CORRESPONDENCE

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

June 29, 2017

The Honorable Ryan Zinke
Secretary
Department of the Interior
1849 C Street, N.W.
Washington, DC 20240

The Honorable Wilbur L. Ross Jr.
Secretary
Department of Commerce
1401 Constitution Avenue N.W.
Washington, DC 20230

Dear Secretary Zinke and Secretary Ross:

Please accept these comments from the New England Fishery Management Council (Council) regarding the U.S. Departments of the Interior and Commerce joint review of National Marine Monuments. Specifically, we are commenting on the Northeast Canyons and Seamounts National Marine Monument, which was designated during September 2016 and overlaps five canyons and four seamounts in the New England region. We plan to submit these comments via regulations.gov in response to DOI's May 11 request for comments; we ask that you consider them a response to NOAA's June 26 request for comments as well.

The Council has management jurisdiction over 28 marine fishery species in federal waters of the New England region, and a number of these are harvested on southeastern Georges Bank in the shallower depths of the canyon section of the monument. We have thoroughly evaluated the overlap between the monument and commercial bottom-tending gear fisheries through our ongoing Deep-Sea Coral Amendment (see excerpts in Attachment 1). This analysis used vessel trip reports (logbooks) and satellite-based vessel monitoring system data on vessel location, combined with information from at-sea observers, to estimate revenue generated, species landed, and hours fished within the monument and other management areas under consideration.

The primary gear types used in and around the monument include bottom trawls, lobster pots, and scallop/clam dredges, with smaller amounts of effort from separator trawls and Ruhle trawls. Top species include lobster, Jonah crab, red crab, scallops, silver hake, longfin squid, butterfish, flounders, Atlantic mackerel, and haddock. Total annual fisheries revenue associated with the monument was estimated to be $1.8M for the period 2010-2015, based on logbook data. Based on information collected in a lobster permit holder survey conducted by the Atlantic States Marine Fisheries Commission, this total may underestimate revenue in the lobster pot fishery because of the way the data are collected. The results indicate that 12-14% of the offshore lobster fishery effort and 13-14% revenue ($2.4-2.8M annually) for the lobster and Jonah crab fishery comes from the area of the National Monument. We also assessed dependence of individual owners on the monument. While many vessel owners have a low percentage of their revenue or

effort attributed to the monument, others appear to be more dependent on the area, particularly those using fixed gears.

Our coral amendment process has demonstrated that:

- Council stakeholders with diverse backgrounds support the conservation of canyon and seamount habitats and the species within those habitats, in particular deep-sea corals, which are ecologically important and vulnerable to disturbance.
- Fish distributions and fishing activities in the canyons are strongly governed by depth. The spatial extent of a management area, particularly how shallow the area is, has a large influence on how much fishing effort will be displaced.

The two points above are strongly linked. Except for the red crab fishery, which is exclusively prosecuted below 600 meters, fishing effort in the monument occurs in shallower depths. Thus, in the context of the Council's coral amendment, fishery closures in deeper parts of the canyons (600 meters and greater) generally received broad support from stakeholders, provided that the Council authorizes an exemption for the red crab pot fishery. We have seen broad support for fishery closures on the seamounts as well, and there are no indications that bottom tending gears are used at present on or near the seamounts. Because depth changes rapidly in the canyons and along the slope, a distance of just a few kilometers at the surface can represent a large difference in depth, and thus have a substantial effect on the amount of fishing activity displaced by a fishery closure. With respect to consideration (i) in the DOI notice, we note that deep-sea corals are not common except in the canyons and deeper, steeper, areas of the continental slope. Specifically, coral habitats along the continental margin tend to occur beyond the shelf break, which occurs between 200-300 meters. Roughly half of the part of the Monument that protects the canyons is shallower than 200 meters, the depth typically used to indicate the inshore canyon boundary. It is unlikely that many corals are in this area. To the extent that deep-sea coral habitats are considered "objects to be protected", the footprint of the canyon section of the monument may exceed "the smallest area compatible with proper care and management".

The Council recognizes that there are activities beyond the Council's authority which may be appropriate to regulate within marine national monuments. However, we agree with the position taken by the Council Coordination Committee (CCC) in May 2016 and May 2017 that the management of fisheries in marine monuments should remain under the jurisdiction of the Councils and NMFS, administered through the Magnuson Stevens Fishery Conservation and Management Act. As noted by the CCC in its May 2017 letter, designation of marine national monuments disrupts the Council's ability to manage species throughout their range as required by MSA. Specific to consideration (B) in the NOAA notice, we would argue that pre-designation consultation with Federal, State, and tribal entities affected fell short of the process fisheries stakeholders expected, based on their experience with the public process for fisheries regulation conducted under the Magnuson Stevens Act.

Compare the process used during development of our Deep-Sea Coral Amendment with that used to develop the Monument. The Council used a technical team that compiled and analyzed fishery and deep-sea coral information. This team consulted with industry and the Atlantic States Marine Fisheries Commission to supplement available data on the lobster fishery. The team reported to a Committee that identified alternative management areas in a series of public meetings that spanned nearly two years. The Committee worked to balance coral protection with limited impacts on fisheries using the data developed by the technical team. Two workshops were held to solicit additional input on proposed area boundaries and the expected impacts. Public hearings were held throughout New England to explain the alternatives and solicit input.

A suggestion offered at these meetings was added for consideration and will be analyzed fully before the final decision this fall.

In contrast, the initial Monument proposal was developed by a closed group of environmental organizations without any public input or notice that it was being developed. After a public affairs event, it was submitted for consideration to the federal government. While staff of the Council on Environmental Quality did meet several times with interested parties over a period of about seven months, they never provided a chart showing the boundaries that they were considering, and never circulated a proposal that detailed specific restrictions until the Monument was announced. The impacts of the action were never analyzed in any formal manner – or, if they were, the analyses were never published for public review.

It is our view that if the Northeast Canyons and Seamounts Marine National Monument is retained, the limitations on fishing activity implemented by its designation should be rescinded. A clear purpose and need for the Monument should be identified, and any fishing restrictions needed to meet that purpose and need should be developed through the Council process and implemented under the provisions of the Magnuson-Stevens Act. If necessary, the Secretary of Commerce should adopt measures for fisheries beyond the Council's jurisdiction.

We stand ready to work with the National Oceanic and Atmospheric Administration and the Department of the Interior as you complete you review of this national marine monument. If there is any additional information we can provide, please contact Executive Director Thomas Nies at 978-465-0492.

Sincerely,

John Quinn
Council Chairman

Attachment – Excerpts from NEMFC Omnibus Deep-Sea Coral Amendment, June 2017

cc: Mr. Chris Oliver, NMFS Assistant Administrator for Fisheries
Mr. John Bullard, GARFO Regional Administrator
Regional Fisheries Management Councils

1 Introduction

The New England Fishery Management Council (Council) develops fishery management plan amendments in compliance with the Magnuson Stevens Fishery Conservation and Management Act (MSA), the National Environmental Policy Act (NEPA), and other applicable laws. Under NEPA, the Council evaluates a range of possible alternative approaches to addressing identified issues, and the analysis includes evaluation of the no action alternative, i.e. the ongoing management approach should no action be taken by the Council. In the case of the coral amendment, the No Action alternative (Section 4.1 of the amendment document) includes two closures with the same boundaries in both the Monkfish and Mackerel/Squid/Butterfish (MSB) Fishery Management Plans, three closures in the Tilefish Fishery Management Plan, and the Northeast Canyons and Seamounts Marine National Monument.

While none of these areas was designated under the discretionary coral protection authority in section 303(b) of the MSA, they all encompass coral habitats and provide some measure of protection for coral habitats through fishing gear restrictions. The monkfish and MSB closures in Oceanographer and Lydonia canyons are closed to vessels using days at sea in those fisheries. The tilefish gear restricted areas are in shallower parts of Oceanographer, Lydonia, and Veatch Canyons. These areas are closed to mobile bottom-tending gear. The Monument areas were closed to all commercial fishing on November 15, 2016, except red crab and lobster trap fisheries, closure of which will take effect seven years from the date of designation (i.e., 2023).

The following discussion, figures, and tables were adapted from the Omnibus Deep-Sea Coral Amendment. A recent draft of the amendment is available on the Councils webpage at http://www.nefmc.org/library/omnibus-deep-sea-coral-amendment. Because the fishery management closures in the monkfish, mackerel/squid/butterfish, and tilefish plans overlap with the marine national monument, the impacts described here are not additive.

2 Impacts on human communities

Under No Action, the fishing restrictions would remain in place associated with the two closures in the Monkfish and Mackerel/Squid/Butterfish (MSB) FMPs, three closures in the Tilefish FMP, and the Northeast Canyons and Seamounts National Monument. The Monument has been closed to all commercial fishing since November 2016, with the exception of the lobster and red crab fisheries, which have seven years to cease operations within the Monument.

With the Monument implementation, it is difficult to determine if fishermen would be precluded from fishing altogether or be able to shift effort to other areas. The lobster fishery is particularly territorial (Acheson 1987; 2006), such that efforts to shift effort to areas remaining open may be difficult for those displaced by the closures. The industry input from the NEFMC coral workshops was consistent with this (NEFMC, 2017). To the degree that these closures provide habitat for fishery species, there may be long-term benefits to fisheries and society, but these are difficult to project.

2.1 Fishery impacts

2.1.1 Prior impacts of the No Action Monkfish/MSB/Tilefish areas

Monkfish Areas: It is unlikely that the monkfish fishery was substantially impacted by closing Lydonia and Oceanographer canyons, and continuing this closure under No Action would likely have negligible impact. Since 2005, though Amendment 2 to the Monkfish FMP, fishing with any gear type while on a monkfish Day-at-Sea (DAS) in these Canyons (deeper than 200 m) has been prohibited. At the time, the impacts analysis indicated that this closure was designed to "prevent an expansion of the offshore monkfish into the deeper (>200 m) portions" of these canyons, and that the directed fishery was not operating within the closure. Thus, no negative economic impacts to the directed fishery were associated with the closure (In 2001, there were four non-directed trips with a combined monkfish revenue of $68,000; NEFMC 2004, p. 41, 423).

Mackerel/Squid/Butterfish Areas: It is unlikely that the mackerel, squid, or butterfish fisheries were substantially impacted by closing Lydonia and Oceanographer canyons, and continuing this closure under No Action would likely have negligible to potentially positive impacts on the fishery in the long-term if protecting essential fish habitat improves the resource. In 2008, these canyons (same boundaries as the monkfish closure) became closed to bottom trawl fishing for mackerel, squid, or butterfish via Amendment 9 to that FMP – with the intent of reducing essential fish habitat impacts. At the time, the impacts analysis indicated that this closure would "have a minimal impact on revenues both for vessels and ports" (MAFMC, 2008; p, xi).

Tilefish Areas: It is unlikely that the tilefish fishery was substantially impacted by closing Lydonia, Oceanographer, Veatch and Norfolk canyons (Norfolk is outside the New England region), and continuing this closure under No Action would likely have negligible to potentially positive impacts on the fishery in the long-term if protecting essential fish habitat improves the resource. In 2008, these canyons were closed to all bottom-tending mobile gear via Amendment 1 to the Tilefish FMP – with the intent of reducing impacts known clay outcrop tilefish habitat. At the time, the impacts analysis (based on VTR data) indicated that, in 2005, $207,096 in revenue from all fisheries in was derived from these canyons (just Oceanographer and Veatch), and just $1,287 from tilefish. These totals were much smaller than what was derived from other canyons in the Mid-Atlantic that remained open through this action ($6M).

2.1.2 Estimates of recent fishing activity within the No Action areas

Due to data limitations, it is impossible to know the true amount of fishing activity that has occurred within the No Action areas. Thus, multiple approaches are used to estimate fishing activity, and thus characterize the potential fishery impacts of No Action.

VTR analysis: Vessel Trip Report data were used to estimate recent (2010-2015) fishing activity within the No Action areas. Note that the No Action Monkfish/MSB/Tilefish areas were in effect during the period encompassed by this analysis, but the National Monument was implemented subsequently. Except for lobster trap gear, revenue results were unscaled. Because some lobster vessel operators are not required to submit VTRs (their vessels do not carry other federal permits), total lobster revenue was expanded (method explained in Section 7.1.3.2 of the coral

amendment). Maps of revenue by gear type and species are in Section 13 of the coral amendment.

Revenue: From 2010-2015, an annual average of $0.4M of fishing revenue is attributed to the area of the Monkfish/MSB/Tilefish areas, with higher than average values in 2014 and 2015 (Figure 1). The recent revenue attributed to fishing with mobile bottom-tending gear from these areas is about 47% of the total, or $207K annually. In terms of specific gears, revenue is primarily attributed to bottom trawls, lobster pots, other pots, and scallop/clam dredges; separator and Ruhle trawls and sink gillnet revenues are minor. Since bottom trawl was prohibited in these areas during 2010-2015, comparison with the more spatially refined VMS data below helps shed additional light on this finding.

The National Monument (Figure 2), which is larger, shallower and encompasses most of the Monkfish/MSB/Tilefish areas, has a more revenue attributed to it, averaging $1.8M annually. During 2010-2015, there was a substantial scallop dredge fishery on the southeastern part of Georges Bank, close to, but not within, the Monument boundary – the spatial imprecision of VTR data may explain these high revenues inferred to the Monument. The recent revenue attributed to fishing with mobile bottom-tending gear from the Monument area is about 62% of the total, or $1.1M annually. In terms of specific gears, revenue is primarily attributed to bottom trawl, lobster pot, and scallop/clam dredges, with smaller contributions from separator and Ruhle trawls.

Species: Lobster, Jonah and red crabs, and scallops are the highest value species of the top 10 species with landings attributed to the Monkfish/MSB/Tilefish areas (Figure 3), although an increase in revenue from butterfish is evident in 2012-2015. Longfin squid is consistently in the top ten, but more variable from year to year. Silver hake, another small mesh trawl species, is also a consistent contributor to revenues in these areas. Other trawl-caught resources include flounders, mackerel, and haddock. There have been recent increases in effort in the Jonah crab fishery, and a spike in red crab revenue generated from the area occurred in 2014. Revenues in the Jonah crab fishery are likely to remain above historic levels for the foreseeable future (Megan Ware, ASMFC, pers. comm., 2017). Revenue from sea scallops is particularly prominent in 2015.

The results for the National Monument (Figure 4) are similar in terms of the top 10 species by revenue, but emphasize sea scallop revenues relative to the Monkfish/MSB/Tilefish. This is likely the result of the Monument's larger size overall, and its extension into shallower areas of the continental shelf.

Focusing on monkfish, to determine how the 2005 closure of Oceanographer and Lydonia Canyons has impacted the fishery, the VTR analysis indicates that for the five discrete canyon zones that overlap the monument, monkfish was not within the top ten species landed by revenue (see section 7.4.3 of amendment document). Monkfish revenue was within the top ten species attributed to the 15 canyons that do not overlap the monument, each year during this recent time period, but just about $100,000 or less annually (see section 7.4.3 of amendment document). Thus, there may be recent monkfish fishing in canyons other than Oceanographer and Lydonia,

though at least some of this revenue may be an artifact of the VTR analysis, with true fishing locations in shallower waters.

Focusing on mackerel, squid and butterfish, to determine how the 2008 closure of Oceanographer and Lydonia Canyons has impacted the fishery, the VTR analysis indicates that for the five discrete canyon zones that overlap the monument, mackerel, squid, and butterfish were within the top ten species landed by revenue (see section 7.4.3 of amendment document) each year during this recent time period, but it about $120,000 or less annually. For the 15 canyons that do not overlap the monument, revenue for butterfish and squid were within the top ten species attributed each year during this recent time period, about $250,000 or less annually (see section 7.4.3 of amendment document). Thus, there may be recent MSB fishing in canyons other than Oceanographer and Lydonia, though at least some of this revenue may be an artifact of the VTR analysis, with true fishing locations in shallower waters. Fishery stakeholders have emphasized recent increases in butterfish effort along the entire shelf break, owing to quota increases since 2013. Thus, butterfish revenues prior to 2014 underestimate future revenues from this species.

Owners: Between 2013 and 2015, the number of vessel owners with revenue attributed to the Monkfish/MSB/Tilefish areas and the National Monument respectively average 120 and 90 annually. For both, the percent revenue for owners fishing within these regions is typically in the low single digit percentages, but higher for some individuals, with some outlier owners generating as much as 5-10% of their revenue in these areas (Figure 9, Figure 11). This indicates that most of the potentially affected owners generate only a small fraction of their annual revenue from these areas, but a few owners derive a larger fraction of their annual revenue from the area. The most highly exposed owners fishing within the Monkfish/MSB/Tilefish areas tend to be pot fishermen, which is not surprising given the existing gear restrictions in these areas on mobile bottom-tending gears. This is in contrast with the National Monument, where a small number of owners employing mobile bottom-tending gears appear to be highly exposed.

VTR vs. VMS comparison: Between 2010 and 2015, an average of 317 bottom trawl trips and 266 lobster pot trips overlap the National Monument and 388 bottom trawl trips and 419 lobster pot trips overlap the Monkfish/MSB/Tilefish areas. Together, bottom trawl and lobster pot are the dominant gear types used on VTR-documented trips occurring in and around the No Action areas. The VMS data deemphasize scallop and clam dredge effort, with an average of 41 dredge trips overlapping the Monkfish/MSB/Tilefish and 51 trips overlapping the National Monument areas respectively.

