA or destroy or adversely modify critical habitat. An interagency consultation, pursuant to Section 7 of the ESA, for the proposed project is necessary, and has been started by the District. It is important to note that in the regulations implementing Section 7(a)(2) of the ESA (interagency consultation), "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur.

National Environmental Policy Act (NEPA)

Project Purpose and Need

The DSPC's stated project purpose is to "modernize the State of Delaware's international waterborne trade capabilities, allow for the State of Delaware port to remain competitive within the Delaware River international trade market, meet the rising demand for modern containerized ports, and to continue, and strengthen, waterborne trade's importance to the State of Delaware and regional economy." In the application materials, DSPC states that the construction of the marine terminal is in response to demonstrated need for expanded port capacity at the Port of Wilmington and in the Delaware River. This need for the new proposed port is stated to be driven by vessel capacity constraints and cargo handling constraints at the current Port of Wilmington. All of these statements base the purpose and need on a very small geographic area of the Delaware River and do not consider the broader context of numerous port facilities and existing and potential future capacity in the Delaware River including the 11 other port facilities on the river (Philadelphia, Camden, Paulsboro, Marcus Hook, Gloucester Marine Terminals, Penn Terminals and others) or the Northeast U.S. more broadly (e.g., Port of Virginia-Norfolk area, Maryland Port Authority-Baltimore, New York-New Jersey, Boston). In addition, many of the statements regarding project need, lack of capacity, and cargo estimates in the application materials are not supported by references or documentation and are overly broad.

Alternatives

The DSCP's purpose and need statement appears overly narrow and unnecessarily limits the evaluation of alternatives to the Port of Wilmington. This precludes the consideration of other practicable alternate locations that may be less environmentally damaging than port development. There are numerous other port facilities on the Delaware River and within the Mid-Atlantic region that are potential practical alternatives to DSCP's proposal, but they do not appear to have been considered. A more robust alternatives analysis is needed before any conclusion regarding the lack of practical alternatives to the DSPC's proposal should be made. This analysis should consider potential alternate locations within the Delaware River and larger Mid-Atlantic region and include additional information on the criteria developed to select and to evaluate alternatives, alternate sites considered and the rationale for the rejection of alternate sites. Rehabilitation or upgrades to existing facilities, as well as increases in efficiencies (i.e., modernization) at existing facilities should also be considered and fully analyzed as well. This more thorough analysis of alternatives which could avoid or minimize adverse effects to aquatic resources is consistent with the requirements of NEPA, the Clean Water Act (CWA) Section 404 (b)(1) Guidelines and aquatic resource conservation mandates under the FWCA and MSA.

As we have discussed above, should this project move forward in the DA permitting process, we recommend that the District require the preparation of an EIS to allow for a full and complete evaluation of the effects of the project, as well as alternatives including the "no action" alternative. In general, federal agencies prepare an EIS if a proposed major federal action is determined to significantly affect the quality of the human environment. A large-scale port facility such as this, which will have far reaching and long-term ecological impacts, appears to meet this standard of having sufficient impacts on the human environment to warrant being considered a major federal action requiring an EIS. These impacts to the human environment include:

- the alteration and degradation of approximately 100 acres of the Delaware River through dredging, filling and wharf construction;
- the increase loss of early life stages of commercially, recreationally, and ecologically important fish species due to impingement and entrainment in water drawn through vessel propellers, during the intake of ballast water, and by the operation of the anti-sedimentation fans;
- mortality of juvenile and adult fish, including listed sturgeon, as a consequence of

interaction with vessels and their propellers;
- water quality and benthic community degradation due to increased turbidity and bottom disturbance caused by vessel operation, maintenance dredging, and anti-sedimentation fans;
- potential long-term impacts to Cherry Island Flats, highly valued recreational fishing area and an important habitat for federally listed Atlantic sturgeon and shortnose sturgeon;
- the increased likelihood of vessel strikes and other environmental effects (air quality, traffic, vessel strikes of vessel and vehicle traffic to and from the site to move goods offsite; and increase impervious cover as the upland portion of the site.
- potential cumulative effects resulting from the construction and operation of the proposed facility in combination with the existing and proposed ports on the Delaware, as well as the numerous industrial intakes**.**

Aquatic Resources

The mainstem Delaware River has been designated EFH for a variety of fish managed by the New England Fishery Management Council and Mid-Atlantic Fishery Management Council because these areas provide feeding, resting, nursery, and staging habitat for a variety of commercially, recreationally, and ecologically important species. Various life stages of species for which EFH has been designated in the area of the proposed project include, but are not limited to bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), winter skate (*Leucoraja ocellata*), and windowpane flounder (*Scophthalmus aquosu*s). The Delaware River, including the areas in and around the proposed project site, also serves as important migratory, nursery, resting, foraging, and potentially spawning habitat for anadromous fish such as alewife, blueback herring, American shad, and striped bass. Other aquatic resources and their forage which are of concern to us include, but are not limited to, blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), American eel (*Anguilla rostrata*), bay anchovy (*Anchoa mitchilli*), hickory shad (*Alosa mediocris*), Atlantic croaker (*Micropogonias undulatus*), weakfish (*Cynoscion regalis*), and other assorted baitfishes and shrimps, which can be found in the Delaware River and vicinity of the project area. Early and recent studies have also confirmed that the federally listed Atlantic sturgeon and shortnose sturgeon use the lower tidal river and Cherry Island flats extensively.

River Herring and American Shad

The Delaware River is one of the most important river systems for alewife, blueback herring, and American shad on the East Coast, due in part to its landscape position, large associated estuary and bay with marshes, creeks and tidal flats, lack of significant obstructions/dams, and history of effective multi-state fisheries management. These *Alosa* species have complex lifecycles where individuals spend most of their lives at sea then migrate great distances to return to freshwater rivers to spawn. American shad (stocks north of Cape Hatteras, N.C.), alewife, and blueback herring are believed to be repeat spawners, generally returning to their natal rivers to spawn (Collette and Klein-MacPhee 2002).

American shad, blueback herring, and alewife formerly supported the largest and most important commercial and recreational fisheries throughout their range; fishing spanned rivers (both freshwater and saltwater), estuaries, tributaries, and the ocean; and commercial landings for these species have declined dramatically from historic highs (ASMFC 2018; 2020). The most recent benchmark stock assessment and peer review completed in 2020 indicate American shad remains depleted coastwide. The “depleted” determination is used instead of “overfished” to indicate factors besides fishing have contributed to the decline, such as channelization of rivers, water withdrawals, habitat degradation, and pollution. Coastwide adult mortality is unknown, but was determined to be unsustainable for some system-specific stocks, indicating the continued need for management action to reduce adult mortality. Specifically, adult mortality was determined to be unsustainable in the Delaware River system (ASMFC 2020).

The 2020 benchmark stock assessment continued work from the 2007 coastwide stock assessment for American shad, which also identified stocks as highly depressed from historical levels. The 2007 assessment concluded that new protection and restoration actions needed to be identified and applied, which led to the development of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management). Amendment 3 identified significant threats to American shad, including spawning and nursery habitat degradation or blocked access to habitat, resulting from dam construction, increased erosion and sedimentation, and losses of wetland buffers (ASMFC 2007). Protecting, restoring and enhancing American shad habitat, including spawning, nursery, rearing, production, and migration areas, are necessary for preventing further declines in American shad abundance, and restoring healthy, self-sustaining, robust, and productive American shad stocks to levels that will support the desired ecological, social, and economic functions and values of a restored Atlantic Coast American shad population (ASMFC 2010). A number of long-term surveys discussed below have documented the use of the proposed project site by American shad, as well as alewife and blueback herring.