For the permits (i.e., vessels) with 2010-2015 fishing attributed to either the Monkfish/MSB/Tilefish areas or the National Monument, bottom trawl gear is the most common gear type, though there is a decline through time, from ~120 to ~50 vessels fishing with bottom trawls in each area. Around 25 lobster vessels fished in the vicinity of these areas, again, with slightly more permits being fished around the Monkfish/MSB/Tilefish areas (including Veatch Canyon). Vessels with scallop and clam permits also report fishing in and around the areas. As noted above, larger numbers of permits report activity near the National Monument than in the Monkfish/MSB/Tilefish areas, likely because the Monument extends into shallower waters. There is a small number of permits that report using separator or Ruhle trawls in each of the

areas, and some permits reporting the use of gillnet gear in the Monkfish/MSB/Tilefish areas only. This reflects the concentration of gillnet effort in offshore RI and southeastern MA, but not further to the east where the Monument is located.

For both the Monkfish/MSB/Tilefish areas and the National Monument, the percent of VTR trips with Vessel Monitoring System (VMS) data in 2010-2012 is high for scallop dredge (93-100%), bottom trawl (84-94%), and Separator and Ruhle trawl trips (71-84%; Table 1). This indicates that these gears in these areas are well represented in the VMS data. For these gears, the VMS analysis represents fishing effort at a much more refined scale, and covers the vast majority of trips in the region. The same cannot be said for lobster pot and other gears, whose low level of VMS coverage (0-16%) would result in greater error when extrapolating the VMS results. It is unknown whether these same levels of overlap between VMS and VTR trips existed prior to 2010, given that VMS coverage has not been consistent across time. Bottom longline and gillnet VMS data have not yet been processed.

In general, the more spatially refined analysis using VMS data indicates that only 15-35% of permits attributed to fishing in the No Action management areas by the VTR analysis had VMS points falling within the regions of interest, for gears with good coverage (Table 2). Although the magnitude differs substantially, the interannual trends are generally consistent between the VTR and VMS analyses for trips and permits in the No Action areas. About 15% of VTR trips identified to be fishing within the Monkfish/MSB/Tilefish areas have VMS points falling within those regions, and the probability-weighted hours fished indicates a relatively small amount of effort is being expended in these regions by bottom trawl, squid trawl, and scallop dredges. This is intuitive, because these areas are currently closed to these gears. While more spatially precise than VTR data, VMS data nonetheless are a model of fishing distribution, and there are likely some errors in the attribution of specific VMS polling locations as fishing vs. non-fishing. The larger National Monument encompasses substantially more effort by bottom and squid trawls, although there is also substantial inter-annual fluctuation. About 25% of trips identified in the VTR analysis as having fished in the National Monument between 2010 and 2012 have corresponding VMS polls falling within the area.

The relative magnitude of effort estimated between the Monkfish/MSB/Tilefish areas and the National Monument are very similar between the VTR and VMS analyses. For 2010 to 2012, the ratio of revenue (VTR) and hours fished (VMS) in the Monkfish/MSB/Tilefish areas to the revenue/hours fished in the National Monument ranges from 14-20% in the VTR and 9-20% in the VMS, for trawls. This indicates both VMS and VTR paint a similar picture regarding the relative amount of fishing across the two regions. The scallop dredge ratios conform less across the two analyses, with the VMS analysis indicating no real concentration of fishing effort in either of these two areas using this gear. This is expected given the depths at which sea scallops generally occur in commercial abundance (i.e., below 110 m).

Figure 9, Figure 10, Figure 11, and Figure 12 provide the percentage of a permit's overall probability-weighted VMS effort within the Monkfish/MSB/Tilefish areas and the National Monument. Although this is expected to differ at least slightly from the percentage of owner revenue generated in each of these regions (Figure 5, Figure 6, Figure 7, Figure 8), due to the fact that multiple permits can belong to the same ownership group, there is substantial

concurrence between the two metrics. Both metrics indicate that the vast majority of individuals fishing within the Monkfish/MSB/Tilefish areas expend less than 1% of effort and generate less than 1% of total revenue in this region. For a similar majority, less than 5% of effort expended and total revenue generated is calculated to fall within waters of the National Monument.

It should be noted that most VMS transponders are programmed to send spatial coordinates once an hour. Given that bottom trawl vessels in the region tend to fish at a speed of 2-5 knots, while scallop dredges fish at 2-7 knots (Palmer and Wigley, 2007), there is potential for this VMS point analysis to underestimate the actual numbers of fishermen fishing within a relatively small region such as the Monkfish/MSB/Tilefish areas. Although less of an issue with the larger National Monument, the VMS data indicate a mismatch between the size of the management areas under consideration and the spatial precision of the data available to assess the impacts of the areas.

Figure 10 and Figure 12 present the percentage of a permit's overall VMS-derived effort generated from MBTG falling within the No Action alternatives. A comparison with Figure 9 and Figure 11 highlights that the most exposed permit holders in the Monkfish/MSB/Tilefish areas tend to be pot fishermen. As was the case with the VTR data, this is not a surprise given the gear restrictions already in place in that area. The distribution of permit-level exposure for bottom-tending and mobile bottom-tending gears in the National Monument is more consistent, indicating that some mobile bottom-tending gear fishermen are exerting a substantial portion of their effort within the bounds of the National Monument. These findings are consistent with the VTR-derived owner exposure.

ASMFC survey: The trap fishery for lobster and Jonah crab is not constrained by the Monkfish/MSB/Tilefish areas, but the National Monument will be closed to this gear type starting in 2023. The ASFMC survey of Area 3 lobster permit holders did not ask lobstermen to identify their fishing activity within the No Action Monkfish/MSB/Tilefish areas specifically, but there is likely to be less gear conflict with mobile gear in these areas relative to areas of similar depth open to mobile gear. Thus, the Monkfish/MSB/Tilefish may be more important to lobstermen relative to surrounding areas.

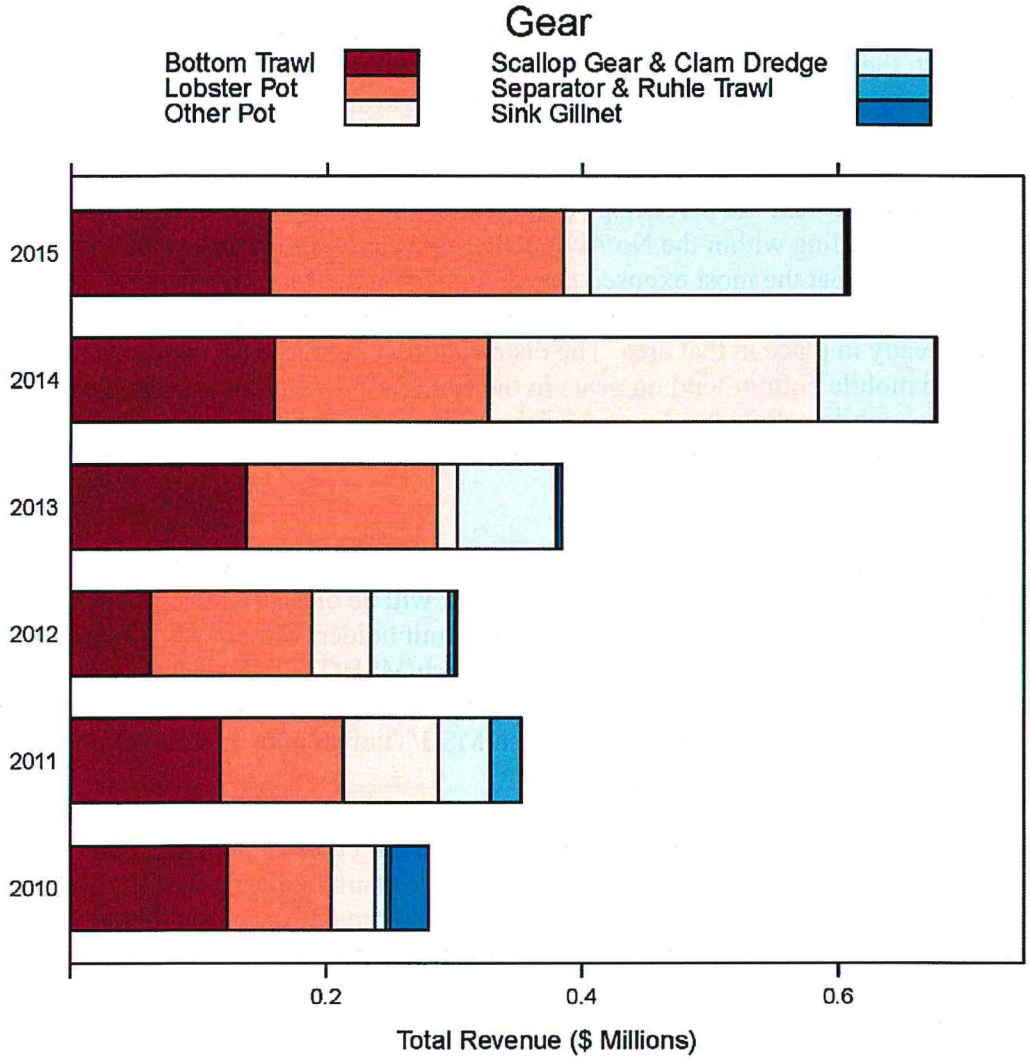
The survey did identify recent (2014-2015) fishing activity within the boundaries of the National Monument that will be closed to the fishery in the future. The results indicate that 12-14% of the offshore lobster fishery effort and 13-14% revenue ($2.4-2.8M annually) for the lobster and Jonah crab fishery comes from the area of the National Monument. This revenue is higher than that derived from the VTR analysis (about $0.7M annually, Figure 4).

2.1.3 Summary of fishery impacts

Given the high VMS coverage for bottom trawl, scallop dredge, and separator and Ruhle trawls in these areas, for these gears the estimates of fishing activity exposed are better assessed through VMS rather than VTR. Conversely, given the low coverage of lobster pot fishing in the region, the ASMFC survey provides an upper bound (~$2.4-$2.8M), while VTR provides a lower bound ($0.7M), on the uncertainty in revenue generated from regarding the trips and permits historically fishing within the Monkfish/MSB/Tilefish areas and the National Monument. For sink gillnets and clam dredges, only the VTR analysis is currently available.

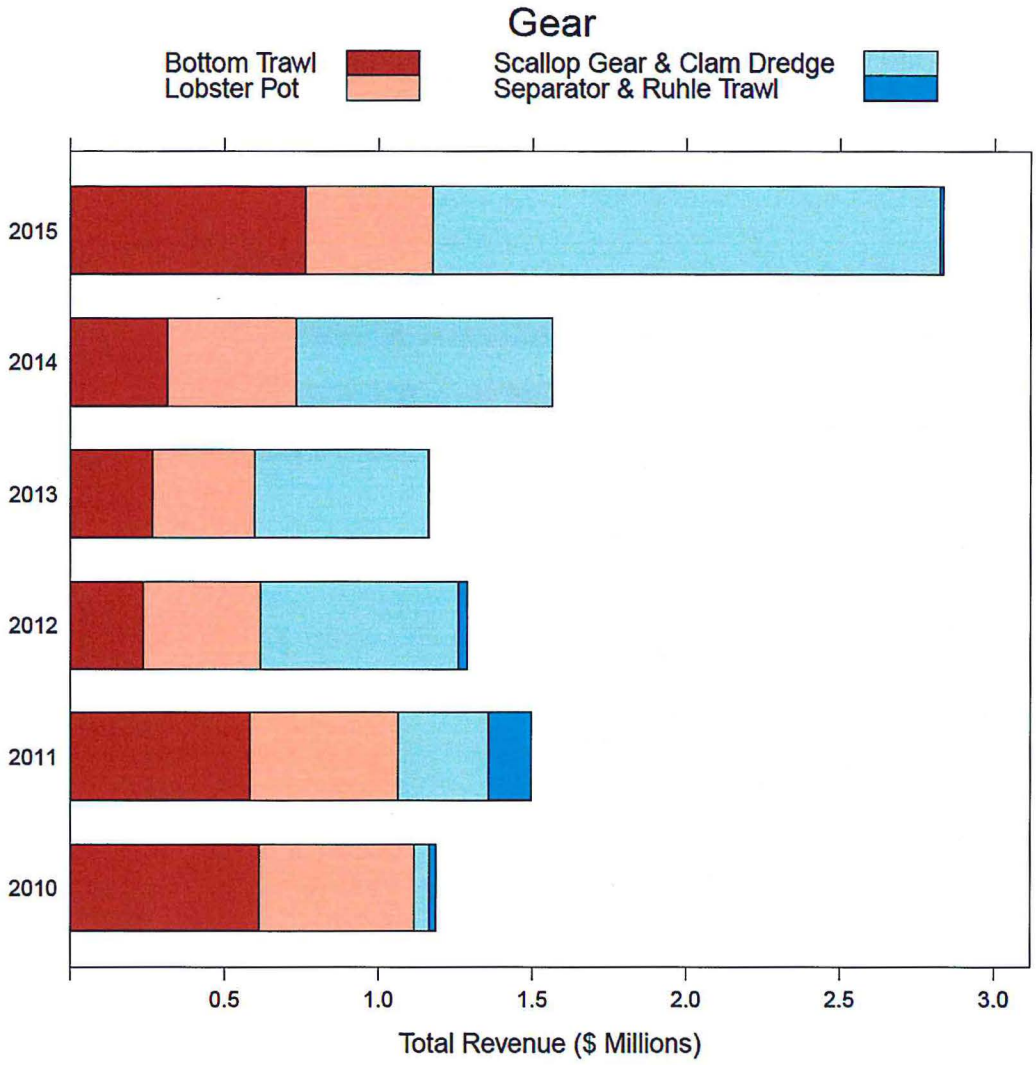
Although the high uncertainty regarding these estimates might upon first blush seem problematic, the percentage of revenue and effort, assessed at the owner and permit level respectively, consistently indicate a low level of fishing activity for the vast majority of individuals estimated to use these waters. However, a very small number of individuals seem to be using these areas more intensively.

Figure 1 – Revenue by gear type attributed to the No Action Monkfish/MSB/Tilefish areas within Veatch, Oceanographer, and Lydonia Canyons, 2010-2015.



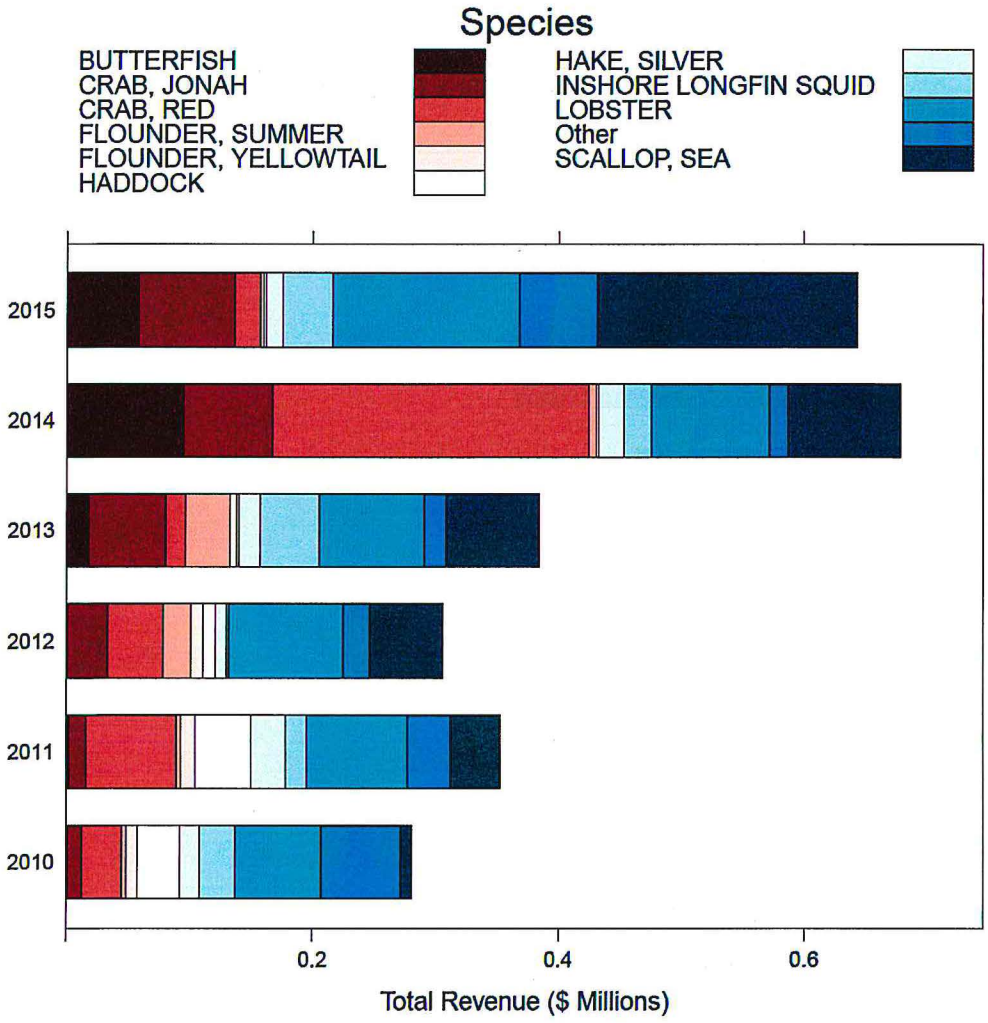
Source: **VTR analysis.**

Figure 2 – Revenue by gear type attributed to the Northeast Canyons and Seamounts Marine National Monument, 2010-2015.



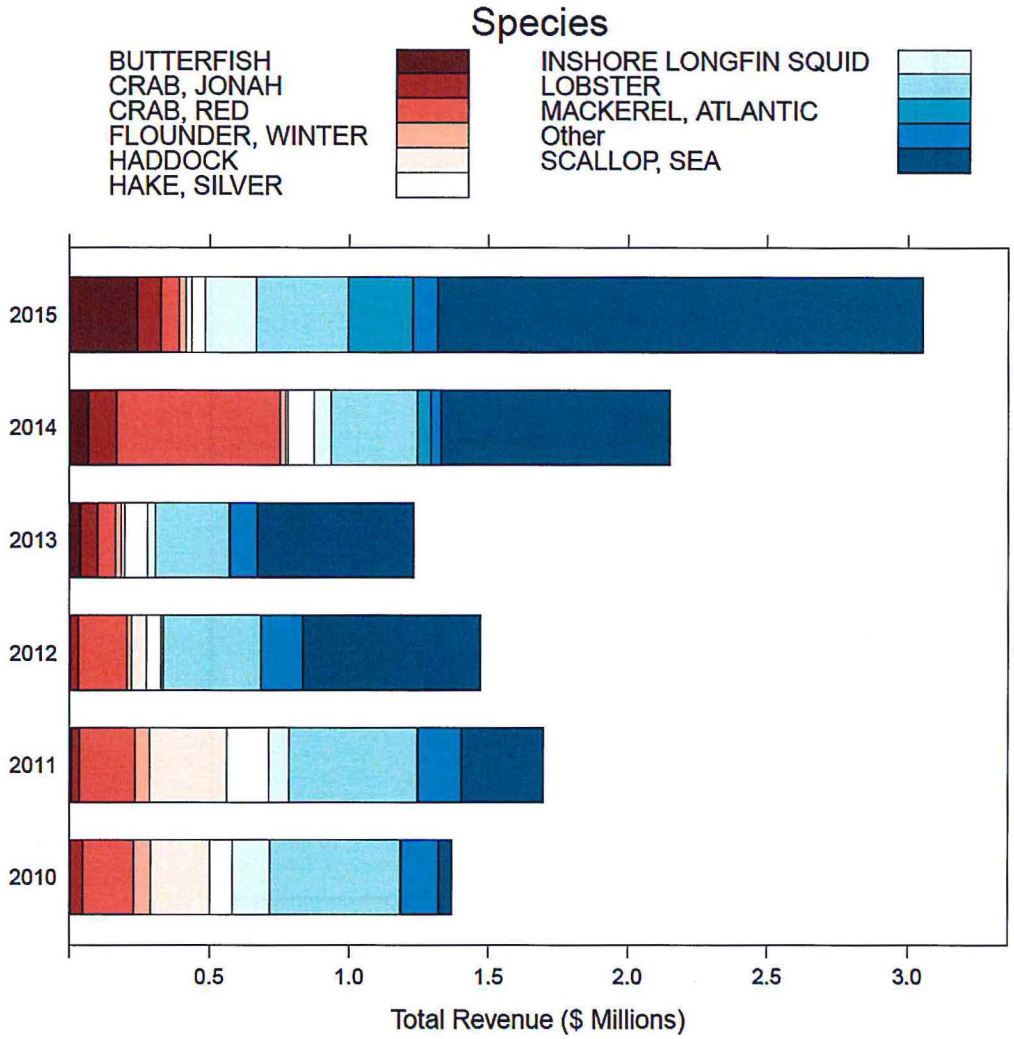
Source: **VTR analysis.**

Figure 3 – Revenue by species (top 10) attributed to the No Action Monkfish/MSB/Tilefish areas within Veatch, Oceanographer, and Lydonia Canyons, 2010-2015.



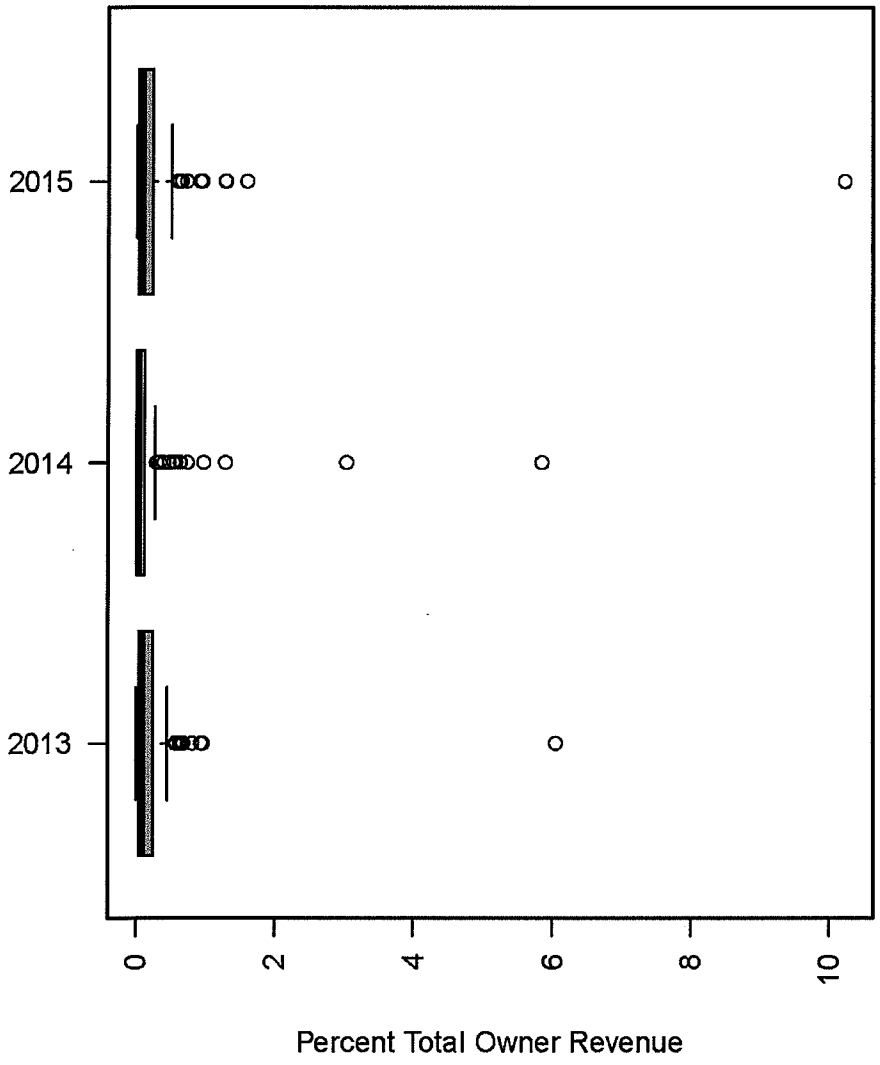
Source: **VTR analysis.**

Figure 4 – Revenue by species (top 10) attributed to the Northeast Canyons and Seamounts Marine National Monument, 2010-2015.



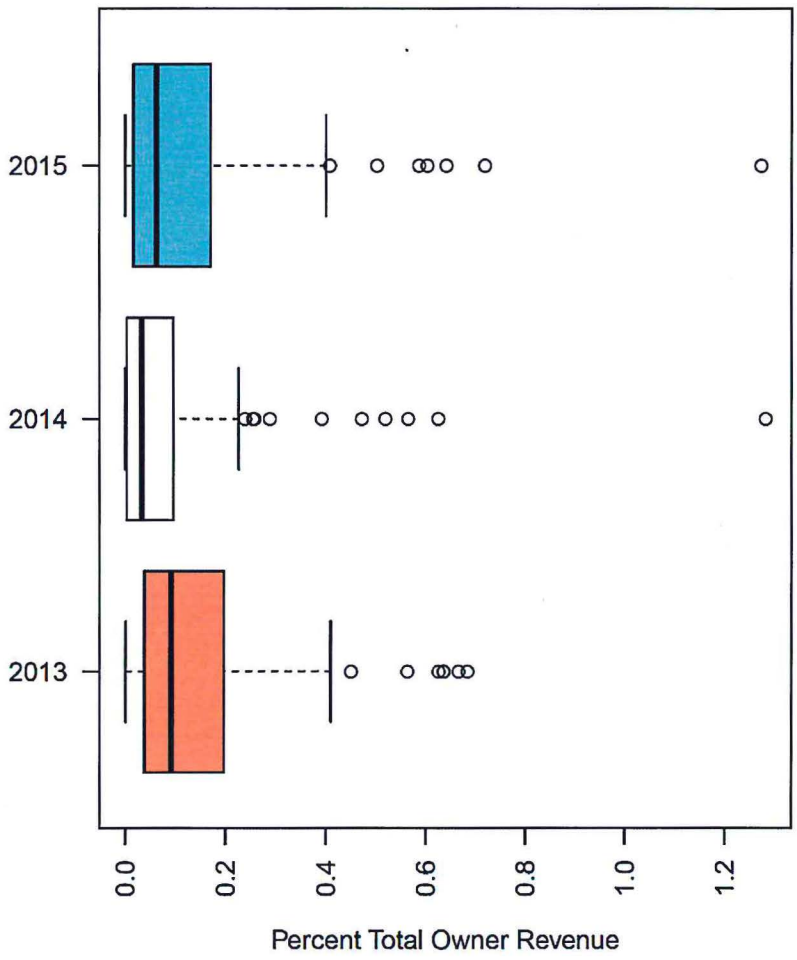
Source: **VTR analysis.**

Figure 5 – Percent of vessel owner revenue attributed to the No Action Monkfish/MSB/tilefish areas, 2013-2015.



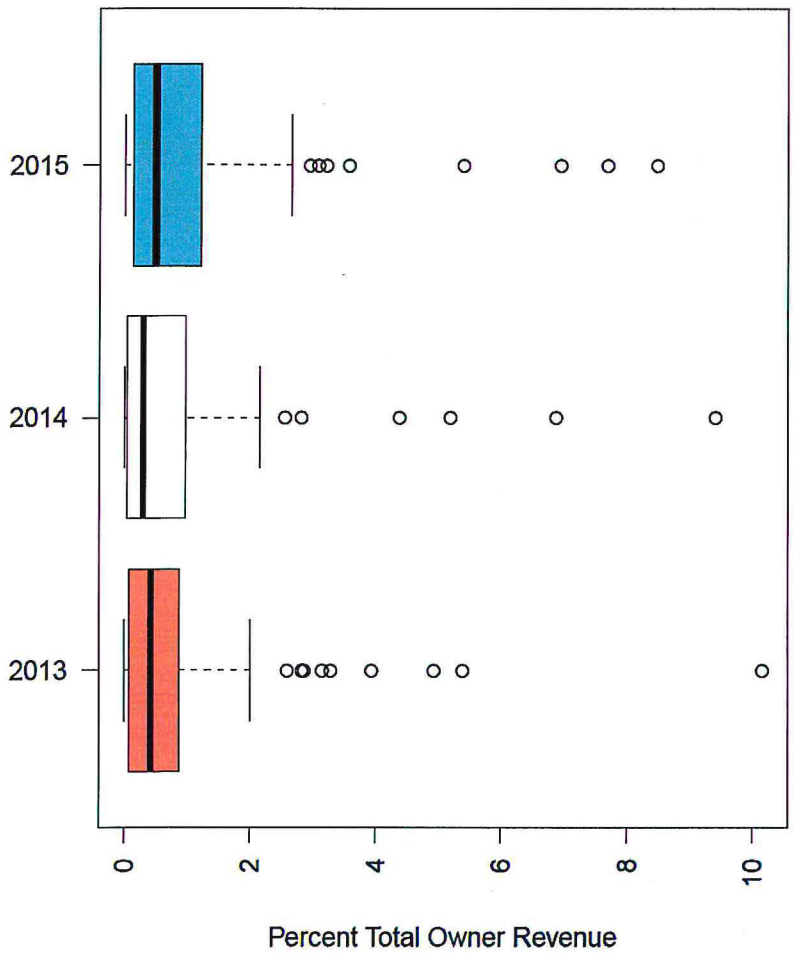
Source: **VTR analysis. Open circles are individual owners with a % total revenue 1.5 time above the 75% percentile.**

Figure 6 – Percent of vessel owner revenue attributed to MBTG within the No Action Monkfish/MSB/tilefish areas, 2013-2015.



Source: **VTR analysis. Open circles are individual owners with a % total revenue 1.5 time above the 75% percentile.**

Figure 7 – Percent of vessel owner revenue attributed to the Northeast Canyons and Seamounts Marine National Monument, 2013-2015.



Source: **VTR analysis. Open circles are individual owners with a % total revenue 1.5 times above the 75% percentile.**

Figure 8 – Percent of vessel owner revenue attributed to MBTG within the Northeast Canyons and Seamounts Marine National Monument, 2013-2015.

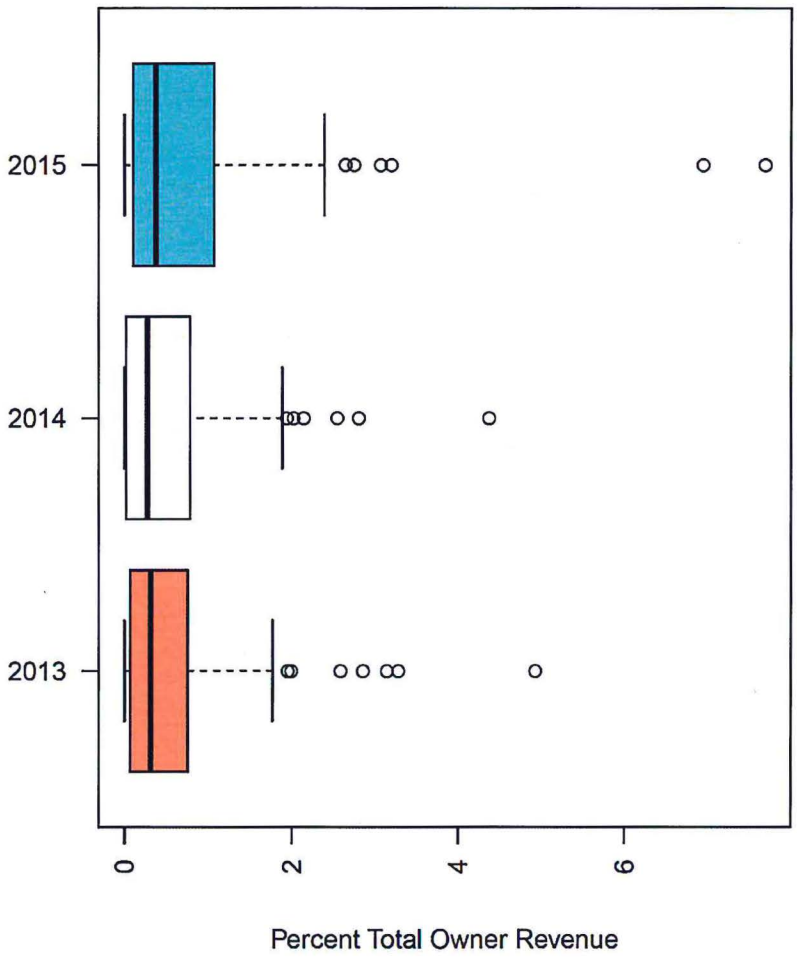


Table 1 – Percentage of VTR trips by gear type attributed to the No Action management areas that have VMS coverage, 2010-2012.