In the Mid-Atlantic, landings of alewife and blueback herring, collectively known as river herring, have declined dramatically since the mid-1960s and have remained very low in recent years (ASMFC 2017). The 2012 river herring benchmark stock assessment found that of the 52 stocks of alewife and blueback herring assessed, 23 were depleted relative to historic levels, one was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short (ASMFC 2012a). The 2017 stock assessment update indicates that river herring remain depleted at near historic lows on a coast wide basis. The “depleted” determination was used in 2012 and 2017 instead of “overfished” to indicate factors besides fishing have contributed to the decline, including habitat loss, habitat degradation and modification (including decreased water quality), and climate change (ASMFC 2017).

Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in alewife and blueback herring populations throughout much of their range since the mid-1960s, river herring have been designated as Species of Concern by NOAA. Species of Concern are those about which we have concerns regarding their status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA. We strive to draw proactive attention and conservation action to these species.

These Alosine fishes are important forage for several federally managed species and provide trophic linkages between inshore and offshore systems. Buckel and Conover (1997) in Fahay et al. (1999) reports that diet items of juvenile bluefish include these species. Additionally, juvenile *Alosa* species have all been identified as prey species for summer flounder, winter skate, and windowpane flounder, in Steimle et al. (2000). The EFH final rule states that prey species are an important component of EFH and that loss of prey may be an adverse effect on EFH and managed species. As a result, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH.

Striped Bass

The project area is also regionally and nationally significant for striped bass because of its importance as migration, spawning, nursery, foraging, and resting habitat. This is due in part to the presence and proximity of Cherry Island Flats, the shallow flat, bar area located offshore of the project site. Numerous studies have documented that this entire section of the Delaware River is disproportionately important for all life stages of striped bass, as spawning, growth rates, and subsequent contribution to the Atlantic stock are high (Weisberg et al. 1996; Wainright et al. 1996; Greene and Crecelius 2006; DNREC 16-foot Trawl data 1980-present; DNREC Personal Communication). Additionally, this section of the Delaware River is a highly valued recreational fishing site due to the complex interactions of biotic and abiotic elements that result in high striped bass occupancy and overall productivity.

Atlantic striped bass have formed the basis of one of the most important and valuable commercial and recreational fisheries on the Atlantic coast for centuries; the fishery is also strongly tied to the cultural heritage of the eastern U.S (ASMFC 1981). The spawning population of the Delaware River system contributes significantly to the coastal migratory stock (ASMFC 2003). However, overfishing and poor environmental conditions lead to the collapse of the fishery in the 1970s and 80s and development of the Striped Bass Fishery Management Plan (FMP) in 1981 (ASMFC 2003). After years of increasing numbers following implementation of the FMP, commercial and recreational landings of striped bass as well as female spawning stock biomass and recruitment, have declined since their peak in the early- to mid-2000s (ASMFC 2019). Most recently, the 2018 Atlantic Striped Bass Benchmark Stock Assessment found the resource overfished and that overfishing is occurring (ASMFC 2019). The 2018 benchmark assessment, which used updated recreational catch estimates, found the stock to have been overfished since 2013 and experiencing overfishing, and as a result, initiated efforts to end overfishing including catch and size limits. Additionally, female spawning stock biomass (SSB) in 2017 was estimated to be nearly 50 million pounds below the SSB threshold of 202 million pounds and nearly 100 million pounds below the SSB target (ASMFC 2019). Accelerated declines in striped bass populations may result from the cumulative and synergistic effects of overfishing and non-fishing related activities that impact reproduction, recruitment and survival.

Mature female striped bass (age six and older) produce large quantities of eggs, which are fertilized by mature males (age two and older) as they are released into riverine spawning areas, including the Delaware River. While developing, the fertilized eggs drift with the downstream currents and eventually hatch into larvae (ASMFC 1981). Late larvae and early juveniles favor shallower water with slower currents, and likely reside in nearshore areas for increased feeding opportunities and reduced predation risk. Boynton et al. (1981) reported that approximately five times as many juvenile striped bass were collected in the nearshore habitat of the Potomac River Estuary than in the offshore habitat, which also suggests that the former habitat is preferred, as appears to be the case in other estuaries (Chadwick 1964; Setzler et al. 1980). Juveniles overwinter in the lower Delaware River and upper Delaware Bay (Weisberg et al. 1996). Juvenile striped bass remain in coastal nursery estuarine and riverine habitat for two to four years and then join the coastal migratory population in the Atlantic Ocean. In the ocean, fish tend to move north during the summer and south during the winter. Important wintering grounds for the mixed stocks are located from offshore New Jersey to North Carolina. With warming water temperatures in the spring, resident and coastal contingents move upriver to the freshwater reaches of coastal rivers, including the Delaware and its tributaries, to complete their life cycle.

American Eel

The area of the proposed project is also migration, spawning, nursery, and foraging habitat for the American eel. Catadromous American eels spawn in the Sargasso Sea and transit the Delaware River up to the freshwater reaches of the main stem and its tributaries as part of their migration. They inhabit these upstream freshwater areas until they return to the sea as adults. According to the 2012 benchmark stock assessment, the American eel population is depleted in U.S. waters. The stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, exposure to toxins and contaminants, and disease (ASMFC 2012b). Actions being considered as part of the proposed project may impede the movements of these species between important freshwater habitats and the Atlantic Ocean in a number of ways including altering hydrologic conditions such as velocity and flow patterns, as well as changing water quality.

Habitat Characterization and Project-Specific Surveys/Sampling

We have a number of significant concerns about the DSPC's habitat characterization, data collection and surveys, and their conclusions regarding project effects which appear to be based upon flawed and incomplete data. As mentioned above, DSPC's consultant contacted our Habitat Conservation Division staff directly for recommendations concerning aquatic resource surveys at the site. However, it appears that the extensive comments we provided were, to a large extent, disregarded by the consultant in the design and implementation of their aquatic resource sampling plan. In addition, a number of robust and long-term surveys appear to have been disregarded during the DSPC's analysis of effects.

Numerous surveys have been conducted and continue to be conducted in the Delaware River in and near the project area. Several of these studies, including those used by ASFMC to understand fish population trends were highlighted in the EFH assessment, but the results of the surveys appear to have been misinterpreted or largely disregarded in DSCP's analysis of effects. When the data were considered in the EFH assessment, DSCP did not distinguish between the different life stages of fish, completely omitting information on egg, larvae, and juvenile stages found within the project vicinity. This omission was carried through to the analysis of effects. As a result, the DSPC's conclusion, which has been accepted by the District that "a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas" and that "no habitat of value was identified within the affected environments" is not supported by the data or existing literature, and is directly contradicted by numerous studies and by the DSPC's own project-specific data.

Existing Fisheries Studies

The New Jersey Department of Environmental Protection (NJDEP) Division of Fish and Wildlife conducts several surveys each year to study the status of species populations within the Delaware River and Estuary. One of these surveys is the Delaware River Seine Survey, which has been conducted in portions of the river near the project area since 1980. It is currently the Bureau of Marine Fisheries' longest running fishery-independent survey and the data provides an annual abundance index for striped bass. Results have been corroborated by other independent surveys, such as the Delaware Division of Fish & Wildlife's (DFW) striped bass spawning stock survey and other Delaware state surveys. The NJDEP long-term survey documents the use of this section of the river by a wide variety of species including striped bass, blueback herring, alewife, American shad, American eel, Atlantic herring, Atlantic menhaden, bay anchovy, gizzard shad (*Dorosoma cepedianum*), hogchoker (*Trinectes maculatus*), yellow perch (*Perca flavescens*), white perch (*Morone americana*), Atlantic silverside (*Menidia menidia*), and many others (NJDEP 2020).