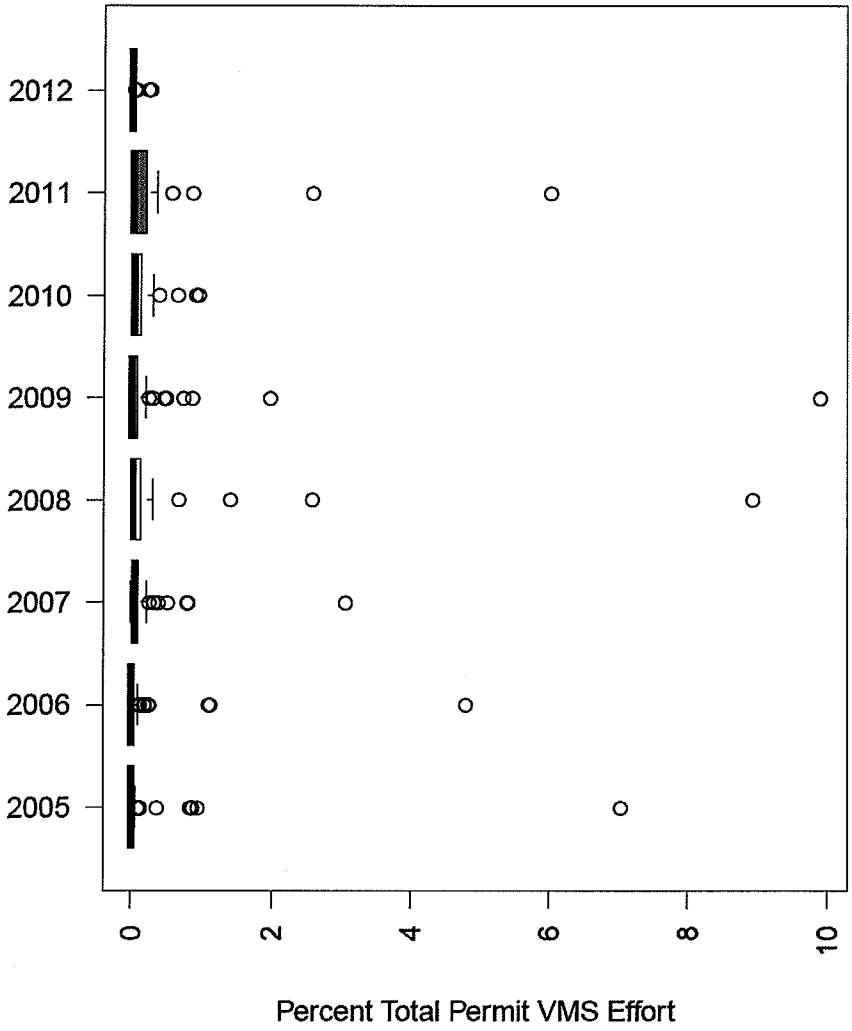
		No Action Monkfish Tilefish Areas				National Monument			
Gear	Year	Permits	VTR Trips	VMS Trips	Coverage	Permits	VTR Trips	VMS Trips	Coverage
Bottom Trawl	2010	117	575	539	94%	107	545	513	94%
Bottom Trawl	2011	99	481	430	89%	90	459	411	90%
Bottom Trawl	2012	100	351	296	84%	71	280	235	84%
Lobster Pot	2010	30	491	76	15%	21	309	49	16%
Lobster Pot	2011	30	420	28	7%	22	296	9	3%
Lobster Pot	2012	22	370	0	0%	18	257	1	0%
Scallop Gear & Clam Dredge	2010	8	8	8	100%	15	17	16	94%
Scallop Gear & Clam Dredge	2011	21	22	20	91%	27	30	28	93%
Scallop Gear & Clam Dredge	2012	29	35	35	100%	42	57	57	100%
Separator & Ruhle Trawl	2010	12	30	24	80%	14	40	30	75%
Separator & Ruhle Trawl	2011	30	110	92	84%	32	113	94	83%
Separator & Ruhle Trawl	2012	18	45	32	71%	19	46	33	72%
Other Pot	2010	4	27	0	0%	-	-	-	-
Other Pot	2011	3	20	0	0%	-	-	-	-
Other Pot	2012	5	31	0	0%	-	-	-	-
Sink Gillnet	2010	9	53	0	0%	-	-	-	-
Sink Gillnet	2011	7	29	0	0%	-	-	-	-
Sink Gillnet	2012	9	53	0	0%	-	-	-	-

Table 2 – VMS-derived estimates of effort (hours fished, permits, and trips) within the No Action management areas, by gear type

		No Action Monkfish Tilefish Areas			National Monument		
Gear	Year	Hours Fished	Permits	Trips	Hours Fished	Permits	Trips
Bottom Trawl	2005	19.32	20	39	614.52	50	149
Bottom Trawl	2006	48.51	25	44	373.21	49	101
Bottom Trawl	2007	57.70	46	71	756.01	55	127
Bottom Trawl	2008	23.41	23	61	433.21	31	103
Bottom Trawl	2009	22.14	19	70	256.56	36	137
Bottom Trawl	2010	40.54	33	85	243.10	37	132
Bottom Trawl	2011	51.33	18	53	305.25	22	91
Bottom Trawl	2012	7.99	11	41	105.40	17	73
Squid Trawl	2005	16.26	33	60	210.59	34	62
Squid Trawl	2006	27.19	32	70	32.41	23	41
Squid Trawl	2007	37.71	39	87	580.87	38	102
Squid Trawl	2008	8.02	8	13	3.84	5	5
Squid Trawl	2009	26.59	8	16	1.87	4	4
Squid Trawl	2010	9.46	10	21	187.75	10	17
Squid Trawl	2011	15.29	12	22	22.42	13	13
Squid Trawl	2012	1.71	6	7	2.71	3	3
Raised Footrope	2006	-	1	-	-	1	-
Trap	2005	1.83	3	5	13.76	3	5
Trap	2006	31.88	3	40	-	2	-
Trap	2007	22.53	3	28	-	2	-
Trap	2008	18.17	3	11	-	2	-
Trap	2009	10.11	3	17	-	1	-
Trap	2010	-	1	-	0.00	0	0
Trap	2011	-	2	-	-	2	-
GC Scallop	2006	-	1	-	-	1	-
GC Scallop	2009	0.00	0	0	-	1	-
GC Scallop	2011	0.00	0	0	-	1	-
GC Scallop	2012	-	1	-	-	1	-
LA Scallop	2005	0.16	25	28	0.20	9	10
LA Scallop	2006	0.18	28	35	1.34	28	40
LA Scallop	2007	0.00	0	0	1.05	3	3
LA Scallop	2008	0.00	0	0	-	1	-
LA Scallop	2009	0.22	12	12	0.56	13	13
LA Scallop	2011	0.73	8	9	0.73	7	7
LA Scallop	2012	0.09	9	9	0.14	9	9

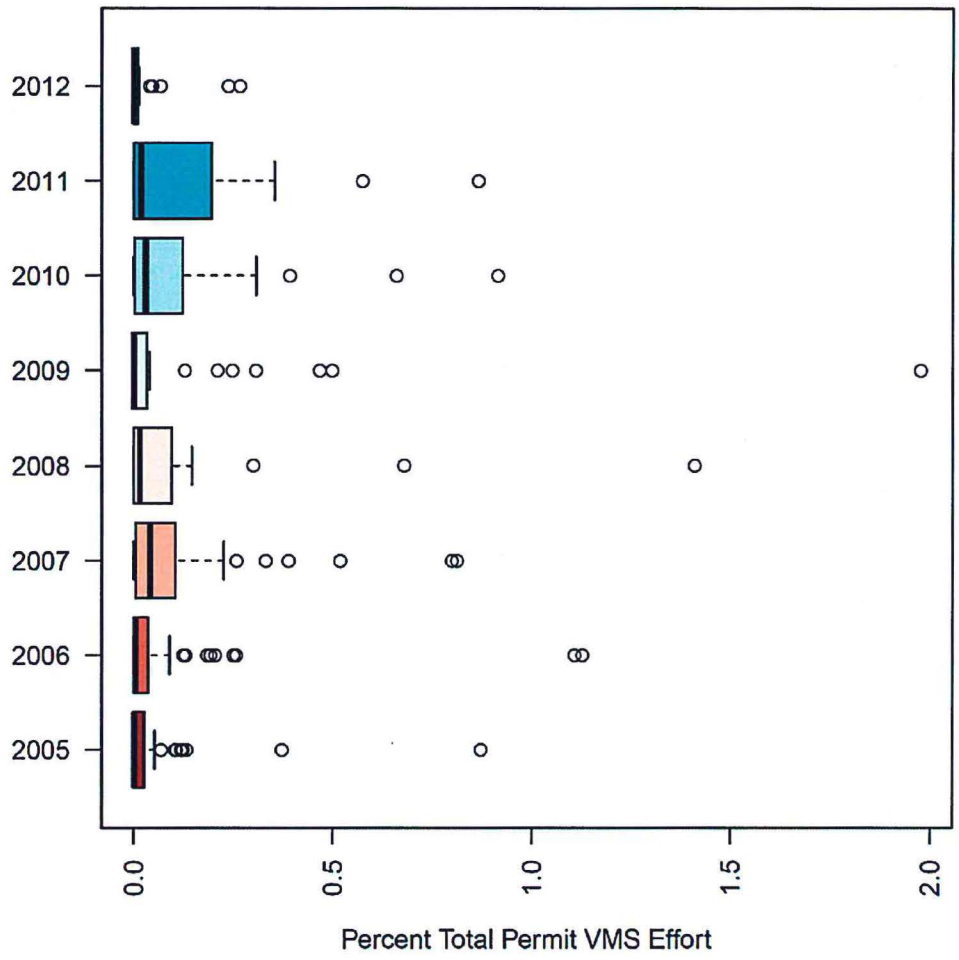
Note: LA and GC refer to limited access and limited access general category scallop gears, respectively.

Figure 9 - Percent of total annual permit fishing activity attributed to the No Action Monkfish/MSB/tilefish areas between 2005 and 2012, as derived from VMS



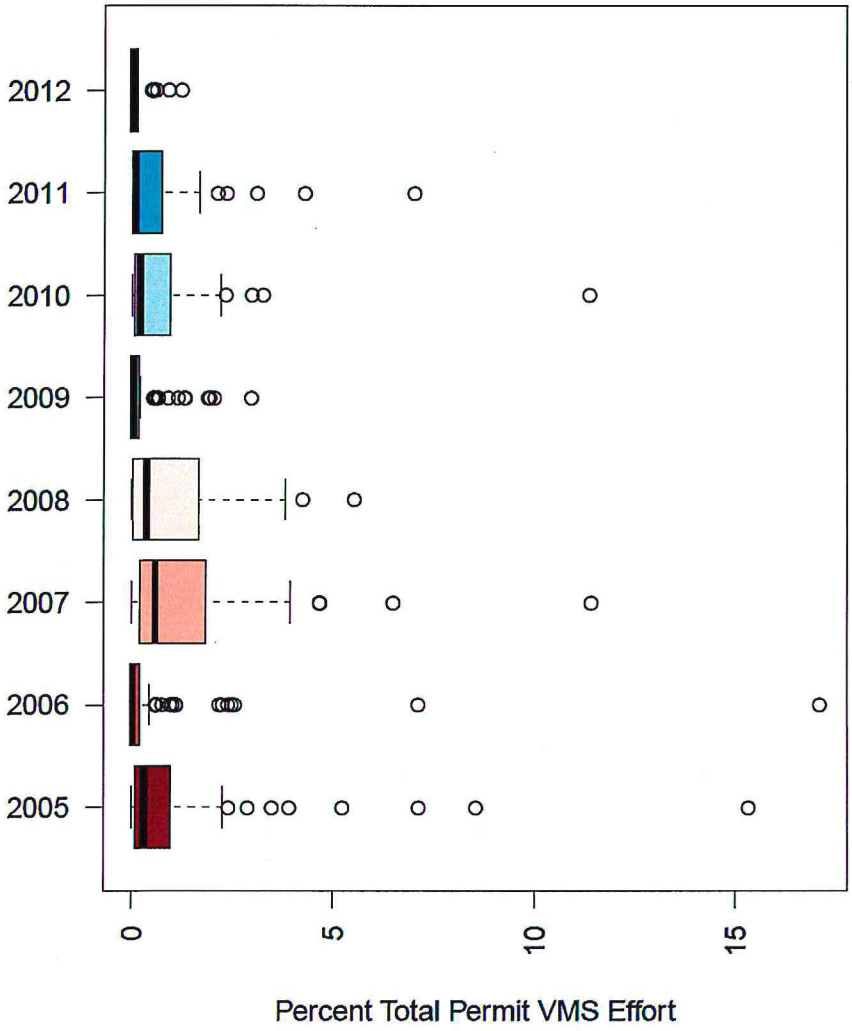
Source: VMS. Note: Open circles are individual owners with a % total revenue 1.5 times over the 75% percentile.

Figure 10 - Percent of total annual permit MBTG fishing activity attributed to the No Action Monkfish/MSB/tilefish areas between 2005 and 2012, as derived from VMS



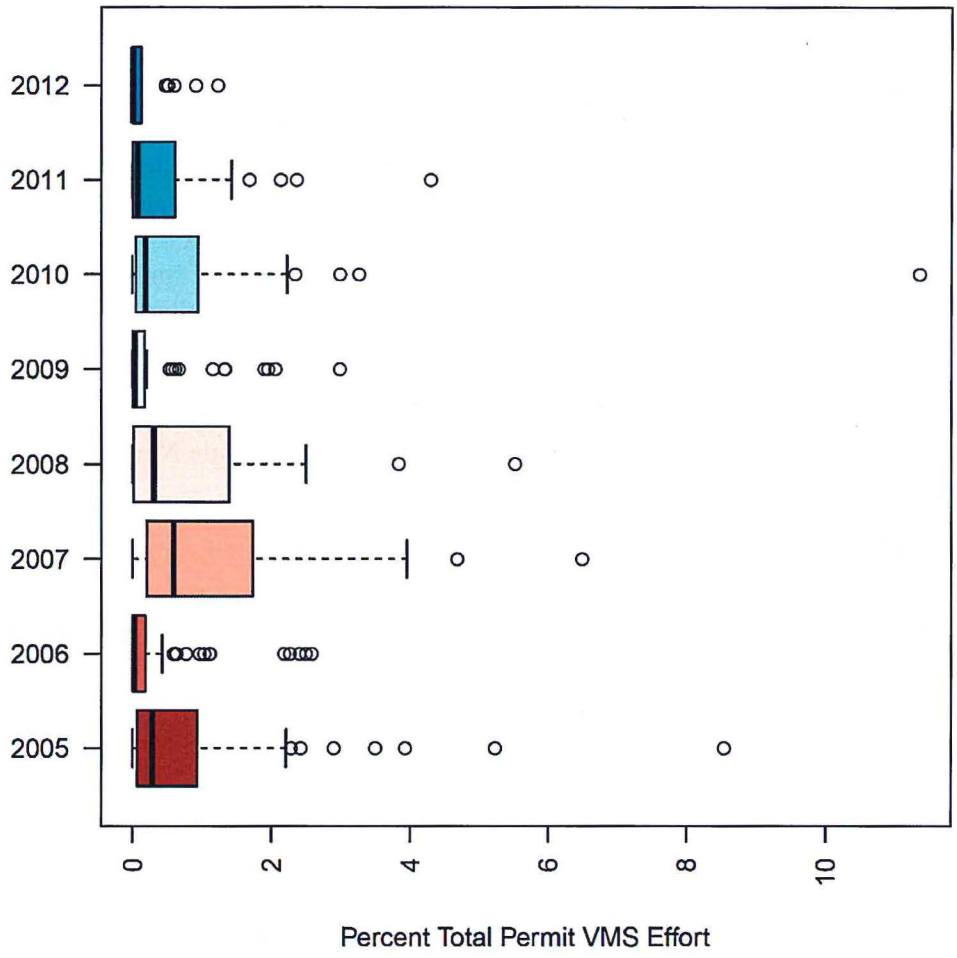
Source: VMS. Note: Open circles are individual owners with a % total revenue 1.5 times over the 75% percentile.

Figure 11 - Percent of total annual permit fishing activity attributed to the Northeast Canyons and Seamounts Marine National Monument between 2005 and 2012, as derived from VMS



Source: VMS. Open circles are individual owners with a % total revenue over 1.5 times over the 75% percentile.

Figure 12 – Percent of total annual permit MBTG fishing activity attributed to the Northeast Canyons and Seamounts Marine National Monument between 2005 and 2012, as derived from VMS



2.2 Fishing community impacts

General community impacts of the alternatives under consideration are described in Section 7.1.2 of the amendment document, which also describes the method, caveats, and data confidentiality standard used to develop Table 3 and Table 4, the revenue by state, region, and port attributed (using the VTR analysis) to recent fishing within the No Action coral zones.

No Action Monkfish/MSB/Tilefish Areas: Although the VTR analysis has some degree of error, it suggests that the fishing communities that may be active within the No Action Monkfish/MSB/Tilefish Areas are primarily located in Massachusetts, with lesser activity attributed to ports in Rhode Island, New York, Virginia, and other states (Table 3). The VTR analysis attributes recent (2010-2015) landings revenue to 45 ports and 411 permits, and 57% of this revenue to ports in Massachusetts. New Bedford (253 permits), Newport (9 permits), and Point Judith (61 permits) are among the top ten landing ports, and 28% of the revenue is attributed to other ports, indicating that the No Action areas may be particularly relevant for those three communities. According to the NMFS Community Vulnerability Indicators, New Bedford, Newport, and Narragansett (includes Point Judith) have a medium-high to high degree of engagement in commercial fishing. Of these three communities, Narragansett ranks highest in terms of reliance on commercial fishing, with a medium-high index, while Newport ranks lowest, with a low index.

The revenue attributed to Massachusetts and Rhode Island from the No Action Monkfish/MSB/Tilefish Areas is about 0.05% and 0.19% of all revenue, respectively, for these states during 2010-2015 (ACCSP data, 2017). Though these are minor fractions, certain individual permit holders could have as much as 10% of their revenue attributed to fishing from these areas (Figure 5, p. 11).

Table 3 – Landings revenue to states, regions, and top ports attributed to fishing within the No Action Monkfish/MSB/Tilefish Areas, 2010-2015 - ALL BOTTOM TENDING GEARS

State/Region/Port	Landings Revenue 2010-2015		Total Permits 2010-2015[a]
	Total $	Average $	
Massachusetts	$1,500K	$250K	301
New Bedford	$1,332K	$222K	253
Sandwich	$109K	$18K	3
Gloucester	$31K	$5K	25
Other (n=13)	$28K	$5K	57
Rhode Island	$879K	$146K	70
Newport	$399K	$67K	9
Point Judith	$183K	$31K	61
Other (n=4)	$297K	$48K	12
Connecticut	$14K	$2K	10
New York	$73K	$12K	12
Montauk	$72K	$12K	10
New Jersey	$27K	$4K	14
Virginia	$60K	$10K	55
Newport News	$26K	$4K	29
Other (n=3)	$34K	$6K	33
North Carolina	$4K	$1K	27
Other state(s)[b]	$87K	$15K	15
Total	**$2,645K**	**$441K**	**407**

Notes: Ports listed are the top 10 ports by landing revenue that are non-confidential.
[a] Totals may not equal the sum of the parts, because permits can land in multiple ports/states.
[b] Includes confidential state(s).
Source: VTR analysis.

National Monument: Although the VTR analysis has some degree of error, it suggests that the fishing communities that may be active within the Northeast Canyons and Seamounts Marine National Monument are primarily located in Massachusetts, with lesser activity attributed to ports in Rhode Island, New Jersey, New York, and other states (Table 4). The VTR analysis attributes recent landings revenue to 35 ports and 359 permits, and 67% of this revenue to ports in Massachusetts. New Bedford, (253 permits) Newport, (6 permits) and Sandwich (38 permits) are among the top ten landing ports, and 27% of the revenue is attributed other ports, indicating that the areas near the Monument may be particularly relevant for those three communities.