Additionally, Weisberg et al. (1996) captured more than 25 different species near the area of the proposed project in the Delaware River including yellow perch, hickory shad, hogchoker, banded killifish (*Fundulus diaphanus*) and mummichog (*Fundulus heteroclitus*). Impingement studies done at the Eddystone Generating Station, located on the Pennsylvania side of the Delaware River near the project site, identified 53 species of fish in this section of the river including alewife, American eel, American shad, Atlantic menhaden, bay anchovy, blueback herring, gizzard shad, hogchoker, spot (*Leiostomus xanthurus*), striped bass and white perch (Waterfield et al. 2008).

DFW's 16-foot trawl survey data also show that a diverse fish community exists in the area of the proposed project. This survey, which has been consistently conducted since 1980, is primarily used to monitor juvenile fish abundance and is conducted monthly from April through October at 39 fixed stations in the Delaware Estuary. Although two DFW trawl survey stations nearest the site of the proposed project provide some insight into the species using the area, specifically juveniles, the time-series data from additional stations up and downstream of the proposed project have also contributed to our understanding that the Delaware Bay, Estuary, and River is an important, productive, and highly valued area for commercially, recreationally, and ecologically important species.

The two DFW trawl stations nearest the site of the proposed project indicate that a strong juvenile fish community consisting of alewife, American eel, American shad, Atlantic croaker, Atlantic herring (*Clupea harengus*), Atlantic menhaden, Atlantic sturgeon, bay anchovy, black drum (*Pogonias cromis*), black sea bass, blue crab, blueback herring, bluefish, bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), crevalle jack (*Caranx hippos*), eastern silvery minnow (*Hybognathus regius*), gizzard shad, hickory shad, hogchoker, naked goby (*Gobiosoma bosci*), northern hog sucker (*Hypentelium nigricans*), northern kingfish (*Menticirrhus saxatilis*), northern pipefish (*Syngnathus fuscus*), pumpkinseed (*Lepomis gibbosus*), shortnose sturgeon, silver perch

(*Bairdiella chrysoura*), spot, spottail shiner (*Notropis hudsonius*), spotted hake (*Urophycis regia*), striped anchovy (*Anchoa hepsetus*), striped bass, striped searobin (*Prionotus evolans*), summer flounder, tessellated darter (*Etheostoma olmstedi*), weakfish, white catfish (*Ameiurus catus*), white perch, yellow bullhead (*Ameiurus natalis*), and yellow perch exists at the site. Alewife, American eel, Atlantic croaker, bay anchovy, blue crab, channel catfish, hogchoker, striped bass, weakfish, and white perch dominated DFWs captures. Moderate numbers of American shad, Atlantic menhaden, blueback herring, and spot were also encountered (DFW 2020).

Striped bass appeared regularly in large numbers during the time-series, with the highest frequency of encounters generally occurring from June to August. Striped bass were encountered every month of the trawl from April to October. There is a strong shift in juvenile size classes of capture, with larger juvenile striped bass or sub-adults captured in April and May, and smaller fish, likely young-of-year, captured from June to October. Mean lengths of April and May captures hovered around 150 to 250 millimeters (mm), while captures between June and October ranged from 50 to 150 mm. Like striped bass, alewife were encountered during each month of sampling, but with a pronounced increase in captures occurring from July to October. Alewife size classes also follow a similar trend: larger juveniles were captured in April and May (mean approximately 80 mm), and smaller juveniles were captured from June to October (mean approximately 60 mm). American shad capture trends were similar to alewife (high captures from July to October), while American eel captures were similar to striped bass (high captures from June to September). Blueback herring followed a unique pattern with high captures in April, May and October. Length of captures for American shad and blueback herring generally followed the pattern for striped bass and alewife, with larger individuals captured in April and May. American eel lengths were generally consistent across the sampling months (DFW 2020).

One of the most notable and comprehensive surveys conducted in the vicinity of the project area, 0.9 river mile downstream at RM 72.3, was the 1999-2001 Clean Water Act 316(b) evaluation for the Edge Moor Power Plant (EMPP; ENTRIX 2002) in support of the facility's National Pollutant Discharge Elimination System permit. Seasonality and life stages found near and adjacent to the facility were captured through finfish pelagic and bottom trawls, ichthyoplankton nearfield and farfield tows, entrainment, and impingement sampling. Additionally, several representative important species (RIS) were highlighted as part of the impact assessment as indicators of an adverse environmental impact to the ecosystem. RIS were chosen by having one or more life stages vulnerable/susceptible to impingement and entrainment, were commercially or recreationally important or valuable species, and/or for their representation as an important linkage or position in the food web. RIS included river herring, bay anchovy, white perch, striped bass, weakfish, Atlantic croaker, and blue crab. Based on their importance to the Delaware Estuary, the assumption was given that these representative species protect other aquatic resources and changes in their abundance and distribution could alter the estuarine ecosystem (Versar 1993; Limburg et al., 1984; EPA 1977).

The following presents a high-level summary of the sampling results presented by ENTRIX (2002):

- Atlantic croaker, bay anchovy, hogchoker, white perch, and channel catfish comprised the top five species collected during the finfish trawls, which included 34 species or taxonomic groups in 2000 and 31 species or taxonomic groups in 2001. Peak trawl densities were observed from mid- to late-summer through late fall in both years.

- Both nearfield and farfield ichthyoplankton tows identified striped bass (the majority larvae) as the most abundant species collected followed by river herring and white perch. Ichthyoplankton were also present during each month of the farfield samples were collected (i.e., March through September), with the highest density recorded in May of each year. Between 21-24 species or taxonomic groups were collected through the nearfield surveys and between 30-34 species or taxonomic groups were collected through the farfield surveys.
- River herring and striped bass accounted for the majority of the entertainment catch with Atlantic croaker as the most abundant juvenile fish collected. Entrainment average monthly densities exhibited a peak in May of both study years and an average of 18 species or taxonomic groups were collected over the sampling events.
- Atlantic croaker, bay anchovy, river herring, white perch, striped bass, and weakfish were the 5 most abundant taxonomic groups collected during the impingement study, with Atlantic croaker as the most abundant species. The juvenile stage was the predominant life stage impinged for all of the RIS. Striped bass had the highest percentage of adults impinged of the RIS. Between 34-38 species or taxonomic groups were collected.

Echoing previous surveys discussed above and including the literature review presented in the EFH assessment, fish sampling performed in the vicinity of the project site has indicated the high productivity of this section of the Delaware Estuary, most notably dominated by striped bass and river herring. The July 29, 2019, bottom trawl conducted by the DSPC's consultant actually confirms the data from previous studies with the top three species (i.e., Atlantic croaker, white perch, and bay anchovy) mimicking captures between 1999-2001 in the ENTRIX study (2002). The abundance, productivity, variety, and life stages of the resources found throughout the ENTRIX (2002) survey demonstrates the value of the habitat at the site and in this section of the Delaware estuary. This further contradicts the EFH assessment conclusions, which determined a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas. As stated above, unfortunately, this inaccurate conclusion was carried through to the analysis of effects rendering it inaccurate and incomplete. In addition to numerous issues previously stated, the analysis failed to include any potential impacts to ichthyoplankton, which were omitted from the EFH assessment entirely. The EFH assessment also failed to include or discuss the ENTRIX (2002) study, which is concerning due to its proximity to the current project and the rigorous, multi-year and multi-season data that were collected.

DSPC's Fish Sampling

Site- and project-specific sampling was conducted by DSPC's consultant to identify benthic and aquatic resources within the project area that may be impacted as a result of the proposed project. The sampling plan included a single beach seining event (October 11, 2019), a single bottom trawl sampling event (July 29, 2019), and two benthic faunal/sediment and submerged aquatic vegetation sampling events (August 1, 2019 and October 11, 2019). As stated previously, our Habitat Conservation Division was contacted by the project consultant to provide informal comments on this benthic and fisheries survey plan. We provided comments on June 28, 2019, which echoed sentiments made in our February 28, 2019, scoping response to comments and raised concerns that the sampling design was inadequate and would likely result in sampling bias, limited statistical power of results, and an incomplete picture of biological communities, abiotic conditions, and potential impacts of the proposed project. As such, we recommended more frequent sampling across numerous seasons and additional methods which would cover the variations in aquatic organism presence and better represent the different life stages of species using the site. From the information provided, it appears our comments were not addressed, and the sampling that took place (and data collected) is inadequate for making any broad conclusions about the site or river system.

Despite the inadequacies of the DSPC's sampling, the results are generally consistent with expected seasonal detections and the decades of other data from in and near the project site from multiple sources including those mentioned above. Numerous individuals from fourteen species were captured during DSPC's trawl sampling on July 29, 2019 (though the project narrative indicates fifteen species were captured), and include American eel, hogchoker, blue crab, Atlantic croaker, weakfish, white perch, channel catfish, bay anchovy, naked goby, silver perch, striped bass, sand shrimp (*Crangon septemspinosa*), grass shrimp (*Palaemonetes paludosus*), and tessellated darter. These results are consistent with previous studies and do not support DSPC's contention that aquatic resources are not present on the site.

In the information provided to us, although species captures were reported, there was no indication of the number of individuals caught. This complicates our review of the results presented to us. However, based on the narrative that one (1) American eel was captured, which made up 1% of trawl #2 and 0.2% of all samples, we can extrapolate that approximately 500 fish were caught during the single day of sampling. Using percentages presented in the EFH assessment, we estimate captures to have been about 230 Atlantic croaker, 99 white perch, 83 bay anchovy, 35 sand shrimp, 15 grass shrimp, 11 blue crab, 5 channel catfish, 6 striped bass, 3 silver perch, 3 weakfish, 3 hogchoker, 2 tessellated darter, 1 American eel, and 1 naked goby. Photos 11 and 12 presented in Appendix 6 show mostly smaller fish, including young-of-year Atlantic croaker.

Fifty individuals of three species were captured during beach seining on October 11, 2019. These included 34 bay anchovy, 9 white perch, and 7 striped bass. Regarding beach seine fisheries sampling, it appears the final seine site locations were not reported, as only the "proposed locations" are displayed on maps and figures. If these locations were used, as shown in Figure 4 of the EFH assessment, it appears that seining took place in areas of the proposed fill/bulkhead locations and in depths above the MLW line.

Because numerous factors can influence seine sampling captures/detections, such as seine locations and the depth where the net is set, the actual seining locations, depth of water samples, and the depth of the seine net should have been reported in the results and methodology section of the EFH assessment, as opposed to referencing other reports. It is possible to target the species captured using a beach (haul) seine depending on the depth/size of the net and the depth at which the net is set, which may explain, along with the extremely limited amount of sampling days/events, the absence of Alosines in the data. To catch young of the year alosines, areas of deep water are typically targeted. If set in shallow water, captures will generally consist of white perch, panfish, minnow/shiners, bay anchovies, and killifish in this area of the river. Additionally, season, time of day, water temperature, and numerous other variables will influence captures/detections.

Habitat Characterization and Benthic Fauna

The habitat within the affected area was described in the EFH assessment as a mixture of estuarine, subtidal, and intertidal areas with water depths between 0-45 ft. MLLW. Salinities were described as varying by season (i.e., more freshwater in the spring to oligohaline in the summer and fall) and bottom substrate was described as sand and gravel, with some concrete rubble in the shallower designated construction area and fine-grained sediments (i.e., silt and clay) in the dredging area. Lacking from the documents provided to us is an adequate discussion of bottom relief and potential hard bottom features and/or structures within the project area, which provide valuable habitats for fish. The PN provided some additional information indicating a sub-tidal shelf extending water-ward from the low tide line to approximately -10 ft. LLW. However, indication of this shelf was not represented or discussed in the EFH assessment.

Appropriate habitat mapping generally includes an analysis of acoustic data (including multibeam echosounder bathymetry, backscatter, and side scan sonar) combined with substrate/benthic sampling in the form of benthic grabs, sediment profile and plan view (SPI/PV) imagery, video transects, and/or still imagery. Although static bathymetry and side-scan sonar figures are provided in the PN plans, there is no dynamic data provided for review, no discussion or indication of the density (i.e., resolution) of the data, or how the data were used in concert with other methods to accurately characterize and delineate habitat. Without this site-specific information, the effects of the proposed project cannot be fully evaluated.

The EFH assessment discussed broad patterns related to benthic faunal (i.e., benthic macrobenthos) species richness and abundance in estuaries, by primarily citing Montagna and Palmer (2014) and Uwadiae (2009). Unfortunately, these patterns were not placed in the proper context of the project-specific sampling or related to “expected” versus “observed” outcomes of the sampling. Furthermore, the benthic samples and species/families detected were not compared to other comprehensively collected data from the system, such as work done by Kreeger et al. (2011), nor were detection probabilities, capture rates, or other variables influencing species occupancy and sampling/detection (MacKenzie et al. 2004; MacKenzie et al. 2017) discussed in the documents provided.

The project-specific benthic data collected at the site, which appears to include detection of seven organisms from 3 phyla and 6 orders (Annelida-oligochaeta; Annelida-polychaeta; Arthropoda-isopoda; Arthropoda-amphipoda; Arthropoda-diptera; Mollusca-bivalvia), closely follows the general estuarine patterns of species richness, is comparable to recent studies in the area (Kreeger et al. 2011; PDE 2017), and is generally expected for this section of the river. In fact, these expected results are supported by conclusions that salinity was the dominant factor correlated with benthic community structure in the Delaware River-Estuary system (Kreeger et al. 2011; PDE 2017). To date, the Kreeger et al. (2011) data represents the most intensive and comprehensive assessment of the Delaware Estuary’s benthic fauna ever conducted, so comparing the project-specific data to this data should have occurred in the EFH assessment.

As we advised DSPC's consultant in our comments to them on their sampling proposal, when the goal of biological-ecological sampling is to fully capture and assess species composition and community structure over large spatial scales, multi-method, multi-event, multi-season, and multi-year sampling approaches are necessary. Sampling designed to characterize large areas of habitats or systems, where sampling takes place over very limited periods (such as single-digit days or during single seasons) is inadequate to make site-specific or broader system conclusions about species use, occupancy, or ecosystem function. Single day sampling can only provide an extremely limited snapshot into species occupancy on the day, during the specific time-frame, and in the specific area of the samples. Therefore, the project-specific sampling approach used by DSCP is not sufficient to draw any meaningful conclusions about the site or ecosystem or capture seasonal or environmental variability (e.g., water temperature, salinity), which influences species distributions and abundances. This limited sampling also omits specific timing of the occurrence of different life stages of species. As a result, based on the information provided, the sampling alone that has taken place (and data collected) is also not sufficient to make any conclusions about the site and potential impacts resulting from the project.