The revenue attributed to Massachusetts and Rhode Island from the National Monument is about 0.22% and 0.54% of all revenue, respectively, for these states during 2010-2015 (ACCSP data, 2017). Though these are minor fractions, certain individual permit holders could have as much as 10% of their revenue attributed to fishing from these areas.

Table 4 – Landings revenue to states, regions, and top ports attributed to fishing within the National Monument, 2010-2015 – ALL BOTTOM TENDING GEARS

State/Region/Port	Landings Revenue 2010-2015		Total Permits, 2010-2015[a]
	Total $	Average $	
Massachusetts	$7,316K	$1,219K	285
New Bedford	$6,426K	$1,071K	253
Sandwich	$485K	$81K	3
Gloucester	$241K	$40K	22
Other (n=11)	$164K	$27K	42
Rhode Island	$2,579K	$430K	44
Newport	$1,132K	$189K	6
Point Judith	$578K	$96K	38
Other (n=3)	$869K	$145K	5
Connecticut	$92K	$15K	6
New York	$241K	$46K	6
Montauk	$240K	$40K	5
New Jersey	$278K	$40K	8
Virginia	$67K	$11K	30
Other state(s)[b]	$396K	$66K	16
Total	**$10,969K**	**$1,828K**	**353**

Notes: Ports listed are the top 10 ports by landing revenue that are non-confidential.
[a] Totals may not equal the sum of the parts, because permits can land in multiple ports/states.
[b] Includes confidential state(s).
Source: VTR analysis.

3 References

ASMFC. (2017). Analysis of potential fishery impacts as a result of the NEFMC coral amendment. Memorandum from the American Lobster Technical Committee to the American Lobster Management Board. 26pp.

MAFMC (2008). Amendment 9 to the Atlantic Mackerel, Squid, Butterfish Fishery Management Plan. Includes Final Supplemental Environmental Impact Statement, Preliminary Regulatory Economic Evaluation and Essential Fish Habitat Assessment. 415pp.

MAFMC. (2009). Amendment 1 to the Tilefish Fishery Management Plan. Includes Final Environmental Impact Statement, Preliminary Regulatory Economic Evaluation and Essential Fish Habitat Assessment. 496pp.

NEFMC. (2004). Amendment 2 to the Monkfish Fishery Management Plan, Including a Final Supplemental Environmental Impact Statement. 524pp.

NEFMC. (2017). Deep-sea coral workshops, March 13, 2017 – New Bedford, MA and March 15, 2017 – Portsmouth, NH. Draft Summary Report. 28pp.

Palmer, M. C. and S. E. Wigley (2007). Validating the stock apportionment of commercial fisheries landings using positional data from vessel monitoring systems: 44.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

June 29, 2017

Mr. John Armor, Director
NOAA Office of National Marine Sanctuaries
1305 East-West Hwy, 11th Floor
Silver Spring, MD 20910

Dear Mr. Armor:

Please accept these comments from the New England Fishery Management Council (Council) regarding the candidate National Marine Sanctuary in the waters in and around Hudson Canyon.

The Council has management jurisdiction over 28 marine fishery species in federal waters of the New England region. The distributions of many of these species and the fisheries that harvest them extend beyond New England. Of particular note in this context is the scallop fishery, which is prosecuted inshore of Hudson Canyon, and in other areas of the Mid-Atlantic Bight, Georges Bank, and in the Gulf of Maine. Additional resources managed by the Council and harvested inshore of Hudson Canyon include monkfish and whiting. To understand fisheries uses of Hudson Canyon, we strongly encourage the Office of National Marine Sanctuaries to consult with both the New England and Mid-Atlantic Fishery Management Councils as well as directly with the fishing industry. We are happy to provide specific contacts and suggestions as needed. While the ocean data portals (www.northeastoceandata.org; http://midatlanticocean.org/data-portal/) are extremely useful sources of information about marine uses, these should be taken as a starting point for understanding patterns of fishing effort.

The Council is a steward of the species that we manage and the habitats that support them, and is certainly in support of the research, education, and conservation objectives associated with sanctuaries, including the one proposed here. In fact, we are finalizing an amendment that will provide protection for deep-sea corals as well as other canyon invertebrates and fisheries in the New England region, so we fully understand the ecological value of coral habitats such as those in Hudson Canyon in terms of supporting healthy fisheries. We are aware of the fragility of these habitats. Our Omnibus Essential Fish Habitat Amendment, which is currently undergoing rulemaking, designates a Habitat Area of Particular Concern (HAPC) in Hudson Canyon, on the basis of the area's ecological significance and the potential for human activities to affect the canyon. While the HAPC designation does not carry any fishing restrictions, it is intended to highlight the habitat value of the canyon in terms of consultations on non-fishing projects and their impacts. As you know, there are fishery restrictions in the canyon associated with the Mid-Atlantic Fishery Management Council's Frank R. Lautenberg deep-sea coral protection area, which went into effect this past January.

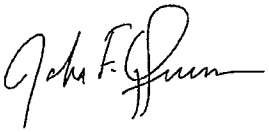
We recognize that this proposal currently has candidate status, and there is a five-year timeframe over which is might be moved into the designation process. We understand that sanctuary designation involves substantial outreach and opportunities for public involvement. However, we remain concerned about the potential for a sanctuary to negatively impact the fishery

management process. While the stated intention of the proponents is that management of fishery resources will remain solely with the Councils and the National Marine Fisheries Service (NMFS), this cannot be guaranteed. Also, we understand that periodic reviews of the designation could change the terms. Even if management is left to the Councils and NMFS via the terms of the designation, as noted by the Mid-Atlantic Fishery Management Council in their April 26 letter, section 304(a)(5) of the National Marine Sanctuaries Act states that the Council's management proposals may not be accepted if the Secretary of Commerce finds that the Council's action "fails to fulfill the purpose and plies of the Act and the goals and objectives of the proposed designation".

New England has a national marine sanctuary located on Stellwagen Bank, and the Council is involved with the Sanctuary as an ex-officio member on the Sanctuary Advisory Council. While the designation letter for Stellwagen Bank National Marine Sanctuary does not grant it management authority over fisheries resources, the Sanctuary often takes positions that attempt to limit commercial and recreational fishing within its boundaries. The Sanctuary has also commented on proposed fishery management actions, causing confusion among our stakeholders as to the opinion of the ultimate reviewer of Council proposals, the Secretary of Commerce. At times, we received conflicting comments from the Sanctuary and our fishery management colleagues at NMFS Greater Atlantic Regional Fisheries Office. Many fishermen believe that the Sanctuary is actively trying to limit their activities in this historic fishing area, despite promises that were made when the Sanctuary was designated.

Fishery management via the Council process is complex and often contentious, but also transparent and inclusive of public participation. We feel that the best approach to fisheries regulation is the Council process, and we are concerned that this process could be compromised if another management entity has authority over fisheries in and around the canyon. We are not prepared to recommend against designation of a National Marine Sanctuary in Hudson Canyon at this time. However, we request that you keep us up to date on any plans to move this candidate proposal into the designation stage, and consult with both of the regional fishery management councils to gain a comprehensive understanding of fisheries in the area.

Sincerely,



Dr. John Quinn
Council Chairman

cc: Mr. Chris Oliver
Dr. Chris Moore, MAFMC

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of National Marine Sanctuaries
1305 East-West Highway
Silver Spring, Maryland 20910

Dr. John Quinn, Chairman
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Dr. Quinn:

Thank you for your letter of June 29, 2017, regarding the nomination of the Hudson Canyon for consideration as a national marine sanctuary. Congratulations to you and the New England Fishery Management Council (NEFMC) for the proposed amendment for deep-sea coral protection in your region and the potential Habitat Area of Particular Concern designation contemplated for the Hudson Canyon. If the canyon were ever designated as a sanctuary, I can envision significant opportunities for partnerships in research, monitoring, education and conservation with both the Mid-Atlantic and New England Fishery Management Councils.

Although NOAA does not have any immediate plans to initiate the national marine sanctuary designation process for this area, should NOAA decide to initiate designation, we would then begin a multi-step, highly participatory public process in direct consultation with stakeholders to evaluate what (if any) additional management measures are needed. This would include close coordination with both Councils as specified in section 304(a)(5) of the National Marine Sanctuaries Act. If no action is taken to begin the designation process within five years, the proposal will be removed from the NOAA inventory of nominations that have successfully met NOAA's national significance criteria and management considerations.

I am also pleased that the NEFMC participates in the Stellwagen Bank National Marine Sanctuary Advisory Council and that Stellwagen Bank National Marine Sanctuary staff have been actively involved with the NEFMC through participation in advisory panels and Council deliberations. These collaborative efforts have provided a healthy exchange of perspectives on the conservation of resources in the sanctuary. I agree that the Council process is transparent and have appreciated the opportunity to participate in it to address matters of mutual concern.

Sincerely,

John Armor
Director

cc: Mr. Chris Oliver, NOAA Fisheries Assistant Administrator
Mr. John Bullard, NOAA Fisheries Greater Atlantic Regional Administrator
Dr. Christopher Moore, Mid-Atlantic Fishery Management Council Executive Director

MB 7/27/17

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

June 29, 2017

The Honorable Ryan Zinke
Secretary
Department of the Interior
1849 C Street, N.W.
Washington, DC 20240

Dear Secretary Zinke:

Please accept these comments from the New England Fishery Management Council (Council) regarding the potential environmental effects of offshore oil development on the Atlantic Outer Continental Shelf.

The Council has management jurisdiction over 28 marine fishery species that are harvested in federal waters of the New England region. The distributions of many of these species and their associated fisheries extend beyond New England, often to Cape Hatteras, NC, and in some cases, into the South Atlantic.

The New England and Mid-Atlantic regions are highly interconnected in terms of fisheries operations and management. For example sea scallops are harvested from Maine to North Carolina and are landed in ports up and down the east coast. Squid are managed by the Mid-Atlantic Fishery Management Council but are harvested in New England as well, and are a key species for Rhode Island ports. The marine fisheries of both regions are economically and socially important to commercial and recreational fishermen and the coastal communities they support.

The National Marine Fisheries Service (NMFS) summarizes the economic impact of both commercial and recreational fisheries on an annual basis, by region.[1] In 2015, landings revenue from commercial fishing totaled $1.2 billion in New England and $512 million in the Mid-Atlantic. The impact on regional economies is of course much larger, through sales of harvested products, personal and proprietor income associated with fishing businesses, and value-added (contribution to regional gross domestic product). NMFS estimates that, excluding the import sector, the New England fisheries economy supports 97,558 jobs, with over $4.8 billion in sales, $1.7 billion in income, and $2.4 billion in value-added. Excluding imports, Mid-Atlantic commercial fisheries support nearly 27,000 jobs, $1.6 billion in sales, $601 million in income, and

[1] National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. DOC, NOAA Tech. Memo. NMFS-F/SPO-170, 247p. http://www.st.nmfs.noaa.gov/Assets/economics/publications/FEUS/FEUS-2015/Report-Chapters/FEUS%202015-AllChapters_Final.pdf

$821 million in value-added. While many other sectors contribute to the economy in both regions, some port communities are particularly dependent on fisheries.[2]

Recreational fisheries are also economically significant during 2015. In New England, the recreational fisheries sector supported over 17,000 jobs, and resulted in sales, income and value-added estimates of $1.8 billion, $801 million, and $1.9 billion, respectively. Recreational fisheries in the Mid-Atlantic are worth nearly twice those in New England, supporting over 37,000 jobs, sales over $4 billion, income of $1.7 billion, and value-added of nearly $2.7 billion. The number of recreational trips taken during 2015 was estimated at 17 million; 5 million in New England and 12 million in the Mid-Atlantic.

The New England Council is a steward of many of the species that support these fisheries, and is very concerned that oil and gas exploration and extraction activities may harm these resources and the communities that depend on them. In the near term, we are very concerned that noise generated by seismic surveys will negatively impact not only fishery resources but other animals that are part of the marine ecosystem, including large whales. Aquatic animals used sound to "select mates, find food, maintain group structure and relationships, avoid predators, navigate, and perform other critical life functions"[3]. Paxton et al. (2017)[4] estimated fish abundance at a rocky, shallow reef off the North Carolina coast, prior to and during a seismic survey. Received noise intensities at the reef, which was 7.9 km from the closest approach of the seismic survey vessel, were estimated to be in the range of 181-220 dB re 1μ Pa, above the 207 dB re 1μ Pa threshold estimated to cause recoverable and potentially lethal injuries[5]. In contrast to the three days prior to the seismic survey, heavy evening usage of the reef during the survey was significantly reduced. At the bottom of the marine food chain, there is new evidence that zooplankton, including krill, an important prey species, can suffer significant mortality associated with airgun use. McCauley et al. (2017) [6] observed reduced abundance of zooplankton 1.0-1.2 km from an experimental seismic transect. Extrapolating from these findings, the authors suggested that "significant depletion or modification of plankton community structure" could result from commercial seismic operations, given the much broader spatial and temporal scale of such surveys.

While we recognize the importance of domestic energy development and energy security to the U.S. economy, such development must be done in a way that minimizes risks to marine species. At present, there is insufficient information about how ocean noise may affect fish, marine mammals, benthic communities, and ecosystem structure and function. There are just a few in situ field studies of fish or zooplankton responses to these types of noise from which to estimate the potential ecosystem effects of seismic surveys. Given the existing value of living marine resources and fisheries along the coast, it is critical to fund additional research into the environmental

---

[2] NMFS Social Indicators website: http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/

[3] Gedamke, J., et al. 2016. National Oceanic and Atmospheric Administration's Ocean Noise Strategy Roadmap. http://cetsound.noaa.gov/road-map

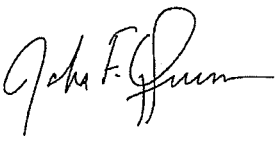
[4] Paxton, A.B., et al. 2017. Seismic survey noise disrupted fish use of a temperate reef. Marine Policy 78: 68-73.

[5] Popper, A.N., et al. 2014. Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-accredited Standards Committee S3/SC1 and registered with ANSI. Springer Briefs in Oceanography, ASA Press and Springer. 60pp/

[6] McCauley, R.D., et al. 2017. Widely used marine seismic survey air gun operations negatively impact zooplankton. Nature Ecology & Evolution 1, 0195. 8pp.

consequences of these activities, before they are permitted. We look forward to working with the Department of the Interior and its Bureau of Ocean Energy management to ensure responsible development of domestic energy resources in the Atlantic.

Sincerely,



Dr. John Quinn
Council Chairman

cc: Wilbur Ross, Secretary, Department of Commerce
Chris Oliver, Assistant Administrator for NOAA Fisheries
Donna Wieting, Director, NOAA Office of Protected Resources
Patricia Montanio, Director, NOAA Office of Habitat Conservation
Walter Cruikshank, Acting Director of BOEM
Timothy Williams, Office of External and Intergovernmental Affairs, Department of Interior

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 15, 2017

Ms. Kelly Hammerle
National Program Manager, BOEM
45600 Woodland Road, Mailstop VAM-LD
Sterling, VA 20166

Dear Ms. Hammerle:

Please accept these comments from the New England Fishery Management Council (Council) regarding the preparation of a new five-year National Outer Continental Shelf Oil and Gas Leasing Program for 2019-2024.

On June 29, in the context of the near-term potential for seismic exploration in the Mid- and South Atlantic regions, we sent a letter[1] to Secretary Zinke expressing our concerns regarding the potential ecological impacts of such surveys, and urging further study of potential impacts before such surveys are allowed. As we mentioned in our letter, commercial and recreational fisheries are important economic drivers in the North, Mid-, and South Atlantic, and the three Atlantic coast regions are highly interconnected in terms of commercial fisheries and fisheries management structures. The Council has management jurisdiction over 28 marine fishery species[2], and we are very concerned that oil and gas exploration and extraction activities may harm these resources and the communities that depend on them. Many of these species and their associated fisheries extend beyond New England, often into the Mid-Atlantic, and in some cases, into the South Atlantic. New England Council-managed fisheries overlap the North and Mid-Atlantic Planning Areas.

While we recognize the importance of domestic energy development and energy security to the U.S. economy, we urge caution as the agency considers whether to include planning areas in the Atlantic OCS in the 2019-2024 five-year plan. The commercial and recreational fishing industries provide significant benefits to the nation, including contributions to our nation's food security. As the world's population continues to increase, this will grow in importance. If we are to realize the benefits of these activities into the future, energy development must minimize risks to marine species and existing human uses.

Our concerns regarding oil and gas development fall into five categories. First, we are concerned about direct displacement of fishing activities due to survey or extraction activities occurring in offshore environments. Second, there are sensitive, deep-water benthic habitats in the Atlantic OCS that overlap strongly with hydrocarbon assessment units. These habitats, which are essential to many deep-sea species as well as some commercially-exploited stocks could be

[1] See attachment
[2] Atlantic cod, haddock, pollock, white hake, Acadian redfish, Atlantic wolffish, ocean pout, Atlantic halibut, winter flounder, American plaice, witch flounder, windowpane flounder, yellowtail flounder, monkfish, winter skate, little skate, smooth skate, thorny skate, barndoor skate, rosette skate, clearnose skate, silver hake, red hake, offshore hake, Atlantic herring, Atlantic sea scallop, Atlantic salmon, Atlantic deep-sea red crab

negatively impacted by extraction activities. Third, as mentioned in our prior letter, we are concerned that sounds produced by oil and gas surveys and drilling operations will have negative impacts on living marine resources, and that changes in distribution or abundance of these resources will in turn affect fishing operations. Fourth, infrastructure development to support an Atlantic oil and gas industry could have negative impacts on nearshore fish habitats which must be fully considered. Finally, there is a risk of leaks and spills associated with oil and gas extraction and transport. Such spills would have negative impacts on marine ecosystems, and cascading effects on human activities.