Although the extremely limited sampling is inadequate for drawing the broad conclusions the District and DSPC have made about the potential impacts at the site of the proposed project, the data appears to be consistent with existing species occupancy and detection data. In fact, the project-specific sampling confirms that the area is used by numerous fish and invertebrate species, and is therefore valuable habitat for various aquatic resources under our purview. When placed in the context of species accumulation curves (Ugland et al. 2013) and the available existing data, the single day (two days for benthic fauna) project-specific sampling strongly and directly contradicts the conclusions made by the District and DSPC that there is a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas and that no habitat of value is present the project area.

Analysis of Effects

Because the District and DSPC has inaccurately concluded that the proposed project area virtually has no aquatic resources and no habitat of value, the analysis of effects is based upon inaccurate and incomplete information and greatly understates the substantial and unacceptable impacts that the proposed project will have on aquatic resources of national importance including the many species identified at the site. These adverse effects will result from fill, pile placement, wharf construction, dredging, installation of sedimentation fans, vessel traffic and propeller wash, and ballast water intake associated with this project. We also understand that significant contamination exists on the site and that remediation activities are being overseen by the Delaware Department of Natural Resources. Should this application continue to move forward in the permitting process, a fully and complete analysis of all of the direct, indirect, individual, cumulative, and synergist effects of the construction and operation of the proposed port should be undertaken and a revised and complete EFH assessment should be provided to allow for an expanded EFH consultation. This analysis should be based upon detailed habitat mapping of the project site and the biological information found in the many available sources including those discussed above and the available literature. It should also include information of the nature and scope of contamination and the potential for contaminant release and aquatic resource exposure.

Because the lack of appropriate and comprehensive analyses is so wide-ranging, we will not discuss each element individually. We will highlight some of the activities with the most significant adverse effects that should be evaluated by the District and considerations to include in that evaluation. In all cases, the direct and indirect physical, chemical, and biological alterations of the waters and substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions should be comprehensively addressed. Actions should be broken down into their components and subcomponents and related directly to the stressors generated from each, exposure of habitats and species to the stressors, and resulting responses, or effects (known as the stressor-exposure-response framework). From there, the effects to habitats and species should be identified, described, and analyzed in the context of short-, medium-, and long-term temporary and permanent/chronic impacts at the site, river, and regional level. Analysis of individual, synergistic, and cumulative effects should also be undertaken.

Habitat Loss and Conversion

The placement of the proposed bulkhead waterward of the existing shoreline will result in the permanent loss of 5.5 acres of the Delaware River including shallow areas important for juvenile fishes and bait fishes. This permanently filled area will no longer provide foraging, resting, migration, sheltering, spawning or any habitat for species and will add vertical wall structures into the aquatic environment that will permanently and completely disconnect the aquatic environment from any natural shoreline. This will adversely impact system wide primary and secondary production and overall energy flow-food web support, nutrient cycling, and other ecosystem processes. Additionally, the placement of the vertical man-made wall structures will lead to a cascade of permanent and chronic adverse impacts, including increased wave energy, scour, turbidity, and sedimentation, degradation and elimination of benthic habitat, decreased benthic faunal diversity, beach steepening, and others (USACE 1981; NOAA 2015; Gittman & Scyphers 2017; Dugan et al. 2018; and others). We are also concerned that there is a lack of information on the exact location of the bulkhead in the documents provided to us and little or no data on the specific habitat and features in this area that will be permanently eliminated. Additionally, DSCP appears to be seeking authorization to fill this area with contaminated material removed from the proposed area to be dredged.

The construction of the wharf structure and the associated piles and decking will also result in the permanent loss of 7.5 acres of aquatic habitat within the Delaware River. The proposed wharf will be supported by 4,500, 20-inch diameter, concrete-filled steel pipe piles. Due to the number and close placement of the pilings, we consider the wharf construction to be a loss of aquatic habitat. As stated in 33 CFR § 232.3(c)(1) (Discharge requiring permits -Pilings):

> Placement of pilings in waters of the United States constitutes a discharge of fill material and requires a section 404 permit when such placement has or would have the effect of a discharge of fill material. Examples of such activities that have the effect of a discharge of fill material include, but are not limited to, the following: Projects where the pilings are so closely spaced that sedimentation rates would be increased; projects in which the pilings themselves effectively would replace the bottom of a waterbody; projects

> involving the placement of pilings that would reduce the reach or impair the flow or circulation of waters of the United States; and projects involving the placement of pilings which would result in the adverse alteration or elimination of aquatic functions.

There are many studies that demonstrate that large pile supported structures degrade fish habitat. For example, studies on the effects of large pile-supported structures (Able et al. 1995) found that fishery habitat quality is poor under large pile-supported structures as compared to pile fields (piles with no deck or overwater component) and interpier areas. Also, diversity, abundance and growth rates of juvenile fishes were lower under large pile-supported structures than in pile fields and interpier areas (Able et al. 1998, Duffy-Anderson and Able 1999). It is likely that the adverse conditions begin at the point where the low light levels under the pier begin to impair the success of sight feeding fish including species such as yellow perch (Granqvist and Mattila 2004) and blueback herring (Janssen 1982 in Collette and Klein-MacPhee 2002). In addition to severely decreased light penetration, the area under the pier may also be subjected to increased turbidity and reduced water circulation. The decrease in water circulation can also adversely affect striped bass survival as strong current is needed to keep the eggs suspended in the water column and prevent them from being smothered by silt (Bigelow and Schroeder 1953).

Shading from over-water structures, including the proposed wharf, will also adversely affect EFH, federally managed species, their prey, and other aquatic resources under our purview by degrading habitat quality in, and near, the shadow cast by the structure and by altering behavior and predator-prey interactions (Nightingale and Simenstad 2001; Hanson et al. 2003). Under-structure light levels can fall below the threshold for photosynthesis for many primary producers, adversely affecting photosynthetic organisms, habitat complexity, and overall net primary production, and for large projects, adversely impact secondary and tertiary production (Kenworthy and Haunert 1991; Haas et al. 2002; Struck et al. 2004). In the aquatic environment, floating and emergent vegetation are adversely impacted by shading, as well as less conspicuous primary producers, such as benthic microalgae. Benthic microalgae are an important trophic resource, and aid in the stabilization of sediments, controlling scour and resuspension of bottom sediments (Wolfstein and Stal 2002). Furthermore, benthic microalgae are important components of nutrient cycling and exchange in the water column, and contribute significantly to the overall primary production of ecosystems (Stutes et al. 2006). Communities in shaded areas are generally less productive than unshaded areas; light limitation is detrimental to benthic microalgae primary production, sediment primary production and metabolism (e.g., soil respiration) (Whitney and Darley 1983; Meyercordt and Meyer-Reil 1999; Stutes et al. 2006). Shading impacts are considered permanent due to the long-term placement of structures (Hanson et al. 2003; Struck et al. 2004; Johnson et al. 2008).

Many aquatic species, primarily fish, rely on visual cues for spatial orientation, predator-prey interactions (e.g., prey capture and predator avoidance), migration, and other essential behaviors. Early life history stages of fish are primarily visual feeders that are highly susceptible to starvation - a primary cause of larval mortality in marine fish populations (May 1974; Hunter 1976). Juvenile and larval fish survival is likely a critical determining factor for recruitment, with survival linked to the ability to locate and capture prey, and to avoid predation (Seitz et al. 2006). The reduced-light conditions found under overwater structures limit the ability of fishes, especially juveniles and larvae, to perform these essential prey capture and predator avoidance activities. Total abundances of fish can be substantially reduced in areas shaded by piers (Southard et al. 2006; Able, Grothues & Kemp 2013; Munsch et al. 2017). Overall, it appears that overwater structures that create dark environments can reduce localized habitat value by impairing visual tasks (e.g., feeding, predator vigilance) and reducing prey availability and habitat connectivity by constraining movements (Munsch et al. 2017).

Reductions in sub- and intertidal benthic and primary productivity, may in turn adversely affect patterns of invertebrate abundance, diversity, and species composition (Nightingale and Simenstad 200l). Structures that attenuate light may also adversely affect food webs by reducing micro- and macro-phyte growth, soil organic carbon and by altering the density, diversity, and composition of benthic invertebrates that are prey for numerous fishery species (Alexander and Robinson 2006; Whitcraft and Levin 2007). Prey resource limitations affect movement patterns and the survival of many juvenile fish species (Seitz et al. 2006; Johnson et al. 2008). The shadow cast by a structure may also increase predation on species by creating a light-dark interface that allows ambush predators to remain in darkened areas and wait for prey to swim by against a bright background, resulting in high contrast and high visibility (Helfman 1981). Prey species moving around the structure may be unable to see predators in the dark area under the structure or have decreased predator reaction distances and times, thus making them more susceptible to predation (Helfman 1981; Bash et al. 2001). Decreased predator avoidance (and increased mortality from predation) may be particularly important at the site of the proposed project for shad and river herring as the Northern snakehead (*Channa argus*), a sit-and-wait invasive piscivore, now occurs in Delaware River system (USGS Nonindigenous Aquatic Species clustered specimen observation records). Northern snakeheads are voracious fish predators, representing a significant threat to shad and river herring through predation and to striped bass through competition for prey (Saylor et al. 2012; Philadelphia Water Department and DNREC personal communication 2019 and 2020).

American shad and river herring appear to be particularly susceptible to the shadow cast by overwater structures (Moser and Terra 1999). American shad tend to be diurnal in their migratory habits and tend to migrate primarily during the day, while falling back to lower-velocity zones at night; adults and juveniles use side-channel and shallower areas near shorelines at day and night (Fisher 1997; Haro and Kynard 1997; Theiss 1997; Sullivan 2004). American shad are reluctant to immediately pass under darkened areas of channels, specifically under low bridges or strong shadows, or where there is a strong light transition (Haro and Castro-Santos 2012). American shad school as both juveniles and adults and have a low likelihood of separating from a school in order to pass a structure or its shadow (Larinier and Travade 2002). River herring require light to form schools and are most active during the day and have difficulty avoiding obstacles at night (Blaxter and Parrish 1965; Blaxter and Batty 1985). Similarly, laboratory observations of alewives indicated that both juveniles and adults are most active during the day (Richkus and Winn 1979). Moser and Terra (1999) performed a field study to investigate low light as an impediment to river herring migrations and found significantly higher numbers of herring passed through unshaded treatments, as compared to shaded treatments. Fish often require visual cues for orientation and exhibit faster swimming speeds at increased light levels (Pavlov et al. 1972, Katz 1978).

The proposed dredging will result in the permanent conversion of shallow water habitat in the project area to deepwater habitat resulting in the loss of habitat for juvenile anadromous fish species. As stated above, Boynton et al. (1981) reported that approximately five times as many juvenile striped bass were collected in the nearshore habitat of the Potomac River Estuary than in the deeper, offshore habitat, highlighting the importance of shallow nearshore habitat. Other studies in other estuaries also support Boynton's result including Chadwick (1964) and Setzler et al. (1980). In addition, white perch are also ordinarily found in shallow water, usually not deeper than four meters (Beck 1995, Collette and Klein-MacPhee 2002.). Dredging also removes benthic organisms that many species rely on for prey; frequent repeated maintenance dredging events will likely prevent recolonization of the benthos by invertebrates and reduce site-wide productivity (Van Dolah et al. 1984; Wilber and Clarke 2001; 2010).

Turbidity and Sedimentation

Anthropogenic-induced elevated levels of turbidity and sedimentation, above background (e.g., natural) levels can lead to various adverse impacts on fish and their habitats. These increased levels can be caused by construction activities such as the dredging, pile driving, bulkhead installation, and filling proposed by DSPC, as well as the operation of the facility including vessel movements, changes in hydrodynamics due to the alteration of the river bottom from dredging, the pile installation and changes in shoreline alignment due to the bulkheading and fill in the river, as well as the operation of the anti-sedimentation fans.

Increases in turbidity due to the suspension or resuspension of sediments into the water column during activities such as dredging can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine- grained sediments (Johnson et al. 2008). Suspended sediment can also mask pheromones used by migratory fishes to reach their spawning grounds and impede their migration and can smother immobile benthic organisms and demersal newly-settle juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). Additionally, other effects from suspended sediments may include (a) lethal and non-lethal damage to body tissues, (b) physiological effects including changes in stress hormones or respiration, or (c) changes in behavior, reduced predator avoidance, and others (Wilber and Clarke 2001; Kjelland et al. 2015). Increases in turbidity will also adversely affect the ability of some species, such as larval striped bass, to locate and capture prey and evade predation, leading to decreased survivorship (Fay et al. 1983 in Able and Fahay 1998). Species with low foraging plasticity have been shown to experience high mortality compared with other species during acute elevated turbidity conditions (Sullivan and Watzin 2010). Turbidity can also decrease photosynthesis and primary production, resulting in reduced oxygen levels.

Elevated rates of sedimentation can lead to numerous negative effects to aquatic systems. These can include loss of habitat heterogeneity and reduction in organic matter retention and stable substrate (Allan 2004). Furthermore, the sedimentation (burying/covering) of individual organisms and habitats and changes in benthic environments via alteration to sediment quality, quantity, and changes in grain size can reduce species diversity and decrease overall ecosystem function (Thrush and Dayton 2002). The smothering of benthic prey organisms and chronic elevated sedimentation can prevent recolonization, which reduces the quality of the habitat by making it unsuitable for foraging (Wilber and Clarke 2001). Additionally, particle size is one of the main drivers of benthic faunal biodiversity and community composition; therefore, changes to sediment composition from sedimentation will affect the benthic prey resources of various species, including NOAA-trust resources (Wood and Armitage 1997; Wilber and Clarke 2001).

Limited discussions of turbidity and sedimentation are included in the document, but are generally discounted, though the justification for such discounting is absent. Additionally, the statement in the EFH assessment that "shoaling fans do not increase turbidity, but allow sediment to stay suspended within the water column rather than settling on the river bottom," is contradictory and misleading. Based on the simple but widely accepted, U.S. Geological Survey[1] definition, sediment suspended within the water column is a cause of turbidity. If sediment fans prevent sediment from settling out, they will cause elevated levels of turbidity in and around the site of the proposed project.