Survey and extraction activities could directly displace fishing vessels. We have reviewed the Inventory of Technically and Economically Recoverable Hydrocarbon Resources of the Atlantic Outer Continental Shelf as of January 1, 2014 (BOEM 2016). Some of the North and Mid-Atlantic Assessment Units (AU) have a strong spatial overlap with important fishing grounds, and others lie just offshore of these grounds (Figure 1). The Triassic-Jurassic Rift Basin AU and Cretaceous & Jurassic Hydrothermal Dolomite AU encompass much of the U.S. portion of Georges Bank. Georges Bank is a shallow submarine plateau that interacts with regional ocean currents to generate strong areas of upwelling, which leads to the high primary production that supports the food chain of the bank, and in turn, commercial fisheries. Eastern Georges Bank is an important fishing area for groundfish, scallops, and lobster. The Atlantic Sea Scallop fishery has revenues of nearly half a billion dollars per year, and eastern Georges Bank is a core fishing ground for this fleet. Some fishing operations might not be economically viable if forced to move to less productive or more distant fishing grounds.

Along the continental shelf break, the Jurassic Shelf Stratigraphic AU and Late Jurassic-Early Cretaceous Carbonate Margin AU overlap fishing grounds for whiting, squid, red crab, lobster, Jonah crab, monkfish, butterfish, and tilefish. We manage some of these fisheries, and others are managed by our partners, the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission. Highly migratory fishes and marine mammals are also abundant along the shelf break. Surveys or drilling activities in these AUs could directly displace fishing activities. If the five-year plan authorizes leasing in any portions of the Atlantic OCS, it is imperative that BOEM become familiar with the seasonal movements of marine resources and their target fisheries in our region, so that survey and construction activities can be conducted in ways that minimize interactions. We have found through our own work that it is critical to review fisheries data for multi-year periods, as management changes and natural inter-annual fluctuations in stock conditions lead to different levels of activity between years.

We are also concerned about the effects of extraction activities on fish habitats. The above-mentioned AUs along the shelf break, in addition to the Cretaceous and Jurassic Interior Shelf Structure AU and the Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU, overlap deep-sea coral habitat that occur in both the canyons and on the open slope. Deep-sea corals are fragile and very slow growing, such that recovery from anthropogenic impacts, whether due to fishing, oil and gas exploration, or another activity, will likely be extremely slow. These corals, in combination with other benthic animals such as sponges, provide habitats for fishes and marine invertebrates, with some very specific interactions between species. In addition to these deep sea habitats, the shallower AUs on the bank overlap the northern edge, which is an area of concern for juvenile Atlantic cod (shaded blue in Figure 2).

While we still have much to learn about deep-sea coral ecology, recent (2013-present) NOAA studies have thoroughly documented coral occurrence within all surveyed canyons, many intercanyon slope areas, and at a range of depths, from the edge of the EEZ near Heezen Canyon south to Norfolk Canyon. Corals also occur on the New England seamounts, of which Bear and

Physalia Seamounts overlap the deepest hydrocarbon assessment units (Cenozoic-Cretaceous & Jurassic Paleo Slope Siliclastic AU and Cenozoic-Cretaceous & Jurassic Paleo Slope Siliclastic Extension AU).

All three Atlantic coast regional fishery management councils have designated areas to highlight important coral habitats and restrict fishing from these areas to protect them from damage. The Council is in the process of finalizing a plan to restrict certain types of bottom-contact fishing from the shelf break out to the EEZ boundary (NEFMC 2017, some of these areas are shown in red on Figure 2). In addition, through our Omnibus Essential Fish Habitat Amendment (NEFMC 2015, currently under NMFS review), we have designated Habitat Areas of Particular Concern in 11 canyons and canyon complexes from Heezen to Norfolk (blue shaded areas in Figure 2). Although there are no fishing restrictions associated with the Habitat Areas of Particular Concern, the designations highlight the ecological importance of these canyons, and serve as a starting point for further consideration of fishery management measures, and as a focus for the evaluation of non-fishing activities. In light of the sensitive habitat types present in the canyons along the Atlantic continental margin, we agree that the previous administration's withdrawal of the major canyons from oil and gas exploration and development was an appropriate, precautionary choice, and we would hope to see these withdrawals reinstated, if leasing is permitted in the North and Mid-Atlantic Planning Areas under the 2019-2024 plan.

We are concerned that sounds produced by oil and gas surveys and drilling operations will have negative impacts on living marine resources. Human-generated, low-frequency noise in the marine environment has doubled every decade for the period 1950 to 2000 (Hildebrand 2009), a substantial change has occurred within the lifetimes of some longer-lived species. Oil and gas extraction activities generate various types of sounds, including explosions, vessel noise, survey air gun blasts, and pile driving during construction of nearshore and offshore facilities (Hawkins et al. 2015). As BOEM is aware, the science on the effects of these sounds on living marine resources is not conclusive, and there are many gaps in our collective knowledge (Hawkins et al. 2015, which builds on a 2012 BOEM workshop summarized by Normandeau 2012). However, scientific uncertainty in the magnitude of and biological mechanisms behind these impacts should not be used as a rationale for downplaying this issue in either impacts assessment or decision making.

Impacts of sound on marine fishes are difficult to assess, in part due to the logistics of conducting such studies, but also because effects vary according to both the species and the characteristics of the sound, which may in turn vary according to environmental characteristics such as temperature (Popper and Hastings 2009). Further limiting our ability to generalize about effects across different fishes and types of noise, in some studies (e.g. Popper et al. 2007, Wysocki et al. 2007), different cohorts of the same species exhibit varying responses to sound exposure, perhaps due to developmental history or genetic differences (Popper and Hastings 2009). These challenges in assessment extend to marine mammals and invertebrates as well. Because it is difficult to extrapolate the results of existing studies to species and sound types not specifically examined (Popper and Hastings 2009, Hawkins et al. 2015), BOEM should be very precautionary when authorizing sound generating activities, and should encourage additional research that is regionally-specific.

It is easy to appreciate the logistical difficulties of tracking the long-term effects of sound exposure on specific populations of animals in the field, but such challenges should not preclude a rigorous attempt to estimate long-term and cumulative effects. The research we have reviewed has generally focused on assessing individuals or populations shortly before, during, and after exposure to sounds from air guns or pile driving, and we understand that these types of studies

are most typical. Ideally, it would be possible to expand upon the results of such studies to determine the population-level effects of exposure on fisheries stocks, protected and endangered species, and ecosystem component species. Although such assessments may not be possible in the short term, we encourage BOEM to consider the potential cumulative and long-term effects of sound exposure at population levels when drafting the five-year plan, even if such an assessment is largely qualitative.

Even if population-level effects of sound cannot be estimated, either for fishery resources or for other species they depend on for food, localized movement of fish within the water column or out of the immediate area may still affect commercial fleets targeting those resources. A variety of studies have documented localized movement of fisheries stocks following sound exposure (e.g. Fewtrell and McCauley 2012, Paxton et al. 2017). Localized declines in abundance or availability of fish could negatively affect fishing fleets in the absence of a population-level or long-term effect on the resource.

Our concerns about negative effects on fish habitats are not limited to offshore areas. While the harvest of federally-managed fishes and invertebrates generally occurs outside the coastal zone, many of the species we manage begin their lives in nearshore habitats. Although the hydrocarbon assessment units occur offshore, oil and gas resources extracted from the seabed will need to come onshore for refining and distribution. If new onshore or nearshore infrastructure is needed to support oil and gas development of the Atlantic OCS, construction activities could impact nearshore habitats. NMFS Office of Habitat Conservation has substantial expertise in mitigating these types of impacts. The new five-year plan should explore the extent to which infrastructure development might be necessary for Atlantic oil and gas development, and consider the cumulative effects of such construction on managed species and their habitats. We encourage BOEM to work closely with NMFS to evaluate and mitigate, when necessary, impacts of development on both nearshore and offshore marine habitats.

Finally, an attendant risk with hydrocarbon development, unlike with renewable energy development, is the possibility of a spill or blowout. The extensive body of scientific literature resulting from the work done after the 2010 Deepwater Horizon spill documents a broad range of impacts on the species and associated human communities of the Gulf of Mexico (see Murawski et al. 2016 for summary). While we acknowledge such events are rare, they are possible, and should be evaluated in the new five-year plan as a potential impact of oil and gas development. Weather conditions in the northwestern Atlantic can be extreme in terms of both wind speeds and waves. Such conditions would increase the risk of spills during oil transport and drilling as compared to some other regions of the United States.

Given the above concerns, we believe that hydrocarbon development in the Atlantic OCS inappropriately risks living marine resources and associated human communities, and we recommend that BOEM exclude the Atlantic planning areas from the 2019-2024 plan. We think that renewable energy development is a better focus area for the Atlantic coast at this time. While wind and other renewable projects may still have impacts on fisheries, the risks appear to be fewer. The Gulf of Maine is one of the fastest warming bodies of water on the planet, and we are already seeing evidence of changes in the Northeast Shelf Ecosystem[3]. Actions to prioritize renewable energy and decrease reliance on non-renewable resources will reduce the risk of negative ecological impacts on our ocean resources, and thereby support the human communities that depend on them.

---

[3] See https://www.nefsc.noaa.gov/ecosys/current-conditions/ for a detailed condition report for the Northeast Shelf Ecosystem.

We look forward to working with the Department of the Interior and its Bureau of Ocean Energy management to ensure responsible development of domestic energy resources on the Atlantic OCS.

Sincerely,

Dr. John Quinn
Chairman

cc: Robert Beal, ASMFC
Dr. Chris Moore, MAFMC
Lou Chiarella, GARFO Habitat Conservation

Attachment – June 29, 2017 Letter from NEFMC to Ryan Zinke

References

BOEM (2016). Inventory of Technically and Economically Recoverable Hydrocarbon Resources of the Atlantic Outer Continental Shelf as of January 1, 2014. OCS Report BOEM 2016-071. 58.

Fewtrell, J. L. and R. D. McCauley (2012). "Impact of air gun noise on the behaviour of marine fish and squid." Marine Pollution Bulletin 64(5): 984-993.

Hawkins, A. D., A. E. Pembroke and A. N. Popper (2015). "Information gaps in understanding the effects of noise on fishes and invertebrates." Reviews in Fish Biology and Fisheries 25(1): 39-64.

Hildebrand, J. A. (2009). "Anthropogenic and natural sources of ambient noise in the ocean." Marine Ecology Progress Series **395**: 5-20.

Murawski, S. A., J. W. Fleeger, W. F. I. Patterson, C. Hu, K. Daly, I. Romero and G. A. Toro-Farmer (2016). "How Did the Deepwater Horizon Oil Spill Affect Coastal and Continental Shelf Ecosystems of the Gulf of Mexico?" Oceanography **29**(3): 160-173.

NEFMC (2015). Omnibus Essential Fish Habitat Amendment 2, Including Draft Final Environmental Impact Statement and Regulatory Impact Review. Volumes I-VI plus appendices. Available at http://www.nefmc.org/library/omnibus-habitat-amendment-2.

NEFMC (2017). Draft Omnibus Deep-Sea Coral Amendment, Including a Draft Environmental Assessment. Available at http://www.nefmc.org/library/omnibus-deep-sea-coral-amendment

Normandeau Associates, I. (2012). Effects of Noise on Fish, Fisheries, and Invertebrates in the U.S. Atlantic and Arctic from Energy Industry Sound-Generating Activities. A Workshop Report for the U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Contract # M11PC00031: 72.

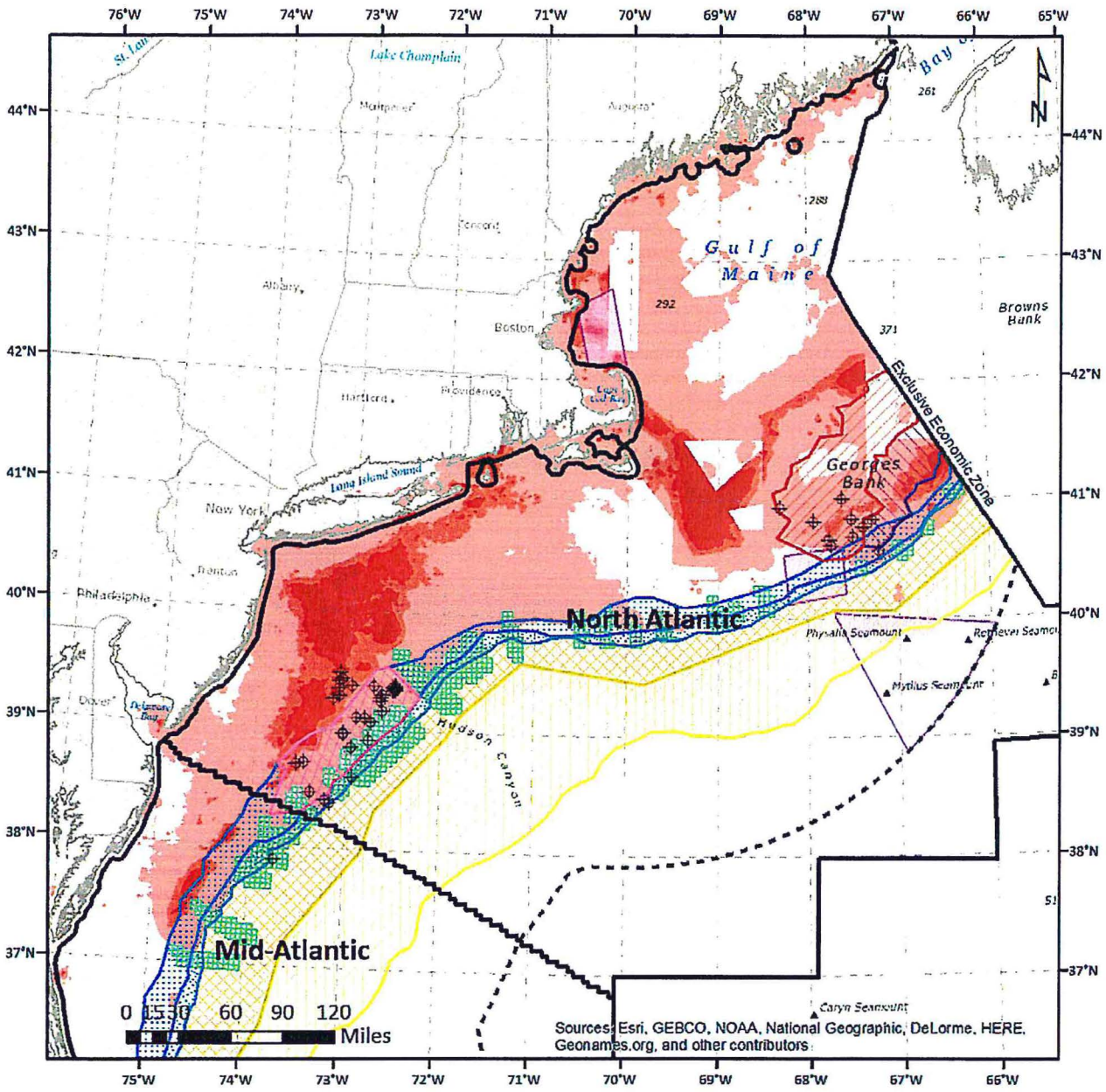
Paxton, A. B., J. C. Taylor, D. P. Nowacek, J. Dale, E. Cole, C. M. Voss and C. H. Peterson (2017). "Seismic survey noise disrupted fish use of a temperate reef." Marine Policy 78: 68-73.

Popper, A. N. and M. C. Hastings (2009). "The effects of human-generated sound on fish." Integrative Zoology 4(1): 43-52.

Popper, A. N., Halvorsen, M. B., Kane, A., Miller, D. L., Smith, M. E., Song, J., Stein, P., Wysocki, L. E. (2007). The effects of high-intensity, low-frequency active sonar on rainbow trout. J. Acoust. Soc. Amer. **122**: 623-635.

Wysocki, L. E., Davidson, J. W. III, Smith, M. E., et al. (2007). Effects of aquaculture production noise on hearing, growth, and disease resistance of rainbow trout *Oncorhynchus mykiss*. Aquaculture 272: 687-97.

Figure 1 – Fishery revenues, Planning Areas and Assessment Units, and Past and Current Withdraw Areas



Assessment Units

- Triassic-Jurassic Rift Basin AU
- Cretaceous & Jurassic Hydrothermal Dolomite AU
- Cretaceous & Jurassic Interior Shelf Structure AU
- Jurassic Shelf Stratigraphic AU
- Late Jurassic-Early Cretaceous Carbonate Margin AU
- Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Core AU
- Cenozoic-Cretaceous & Jurassic Paleo-Slope Siliclastic Extension AU
- Cenozoic-Cretaceous & Jurassic Carolina Trough Salt Basin AU
- Cretaceous & Jurassic Marginal Fault Belt AU
- Cretaceous & Jurassic Interior Shelf Structure AU

- Atlantic wells
- Planning areas
- Atlantic Region Withdraw Areas
- Canyon Withdrawl (rescinded by April 2017 EO)

Sum of commercial fishery revenue 2010-2014

$ per 500x500 m grid

- 590 - 1300
- 1400 - 7800
- 7900 - 14000
- 15000 - 21000
- 22000 - 150000

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 23, 2017

Naval Facilities Engineering Command, Atlantic
Attention: AFTT EIS/OEIS Project Manager
Code: EV22KP
6506 Hampton Boulevard
Norfolk, Virginia, 23508-1278

To whom it may concern:

Please accept these comments from the New England Fishery Management Council (Council) regarding the Atlantic Fleet Training and Testing Phase III EIS/OEIS (EIS). The purpose of this comment letter is to highlight specific concerns about assumptions and conclusions in the EIS related to Naval training and testing and their potential interactions with fisheries, fishery resources, and fish habitats. Our comments focus on sections of the draft EIS most relevant to fisheries management, namely the affected environment and description of impacts for invertebrates, fishes, and socioeconomics.