Noise

Noise from the construction activities, such as wharf and bulkhead construction, may also result in adverse effects to various fish species. Our concerns about noise effects come from an increased awareness that high-intensity sounds have the potential to adversely impact aquatic vertebrates (Fletcher and Busnel 1978; Kryter 1985; Popper 2003; Popper et al. 2004). Effects may include (a) lethal and non-lethal damage to body tissues including hearing/sensory structures, (b) physiological effects including changes in stress hormones, hearing capabilities, or sensing and navigation abilities, or (c) changes in behavior (Popper et al. 2004). More specifically, adverse non-lethal impacts of hearing loss in fish relate to reduced fitness through disrupted communication, reduced predation and feeding success, reduced prey detection, and/or inability to assess the environment or inability to move and migrate in desired or appropriate directions (Pooper et al. 2004). Additionally, anthropogenically generated sound may also lead to the masking of other biologically relevant sounds species use to carry out essential life functions, which could combine with hearing loss and other impacts to have additive effects on species and populations (Popper et al. 2004).

Impingment and Entrainment

<u>Dredging</u>

Impacts on benthic communities from dredging have been well-documented in numerous studies (e.g., Van Dolah et al. 1984; Clarke et al. 1993; Wilber and Clarke 2001; Wilber and Clarke 2010). However, dredging can also result in the impingement and entrainment of eggs, larvae and free swimming organisms, including diadromous fish, which can lead to injury and mortality (Thrush and Dayton 2002). This direct impact may be significant for various life stages of certain species: impingement and entrainment risk is generally low for juvenile and adult fish and higher for eggs and larvae. This pattern is not consistent in shellfish species such as crabs and shrimp, where all life stages are susceptible to impingement and entrainment; for example,

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[1] Turbidity is the measure of relative clarity of a liquid. It is an optical characteristic of water and is a measurement of the amount of light that is scattered by material in the water when a light is shined through the water sample. The higher the intensity of scattered light, the higher the turbidity. Material that causes water to be turbid include clay, silt, very tiny inorganic and organic matter, algae, dissolved colored organic compounds, and plankton and other microscopic organisms.

egg-bearing female blue crabs are at high risk for impingement and entrainment when buried in sediments during winter months and are too lethargic to avoid dredges (Reine and Clarke 1998; Wilber and Clarke 2001; Thrush and Dayton 2002). Impacts from impingement and entrainment to important prey species can reduce overall habitat quality by reducing availability of prey. For example, sand shrimp (*Crangon spp*), one of the dominant species in DSPCs fisheries sampling, are important prey for many estuarine organisms, including various life stages of species found in the project area. Armstrong et al. (1982) found sand shrimp were the most numerically abundant organism entrained by dredges during dredging studies in the Pacific Northwest. This study estimated entrainment rates for sand shrimp as high as 3.4 shrimp per cubic yard of material, and based on an annual shrimp population of 80 million, estimated that total loss to the population through entrainment during the course of a "typical" dredging project could range from 960,000 to 5,200,000 individuals, or 1.2% to 6.5% (Armstrong et al. 1982).

Shoaling Fans

We also wish to highlight one element of the proposed project in particular because of the potential for wide-ranging, chronic effects. Recognition and discussions of potential impacts associated with the shoaling fans is limited or has been discounted. This lack of analysis is concerning because the use of such fans is rather limited across the United States, impacts are not fully described or understood on the individual, population, community, or ecosystem level, large numbers of fans in series such as those proposed here are rare or absent, and the potential for impacts to commercial, recreational, and ecologically important area could be profound and wide-ranging both individually and cumulatively.

The shoaling fans are described in the documents provided and through SedCon Technology (fan manufacturer) website and technical documents as a system consisting of multiple water jets powered by hydraulic motors. Water is taken in through an intake screen up in the water column, moved downward through the unit by a hydraulic driven impeller (less than 500 revolutions per minute [rpm], but likely around 275 rpm), and discharged horizontally at the mud line. The fans are reported to provide a 4-inch screen at the larger intake end and an open space of 1.5 ft. between the blades. Capture velocities at the intake are reported by the manufacturer to be in the range of 2.5 ft./second at the screen and drop to about 0.5 ft./second approximately four ft. away. The documents and website also report that studies have been done on the probability of fish impact and that a two-inch fish has a 20% probability of impact if it is drawn into the unit. The run-time for each unit during a specific tide is approximately 30 minutes, four times per day. The "effective sedimentation prevention distance" covered by each unit is anticipated to be approximately 160 ft. channel-ward from the breasting line of the berth. Each fan would be secured by one 18-inch steel H Piling.

The two primary stressors associated with the fans appear to be impingement/entrainment and near constant agitation dredging and resulting turbidity and sedimentation, both of which will reduce habitat quality and lead to physical/mechanical injury and mortality to aquatic organisms, including fish. Included in the documents and manufacturer website are statements such as "most fish ...would easily be able to escape capture," however, there are no discussions of various life stages or swimming abilities of organisms, such as eggs and larvae (planktonic stages). Comprehensive analysis of the potential impacts of the shoaling fans should include examination of various egg types and the swimming capabilities (i.e., speeds) of various swimming life stages of fish and shellfish species found in the system in the stressor-exposure-response framework. Variable swimming speeds, typically associated with distinct swimming behaviors, should be included in the analysis as well as discussions of rheotaxis, influence of tidal phase, and physiological limitations of sustained escape, especially in the context of the proposed multiple series of fans. Analysis should include all species found in the area, as many species are important prey for federally managed species and diadromous fish.

Furthermore, within the limited discussion of fan impacts in the documents provided to us appears to be a flawed assumption that avoiding a single fan intake equates to total escape and survival (i.e., low risk or no impact). However, because the current project is proposing numerous fans in series, will drastically change the hydrology of the area through fill, pile placement, and dredging, and the presence of vessels will further change hydrology (while in-port) while at the same time introducing impingement/entrainment risk via ballast water intakes, these assumptions are not representative of the conditions, and therefore the potential impacts, of the proposed project. This should be addressed in all future analysis. Additionally, day-night comparisons should also be included in any analysis, as swimming performance and increased susceptibility to impingement and entrainment differ among species during the day-night cycle. The large amount of literature related to hydraulic dredging and water intakes related to impingement/entrainment are an appropriate starting point for the shoaling fan analysis and could dovetail with the limited information that exists on the shoaling fans themselves. However, because of the unique nature of these fans proposed in this important area for numerous species such as striped bass, laboratory/tank/mesocosm and field-based studies (or monitoring results of other projects) should be undertaken/provided to fully analyze the potential impacts of these devices over the operational life of the Port.

Ballast Water

Container vessels mooring at the facility will require the intake and discharge of ballast water as containers are unloaded and loaded. The intake of ballast water will entrain large numbers of fish eggs, larvae and other early life stages. We are particularly concerned about the impacts to the early life stages of river herring, American shad and striped bass. As discussed above, sampling done this year found young-of-year of all of these species within the proposed dredge footprint. Ballast capacity can range from several cubic meters in sailing boats and fishing boats to hundreds of thousands of cubic meters in large cargo carriers. Large tankers can carry in excess of 200,000 m3 of ballast with container vessels holding tens of thousands of cubic meters of ballast water (NAP 1996). Ballasting intake rates can be as high as 15,000 to 20,000 m3/h (NAP 1996). The project documents lack any mention of this significant effect on aquatic resources, nor is there any discussion of discharges into the Delaware River from the vessels mooring at the proposed facility.

Impacts to Cherry Island Flats

Though discussed in our scoping letter and mentioned in the EFH assessment, Cherry Island Flats, an important geomorphic feature within the Delaware River and adjacent to the site, is not identified on any plans or discussed in detail. Additionally, potential impacts to the Flats are not analyzed in any substantive way. The importance of this area has been discussed previously and is well-known; the Flats are a highly productive area for numerous species, including striped bass, and is one of the most popular recreational fishing areas in the Delaware River. Shortnose and Atlantic sturgeon have also been documented to use this area. We are concerned about potential impacts to the structure and function of Cherry Island Flats, which is in close proximity to the project area. The DSPC focuses all analysis of Cherry Island Flats on the total number of cubic yards of material to be dredged (as it relates to nearby projects), but does not address concerns over the proximity of the projects to the Flats.

Furthermore, there is no discussion or analysis of the impact of dredging, shoaling fans, increased vessel traffic, changes in hydrology, or other project elements that may impact the structure and function of the Cherry Island Flats. At present, it is unclear if biogeophysical processes that produce and maintain the Flats will persist following the large-scale alterations proposed here. Discussion of potential impacts to the Flats from permanent changes is entirely absent and modeling of any changes to biogeophysical processes in and around that flats has not occurred. We recommend this modeling and analysis be undertaken, and that a robust monitoring plan be developed for Cherry Island Flats for any proposed actions that may take place at the Edgemoor Site. Long-term monitoring and adaptive management should be included as part of any monitoring plan.

Cumulative Effects

The EFH assessment and other application materials do not adequately evaluate the cumulative effects of the proposed project. There is some mention of some projects proposed, underway, or completed within the Delaware River as part of the cumulative effects section of the various documents, but there does not appear to be any meaningful discussion. For many of the projects, DSPC simply states that they "do not overlap" with the current proposed project. However, cumulative impacts analyses are not restricted to spatial and temporal "overlap" of projects, as the DSPC documents suggest. Several small, medium, and large past, present, and future actions have not been considered. For example, large dredging (new and maintenance) and port projects are underway or have been proposed in the region such as those in/at the Navy Pier 4, Sunoco Refinery, Delaware City Refinery, Delaware River Federal Navigation Channel, Delaware River Partners Gibbstown Facilities, Salem [Nuclear] Power Plant, and several smaller port development projects are also proposed, underway, or completed in Philadelphia, Camden and Paulsboro areas.

Also concerning is the lack of discussion or analyses of the Edgemoor (Edge Moor) Energy Center located along the same shoreline, less than one thousand meters, from the proposed project site. Cumulatively, and in some cases such as the Hope Creek Wind Marshaling Port, these projects will have a substantial adverse effect on the aquatic environments of the Delaware River, Estuary, and Bay as well as NOAA-trust resources. A full assessment of the cumulative effects of the proposed project should be undertaken that includes the consideration of the cumulative effects of all past, present, and reasonably foreseeable future actions on aquatic resources. Some of the issues that should be addressed include the cumulative effects of the loss of aquatic water column/pelagic and benthic habitat on NOAA trust resources, loss of prey species, ballast water withdrawals, water discharges, vessel collisions and new dredging and future maintenance dredging needs.

Compensatory Mitigation

The DSPC has stated that the proposed project has been designed to avoid and minimize adverse effects on the aquatic environment to the maximum extent practicable and because the proposed activities would not cause the loss of wetlands or other special aquatic sites, compensatory mitigation is not necessary. We disagree with this conclusion. The *Final Rule on Compensatory Mitigation for the Losses of Aquatic Resources* (33 CFR 325 and 332 and 40 CFR 230) published in the Federal Register on April 10, 2008, does not limit compensatory mitigation only to impacts to wetlands and special aquatic sites. The rule refers to "waters of the United States." As stated in Part 332.1 (a)(1) of the rule, "the purpose of this part is to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the United States authorized through the issuance of DA permits pursuant to section 404 of the Clean Water Act (33 U.S.C. 1344) and/or sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401, 403)." These standards do not only apply to wetlands and special aquatic sites. They apply to all regulated waters of the U.S. including the Delaware River. In addition, because compensatory mitigation is intended to offset unavoidable impacts, it must first be demonstrated that the less damaging alternatives are not practicable and the impacts are unavoidable.

The Clean Water Act section 404(b)(1) guidelines outline the sequence to be followed prior to considering compensatory mitigation including the demonstration that potential impacts have been avoided and minimized to the maximum extent practicable. Because the analysis of effects was based upon flawed and misleading data, it does not evaluate fully the direct, indirect, individual, or cumulative effects of the proposed actions. Due to the lack of adequate purpose and need, robust alternatives analysis, and comprehensive analyses of the effects, it is not possible to evaluate the appropriateness of current avoidance and minimization measures. As a result, we cannot agree that avoidance and minimization has taken place and the remaining impacts are unavoidable.

Lastly, we have documented above that DSCP has not demonstrated that the project site lacks aquatic resources and habitat due to the omission of the extensive, existing fishery survey data available in and around the project site and the incorrect and misleading application of their own limited survey data. The existing available information demonstrates the opposite, that the site is habitat for a wide variety of aquatic resources including those of national importance.
Should this project move forward in the permitting process, compensatory mitigation for all unavoidable impacts to waters of the US should be provided. Additionally, because of the potential for significant adverse impacts to important species such as striped bass, river herring, and American shad, mitigation for losses in recruitment and overall production should be required. We recommend the District and DSPC engage with us and other federal agencies to discuss relevant mitigation.

EFH Conservation Recommendations

The EFH assessment provided to us is based upon incomplete and flawed data and does not evaluate the adverse effects of the project on EFH. As a result, it cannot be considered complete. Typically, in cases where the EFH assessment is not complete, we either withhold issuing EFH conservation recommendations until a complete assessment is provided, or we base our recommendations on the available information. The following EFH conservation recommendation pursuant to section 305(b)(4)(A) of the MSA:

- The construction of the proposed Edgemoor Port Facility should not be authorized unless, through the preparation of EIS or other publicly reviewed comprehensive NEPA document can demonstrate:
    - the justifiable project purpose and need,
    - that no alternate sites are available within the region,
    - that the impacts to aquatic resources have been avoided and minimized to the maximum extent practicable, and
    - that suitable compensatory mitigation can be provided that offsets fully all of the project's direct and indirect effects on aquatic resources and their habitats, including the effects on anadromous fishes and benthic and pelagic habitats.

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

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CRF 600.920(j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act

Atlantic sturgeon and shortnose sturgeon are known to be present year-round within the reach of the Delaware River where the construction and operation of a new terminal will occur. The river is also designated as critical habitat for the New York Bight distinct population segment of the Atlantic sturgeon. The reach provides important habitat and environmental conditions for juvenile Atlantic sturgeon foraging and physiological development, especially as it relates to juveniles' oceanward migration. Future vessels visiting the terminal will cross waters where federally listed sea turtles and whales as well as sturgeon may be present. You have determined that the proposed project may affect all the above species and is likely to adversely affect the two listed sturgeon species.

Conclusion

As currently proposed, this project will have a substantial and unacceptable impact on aquatic resources of national importance pursuant to Part IV, Paragraph 3(b) of the MOA due to the loss, alteration and degradation of important aquatic habitats in the Delaware River used by striped bass, American shad, alewife, blueback herring and other aquatic resources of national importance. We also note that the project document provided to us lacks a clearly defined purpose and need, a full and complete evaluation of alternatives, and does not address fully the individual, cumulative, direct and indirect effects of the construction and operation of the proposed project. Lastly, the lack of proposed compensatory mitigation is not only inadequate, but concerning for a project of this size and scale. Consequently, we must recommend that the permit for this project be denied in accordance with the MOA between our agencies. We also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project due to the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA).

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