The Council is responsible for the management of fishing activities in federal waters off New England (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut), in collaboration with the National Marine Fisheries Service, Mid-Atlantic Fishery Management Council, and Atlantic States Marine Fisheries Commission. While certain fisheries we manage are prosecuted mainly in New England waters (for example, groundfish, herring, and skates), others occur as far south as the Virginia/North Carolina border (Atlantic sea scallop, red crab). In general, the fishing grounds and fish habitats we manage align spatially with the Navy's Northeast Range Complexes.

Section 3.04: Invertebrates

The Council manages two invertebrate fisheries (Atlantic sea scallop and Atlantic deep-sea red crab) and marine invertebrates serve as habitat for target and non-target living marine resources that comprise the northeast shelf ecosystem. The American lobster, shortfin squid, longfin squid, ocean quahog, and Atlantic surfclam are the foundation of valuable fisheries prosecuted in New England but are managed by other authorities. The Council manages deep-sea coral as well, and is working to minimize fishery impacts to these invertebrate species, not only in recognition of the coral's inherent vulnerability and existence value, but also because these animals create biogenic habitat used by target fishery resources.

In section 3.04, the EIS includes reference to diverse and abundant arthropod and mollusk assemblages on the continental shelf. The Atlantic sea scallop is notably absent from the list of species on page 3.4-4, but can be quite abundant in certain habitat types, namely areas with sand and gravel sediments and depths of 18-110 meters. As documented in section 3.11 of the EIS, the sea scallop supports a very valuable fishery worth roughly half a billion dollars per year, ex-vessel. Many scallop beds are outside the Navy's OPAREAs, but the southern part of the Boston OPAREA and portions of the Narragansett Bay OPAREA are important fishing grounds for both larger (offshore) and smaller (day boat) vessels. Localized concentrations of scallops also occur in the inshore Gulf of Maine, within both sections of the Boston OPAREA. We recommend that the Navy become familiar with the locations of scallop beds and avoid activities that might impact the seabed in these areas.

While we agree with the finding in the EIS that overall impacts of training and testing on deep-sea corals are likely to be minimal, the sensitive nature of these habitats warrants very deliberate and specific avoidance of these areas during training and testing. Exploding munitions could damage corals. As noted in the EIS, most offshore detonations are expected to occur at the surface. While this makes interactions unlikely, any interactions that do occur could cause significant damage to habitat types with very long recovery times. We agree with the assessment in the EIS that a blast in the vicinity of stony corals (as well as soft and black corals) could be very damaging. Given the growth rates of some species, the 5-10 year recovery period given as an example is likely a substantial underestimate of the recovery time of these habitats. A multi-decade timescale as referenced in section 3.4.3.4 is likely more appropriate for either explosions or physical disturbances/strikes.

The description of deep-sea coral habitats on page 3.4-6 seems to better reflect southeastern U.S. coral habitats vs. those of the Mid-Atlantic and New England. In our region, reef building species such as *Oculina* and *Lophelia* are less common, and non-reef-building soft, stony, and black corals are more typical, with soft corals most common at shallower sites. Dense aggregations of coral colonies have been documented at some sites. Recent (2013-present) surveys have documented corals in all major and minor canyons off Georges Bank and the Mid-Atlantic Bight, on all seamounts in the U.S. EEZ, and in particular locations in the Gulf of Maine. Deep-sea corals in the canyons that incise the shelf break along Georges Bank and the Mid-Atlantic Bight tend to occur in depths of at least 200 m, typically deeper, extending into the deepest parts of the canyons below 2,000 m. Corals also occur on the summits and sides of seamounts. In the inshore Gulf of Maine, deep-sea corals occur on Outer Schoodic Ridge and west of Mt. Desert Rock, areas approximately 20-25 nm from the eastern Maine coast. Coral habitats are also found in Jordan Basin and Georges Basin, but these areas appear to be offshore of the Boston OPAREA.

We encourage the Navy to become familiar with the distribution of deep-sea corals, and avoid overlaps with these sensitive habitats during training and testing. The habitat suitability modeling referenced in the technical report "Building and Maintaining a Comprehensive Database and Prioritization Scheme for Overlapping Habitat Data - Focus on Abiotic Substrate" is useful for estimating the approximate footprint of coral habitats in the canyons, but the spatial domain of the model does not encompass all of the seamounts within the EEZ, and the model does not identify high suitability habitats in the Gulf of Maine, likely due to low resolution seabed data

underlying the analysis in that part of the region. Coral distributions in the New England and Mid-Atlantic regions are well documented in recent plan amendments/environmental assessments developed by the Mid-Atlantic and New England Fishery Management Councils, and we would be happy to provide the Navy with specific information based on our recent work. NMFS, a collaborating agency on the EIS, has substantial expertise in this area and is the source of most of our coral data.

We were pleased to note that recently discovered cold seep habitats are identified as occurring in the affected environment for this action (page 3.4-7). As far as we are aware, these cold seeps occur beyond water depths commercially fished, but we would nonetheless recommend avoiding impacts to known seep habitats to the extent possible, given that they are little studied but may be ecologically important.

Section 3.06: Fishes

The Council is concerned about the direct and indirect impacts of acoustic activities, including sonar and explosions, on marine mammals, fishes, and invertebrates. While the Council does not have responsibility for managing marine mammal species (section 3.07 of EIS), we recognize the role of these species in the ecosystem, and support mitigation measures to protect marine mammals in specific areas, namely the Northeast Planning Awareness Mitigation Areas and Mid-Atlantic Planning Awareness Mitigation Areas. In such areas, we understand that the Navy will avoid planning major training exercises to the maximum extent practicable and will not conduct more than four major training exercises per year (all or a portion of the exercise).

The Council is also concerned about residual from training materials (explosives, explosives byproducts, unexploded munitions, metals, and toxic expended material components) to habitats and fishes. In order to protect fishes and their habitats, as well as fishermen who may encounter training materials, we support the Navy's attempts to remove as many of these materials as possible following training and testing.

Overall, we agree with the conclusions in section 3.06 of the EIS that overall impacts to fishes will be minimal, despite the potential for spatially localized effects at certain sites, or individual fish mortality events. However, the EIS notes that explosions and acoustic impacts have greater potential to negatively affect fishes with swim bladders. Atlantic cod is a species that has a swim bladder, occurs in nearshore habitats where testing and training activities are most likely, and is currently at very low levels of abundance, based on fisheries stock assessments. We encourage the Navy to avoid testing and training activities that could negatively impact benthic fishes in habitats known to be important to Atlantic cod.

Section 3.11: Socioeconomics

In section 3.11, socioeconomics, we focused our review on commercial and recreational fishing impacts. However, we note that the affected environment of the study area could change with respect to oil and gas leasing and development over the next few years, depending on the outcome of BOEM's 5-year oil and gas planning process that will replace the 2017-2022 plan currently in effect. In addition, the Navy is likely aware, and the EIS should probably reflect, that

specific offshore windfarms are actively moving forward with site assessment activities and drafting construction and operations plans. Given these specific activities, the reference to the Smart from the Start wind energy development plans in the EIS seems overly general.

In general, we recommend that the Navy should work to ensure that training and testing activities are isolated from other activities, including fishing. With respect to fishing activity, the summary provided in section 3.11.2.4 is a good overview of commercial and recreational fishing in the Atlantic and Gulf regions, but would benefit from additional specifics. In the New England and Mid-Atlantic regions, fisheries are prosecuted from shore to the shelf break and continental slope. Both fishing activity and Navy testing and training activities are spatially concentrated within these large regions. It would be helpful to include an assessment of the likely spatial overlap between specific types of fishing activities with the locations where training and testing activities are likely to be concentrated. Fishing activities could be grouped by target species, fishery management plan, or gear type. Such an analysis would not need to be overly specific to be useful; as both fishing activities and Naval testing and training are somewhat difficult to forecast precisely, this would be challenging in any case. Fishing effort maps are available on regional ocean data portals such as http://www.northeastoceandata.org/ and http://portal.midatlanticocean.org/.

In the assessment of environmental consequences, the EIS mentions that "the opportunities for Navy activities to interfere with commercial and recreational fishing are minimal because the majority of fishing would occur closer to shore" (section 3.11.3.1.1.4). This conclusion is repeated in section 3.11.3.3.1.4, which states that the majority of commercial and recreational fishing activity occurs in state waters. While we agree that nearshore areas are important fishing grounds, particularly for recreational anglers, these statements are inaccurate with regards to commercial fishing, at least in terms of volume of fish landed and value of the catch. A more rigorous analysis of potential spatial overlaps would help specify these statements, and improve the assessment of environmental consequences. We agree that fishing vessel activity is often concentrated within approximately 30-40 nm from shore, which minimizes steam time and fuel usage, and reduces the costs of fishing. These are similar to the logistical reasons given for the location of the Navy's training and testing activities, i.e. reduced costs, proximity to onshore facilities, and shorter deployment times for personnel.

As noted above, we are also concerned about the possible retrieval of unexploded munitions by fishing vessels. While such occurrences are rare, they could have very significant consequences for those involved. The Navy should work with the Coast Guard and others to ensure that all mariners are aware of areas where munitions may be encountered, and that they know what to do if retrieval occurs. We would be happy to work with the Navy to help disseminate such information to our constituents.

Conclusion

Overall, we found the Navy's EIS to be a thorough description of possible training and testing activities, and a detailed treatment of the potential effects of such activities on the valued ecosystem components assessed. However, the document could benefit from additional detail in the areas noted above.

Fishing and military activities have been coexisting along the Atlantic coast for many years, and will certainly continue to do so. We look forward to working with the Navy to minimize the effects of these activities on marine fisheries. Please contact me if you have questions about these comments, or if you need more information about New England fishery management plans or fishing activities.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

cc: MAFMC
ASMFC
GARFO HCD

ecology and environment, inc.
Global Environmental Specialists

90 Broad Street, Suite 1906
New York, New York 10004
Tel: (212) 742-1713, Fax: (212) 742-1718

August 1, 2017

Tom Nies
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Re: Offshore Wind Master Plan
New York State Energy Research and Development Authority
Information Request

Dear Mr. Nies:

Ecology and Environment, Inc. (E & E) is supporting New York State Energy Research and Development Authority (NYSERDA) in its development of an Offshore Wind Master Plan to help meet the state's Clean Energy Standard renewable energy mandate and to ensure that offshore wind in New York is developed in the most responsible and cost-effective manner possible. The Master Plan will identify potential offshore wind sites within the Offshore Study Area (OSA) [Attachment A] that meet the State's siting standards and take into consideration environmental, maritime, social, economic, and indigenous issues.

As part of the master planning process, NYSERDA is identifying reasonably foreseeable activities occurring in and near the OSA that may have impacts similar to construction and operation of offshore wind farms. E & E is requesting the following information:

- A copy of the New England Fishery Management Council Comprehensive Plan, as applicable;
- A list of planned offshore New England Fishery Management Council development projects within 5 miles of the OSA;
- For each planned offshore development project, the status of permitting (i.e., whether approved or under review by the local municipality), the timeframe for development and start of construction;
- A list of planned coastal development projects in the vicinity of the OSA;
- For each planned coastal development project, the status of permitting (i.e., whether approved or under review by the local municipality), the timeframe for development and start of construction;

We recognize that we are requesting information that may come from multiple departments, divisions, or offices, and are therefore willing to coordinate directly with the appropriate contact person. If there are other persons within that would have this information, please provide their contact information. We can also provide shapefiles to use in geographic information system (GIS) programs or a KMZ file to use in GoogleEarth via email upon request, if that would assist your review.

MB, CK 8/8/17

If you have any questions regarding this correspondence and information request, or require additional information, please do not hesitate to contact me at (201) 850-3690, or via email at kohleth@ene.com. We appreciate your assistance and thank you for your attention to this request.

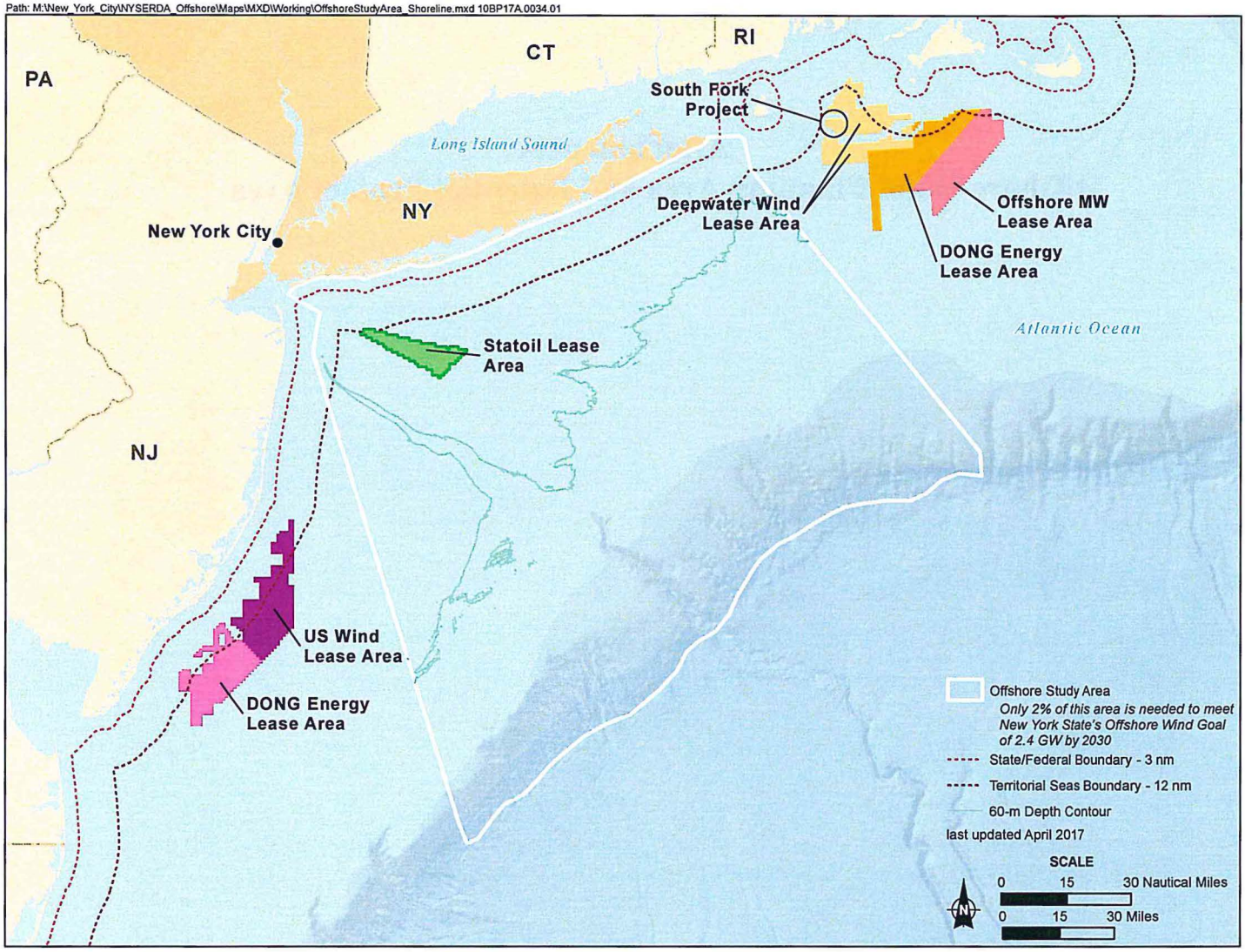
Sincerely,

Kris Ohleth
Project Manager

ECOLOGY & ENVIRONMENT, INC.

Attachment: Attachment A - New York Offshore Study Area

Path: M:\New_York_City\NYSERDA_Offshore\Maps\MXD\Working\OffshoreStudyArea_Shoreline.mxd 10BP17A.0034.01



Attachment A
Offshore Wind Planning Area and Potential Project Area

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 18, 2017

Kris Ohleth
Project Manager
Ecology & Environment, Inc.
90 Broad Street, Suite 1906
New York, NY 10004

Dear Mr. Ohleth:

Thank you for contacting us to determine if we are developing projects with impacts similar to offshore wind farms. We agree that comprehensive planning and assessment of cumulative effects is an important step in the development of of New York's Offshore Wind Master Plan.

The New England Fishery Management Council (Council) is a non-federal entity authorized by the Magnuson Stevens Fishery Conservation and Management Act to develop fishery management plans for resources harvested in federal waters off New England. These plans do not include construction or development of marine infrastructure, so we cannot provide any specific information in response to your request. Rather, the plans involve setting annual catch limits for specific living marine resources, and ensuring that those limits are achieved. Typical plan measures include caps on the numbers of permits in a fishery, trip-based catch limits, restrictions on gear, measures to reduce bycatch and protect depleted stocks, and spatial fishery closures to protect fish habitats or spawning activities. We collaborate closely with the National Marine Fisheries Service (NMFS) to develop and implement our fishery management plans.

NMFS and the Council have responsibilities to identify and protect essential fish habitats. A core function of NMFS' Habitat Conservation Division is to consult with those applying for federal permits in marine and coastal environments, including permits related to offshore wind facilities. The purpose of these consultations is to recommend habitat conservation measures that will minimize impacts to fishery species and other marine resources. We encourage you and NYSERDA to contact NMFS Habitat Conservation Division as you develop the Master Plan.

Should the need arise, we would be happy to provide E & E or NYSERDA with our input on environmental, social, and economic questions related to fisheries management that may arise during development of the Master Plan. The Offshore Study Area includes important fishing grounds and fish habitats.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 29, 2017

Mr. Gregory Lampman
Program Manager, Environmental Research
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

Dear Mr. Lampman:

Thank you for the opportunity to comment on NYSERDA's Fish and Fisheries Study to support the Offshore Wind Master Plan. Our detailed comments are provided on the review tracking form as requested.

As we are also involved in environmental reviews, we can certainly appreciate the need to develop these studies quickly, but I want to reiterate the comment I made to Stephen Drew last week. The timeline for this review was very aggressive and challenging for my staff to accommodate. More advanced notice of the comment period or a longer number of days with the document would have been helpful.

During the August 28 webinar, you indicated that Section 6 of the study (Stakeholder feedback) would be available mid-September. We would appreciate seeing a copy of that section of the draft report when it is ready.

The New England Fishery Management Council is eager to engage with offshore wind planning agencies and developers on behalf of the federal fisheries management stakeholders who participate in our process. Please continue to keep us informed as NYSERDA's master plan development proceeds.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

Enclosure

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

Offshore Wind Studies – Review Tracking Form

NYSERDA respectfully requests that you use this tracking form when providing comments on each of the Offshore Wind Master Plan Studies. This will help us to address your comments more accurately and expediently. Please feel free to add or delete rows/sheets to accommodate the appropriate number of comments for your review. Thank you in advance for your participation.

Study Name: Fish and Fisheries

Organization Name: New England Fishery Management Council – contact Michelle Bachman (mbachman@nefmc.org)

Comment Number	Page # and Line # (from Study)	Comment(s)
1.	7, lines 28-29	There are boundary lines between the various fishery management councils, and we agree that the OSA is part of the Mid-Atlantic Council region. However, these boundaries are rarely referenced (with the possible exception of recent deep-sea coral management actions by both Councils), and a more useful way to consider which Council's feedback is relevant to any given issue is by evaluating which managed fisheries overlap the OSA. The Councils do not really manage specific regions of the ocean, rather, we manage commercial and recreational fisheries for specific living resources.
2.	10, lines 6-12	NEFMC manages groundfish (also called northeast multispecies or large mesh multispecies) as well. Spiny dogfish is jointly managed with MAFMC as the lead. NEFMC has the lead for monkfish.
3.	13, lines 17-18	Gorgonians are a type of deep-sea coral. Deep-sea corals are rare on the shelf in waters shallower than 200 m, but occur in the canyons, including in Hudson Canyon, and on the continental slope. We agree that deep-sea corals are important providers of fish habitat.
4.	14, Table 1	The species selected in Table 1 appear to be somewhat random – are they the most common? They are not the most economically important species. Perhaps a more comprehensive list, ordered by abundance, commercial importance, or another metric, would be more useful than this subset.
5.	15, line 15	Whether or not EFH is designated for "every life stage" is probably not all that critical to know, and the comment may serve to introduce confusion. Councils designate at the life stage level when possible given the data we have available to us, so a lack of designation for larvae or juveniles for example does not convey the lack of importance of these stages, and doesn't have any real meaning beyond data availability.
6.	16, Table 1	Longfin squid was recently renamed *Doryteuthis paeleii*
7.	18, Figure 1	We have developed similar EFH overlays to support our plan amendments, but it important to know what such overlays are showing. EFH designations tend to be very general, and this probably explains why most of the TMS in the OSA are in one of two categories 11-15 or 16-20 designations. Designations also reflect underlying data availability, which is different inshore vs. offshore vs. off the edge of the shelf in deep waters. In addition, EFH isn't just the maps; it's the maps and

		correspondence with the text descriptions that accompany the maps that makes a particular area EFH. Overall, these sorts of overlays are probably useful, but shouldn't be taken too far as a decision metric. We also note that NEFMC is updating our EFH designations as part of an ongoing plan amendment. These are similar to our existing designations in many ways, but are generally more spatially refined, and incorporate additional years of data.
8.	19, line 5	Present is a very general term – maybe more appropriate to say abundant? Would be worth looking at observer or other fishery dependent data to assess occurrence of a specific fish.
9.	19, lines 10-11	NOAA has specific responsibility for management of certain ESA-listed species, so this language could be more precise.
10.	20, line 5, lines 15-16	Atlantic sturgeon critical habitat was just designated this month. Should confirm that they are unlikely in the OSA; the area does include sandy substrates shallower than 50 meters.
11.	22, Table 4	Tautog, blackfish? Tautog may be more common for some readers.
12.	23, lines 13-21	We agree that wolffish are not likely to be found in the OSA
13.	24, line 11	Oldest – maybe go with oldest considered in this study?
14.	24, line 23	For the following species commonly occurring in the OSA? In general, these data have been used in many more assessments than those listed here.
15.	25, lines 18-25	The clam survey is much older than 2012, but it was moved to a different vessel at that time. They use the whole time series (1982+) in assessments. During year 3 they also complete any missing stations, as needed, I believe. There was an assessment this year and the documents should have information about the survey, or check with Dan Hennen at NEFSC.
16.	30, line 14	Multispecies is large mesh groundfish; these maps will not cover small mesh fishing for whiting because these vessels are not fishing under a multispecies declaration code. The NROC maps are all by declaration code.
17.	31, line 31	Chart area = statistical area; this is how fisheries users typically refer to these areas
18.	34, line 11	Section 2.2.2.4? Not sure what this reference refers to.

19.	35, lines 6-19	Permit discussion is not all that helpful – maybe these data need to be framed differently, as a potential upper bound of fishing vessels that might be active in the area?
20.	38, 39, VMS maps	Should be careful when interpreting the single year maps, e.g. for squid. These species move around following the correct oceanographic conditions, and the fishery shifts spatially over time.
21.	40, lines 1-18	Observer data are a biased subsample of fishing activity, because coverage rates are designed to estimate discard rates for specific stocks. It isn't clear on the maps (e.g. page 41) what the units are – number of tows? Trips?
22.	40, lines 21-32	These drawings are really helpful.
23.	45, lines 7-8	Would be helpful to have actions like HDD, jet plowing, cable dredging explained in a table in appendix for readers not familiar with these activities
24.	45, line 11	It seems like the chance of increased vessel spills with increased traffic, while possible, is relatively remote.
25.	49, line 49	Reference to cod and sole – would be helpful to indicate here and throughout the report when studies from other regions looked at the same species we have here, vs. related species. Common names are not all that helpful as cod and sole refer to a variety of species.
26.	49, lines 19-20	Again, define noise impact minimization measures (pile driving soft starts, etc.) somewhere in the document or in an appendix.
27.	53, line 1	In terms of fish eggs, one species of particular concern is winter flounder, which has demersal, adhesive eggs and is present in the region. This species should be called out individually here.
28.	53, line 15	Do you mean to say that <u>incremental or additional</u> vessel traffic impacts would be negligible?
29.	55, line 16	Goldfish – is this a typo?
30.	55, lines 26-28	Delete 'in result' – redundant. More importantly, is it possible that there is insufficient information to conclude that turbine noise does not have adverse effects?
31.	57, lines 12-15	Throughout, I am struggling with the comments about potential mitigation measures and whether they would actually be required. For example, in this paragraph, "it can be expected that cables would be buried deep enough". On what does the

		author base this expectation? It might be clearer to say something like, burial depths would need to be agreed to in the construction and operations plan, which is written by the developer and approved by BOEM. If cables are buried to depths of x, this would reduce the chance of negative impacts.
32.	57-58	What is the relationship between µT and µV/m? Can these units of measure be explained at the beginning of the section? Without some context, these numbers (both magnitudes and units) aren't all that meaningful to readers not familiar with the science of electromagnetic fields.
33.	58, lines 12-25	Are studies being done on elasmobranchs in the Atlantic, since they appear to be more sensitive? We have fisheries for both skates, spiny dogfish, and larger coastal sharks.
34.	59, lines 5-7	Language is unclear here. Is depth/substrate more influential than EMF? Or, did EMF had no discernable effect?
35.	59, line 9	What are millitesla?
36.	59, lines 18-20	While there are already lots of cables in the area offshore NY and NJ, are cumulative effects of more new cables an issue?
37.	62, lines 3-5	Are recommendations like this one on invasive species all part of the best practices? If not, are they all collected in a list somewhere?
38.	62, lines 27-28	Possible to do post-construction hydrographic studies in the Atlantic? Why aren't these studies being done?
39.	63, lines 3-4	100 turbines reference – isn't this comparable to what could go into these areas off NY, especially given renewable energy goals?
40.	64, first paragraph	Is there any evidence that bottom trawls have hung up on the concrete mats used at the BIWF?
41.	64, line 10	Agree scallop and clam vessels may avoid areas with WTGs, but the phrasing of this line is awkward. Bear in mind that different types of ground gear will influence the extent to which a particular fishing vessel avoids hangs and other rough bottom.
42.	64, lines 17-18	Is the implication here that corridors with cables are not fishable?

43.	64, lines 22-25	Should cross reference if these issues of compensation are discussed elsewhere in report, e.g. in BMP section.
44.	65, lines 10-14	Is the BIWF exclusion of 300 ft likely to become a standard? Not sure that Cape Wind is a good example since it appears unlikely to ever be built.
45.	71, line 6	What factors would be used to justify exclusion zones during wind farm operations?
46.	71, line 23	Capitalize *Homarus*
47.	71, lines 25-31, continued onto next page	This whole section sounds a bit political. Does foreign oil have worse environmental impacts that domestic oil? Or is the issue more one of energy independence? The reference to the Obama administration should be reframed to be past-tense. It would be helpful to know if there is a similar policy under the current administration to support wind energy.

Additional comments:

Reduce use of acronyms wherever possible.

Atlantic surfclam is one word, not two (surf clam)

Wolffish has two Fs, not wolfish

EFH CONSULTATIONS

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

JUN 16 2017

Ms. Jennifer McCarthy
Chief, Regulatory Division
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Re: NAE-2015-01414, Town of Wellfleet, Dredge Project, Wellfleet, MA

Dear Ms. McCarthy:

We have reviewed the Public Notice and provided essential fish habitat (EFH) assessment dated July 2016 for the proposed dredging project located within Wellfleet Harbor, Wellfleet, Massachusetts. The proposed dredging includes dredging of two areas to 6 feet below mean low water (MLW) with a one foot overdepth allowance. Area 1 was last dredged in 2001 and includes the removal of 118,300 cubic yards (cy) of material over 14.6 acres, of which 2.4 acres are intertidal flats relative to MLW. Area 2 was last dredged in 1957 and includes the removal of 248,000 cy of material over 23.8 acres, of which 13.9 acres are intertidal flats relative to MLW. The Public Notice describes both areas within the proposed dredge footprints to be composed of sandy subtidal habitats and intertidal mudflats. No mitigation for resource impacts is currently proposed.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require federal agencies to consult with one another on projects such as this. Insofar as a project involves EFH, as this project does, this process is guided by the requirements of our EFH regulation at 50 CFR 600.920, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the relevant consultation procedure.

The Public Notice indicates you have made a preliminary determination that site-specific impacts may be substantial for the impacts associated with the proposed dredging of Area 2. We agree with this determination. Specifically, our preliminary determination is that this project would result in substantial adverse impacts to EFH. Further, because the project involves mudflats, which the Environmental Protection Agency has designated as "special aquatic sites," we also find that this project may result in substantial and unacceptable adverse effects to Aquatic Resources of National Importance as outlined in Part IV(3a) of our 1992 Memorandum of Agreement (MOA) between the Department of Commerce and the Department of the Army concerning Section 404(q) of the Clean Water Act. As a result, this project is poorly suited for our abbreviated consultation procedure and should be conducted pursuant to our Expanded Consultation Procedure outlined in our regulations at 50 CFR 600.920(i).

mb 6/23/17

Unfortunately, our ability to consult and ultimately assess potential impacts to EFH and associated marine resources is being complicated by deficiencies in the EFH assessment. In short, the EFH assessment is incomplete because it does not fully characterize the benthic resources within the mudflat habitats or include an alternatives analysis. A completed EFH assessment is a prerequisite to begin the EFH consultation process as specified in 50 CFR 600.920(i)(2). We request that you provide us with this information pursuant to 50 CFR 600.920 (h)(3) and (i)(2).

We also note your permitting obligations at 33 CFR Parts 320 through 330, and particularly at 40 CFR Part 230, as well as the process mutually agreed upon in our MOA. To ensure we provide the most appropriate EFH conservation recommendations for this project, we request the information detailed below be provided pursuant to the above referenced regulatory construct and to reserve our right to invoke the elevation process outlined in Part IV of our interagency MOA. Pursuant to 50 CFR 600.920(i)(5), if you do not provide the requested additional information, we will provide our EFH conservation recommendations based on the information we have been provided. Please note that any inconsistencies between our EFH conservation recommendations and your final decision are subject to elevation procedures as outlined in Part IV of our interagency MOA and 50 CFR 600.920(k)(2).

General Comments

Marine resources and impacts

The project is located in an important area for a number of marine and estuarine finfish and shellfish species, and are likely to result in direct and indirect adverse impacts to managed fish species and EFH. The area has been identified as EFH for 31 federally-managed species including, but not limited to, winter flounder, summer flounder, Atlantic cod, pollock, ocean pout, silver hake, red hake, white hake, windowpane flounder, little skate, winter skate, thorny skate, and surf clam.

Shellfish beds, including soft-shell clams, quahogs, and oysters are located within the proposed project footprints. The MA Division of Marine Fisheries has delineated the intertidal and subtidal areas of the proposed project footprints as areas for soft-shell clam and quahog spawning and settlement. A portion of the proposed dredge footprint has also been mapped for oyster spawning and settlement. These resources provide important ecological roles and habitat attributes for a number of managed species (Coen and Grizzle 2007, Nakamura and Kerciku 2000; McDermott et al. 2008, Dames and Libes 1993; and Forster and Zettler 2004). The direct removal of these species through dredging activities and turbidity impacts may significantly impact these resources in the vicinity of the project. Sessile benthic species, including oysters, in the project vicinity are highly vulnerable to sedimentation and turbidity impacts as well as direct removal by dredging activities.

Mud and sand habitats support distinct benthic communities that serve as EFH for managed fish species by directly providing prey and foraging habitat, or through emergent fauna providing increased structural complexity and shelter from predation. Intertidal mud and sand substrates

serve as EFH for multiple managed fish species during spawning, juvenile and/or adult life history stages, including, juvenile pollock, juvenile little skate, juvenile hake species, juvenile and adult windowpane flounder, and juvenile and adult life stages of winter flounder (Cargnelli et al. 1999; Chang et al. 1999; Pereira et al. 1999). Habitat attributes within fine grained substrates also provide important functions for managed fish species including shelter, foraging, and prey. For example, biogenic depressions, shells, moonsnail egg cases, anemone, and polychaete tubes within mud and sand habitats serve as shelter for red hake (Able and Fahay 1998, Wicklund 1966; Ogren et al. 1968; Stanley 1971; Shepard et al. 1986). Additionally, recent literature regarding the importance of shallow water habitats for managed fish species was reviewed and discussed in "Shallow Water Benthic Habitats in the Gulf of Maine: A Summary of Habitat Use by Common Fish and Shellfish Species in the Gulf of Maine" (Stevenson et al. 2014).

The U.S. Environmental Protection Agency has designated mudflats as "special aquatic sites" under the Section 404(b)(1) of the federal Clean Water Act, due to their important role in the marine ecosystem for spawning, nursery cover and forage areas for fish and wildlife. Juvenile fish and invertebrates seek shelter by burrowing into the soft sediments. Juvenile and adult fish utilize mudflats for foraging, and provide important post-spawn feeding areas for winter flounder. Mudflats are particularly susceptible to anthropogenic disturbances as they are found in sheltered, low-energy environments subject to a minimal natural disturbance regime. Mitigation for impacts to intertidal mudflat habitat can be difficult, making this habitat especially vulnerable to permanent loss.

EFH assessment deficiencies

The EFH assessment indicates that the project will remain shallow water habitat within the project footprints, but no evaluation or impact analysis on the loss and conversion of mudflat habitat to subtidal shallow water habitat was included. While the Public Notice indicates the impacts to intertidal mudflats will be 2.4 acres and 13.9 acres in Area 1 and Area 2, respectively, the calculations appear to be based on the location of MLW and not representative of the full extent of mudflat habitat within the proposed project footprints. For example, the Area 2 dredge footprint appears to be entirely above the -2' MLW line elevation, with all but one corner of the footprint above -1' MLW. The EPA designation of mudflats does not refer to a particular elevation and defines mudflats as "exposed at extremely low tides." Utilizing the MLW line to calculate the area of mudflat impact is likely greatly underestimating the aerial extent of mudflat impacts within the dredge footprints. To evaluate the full extent of impacts to mudflats, the mudflat impact area should be provided by calculating the area to be dredged: 1) above the lowest predicted tide, and 2) above mean lower low water. It is also not clear if the impact area calculations include side slope impacts or not. The calculations should be revised, or specified, to include side slope impacts.

To adequately evaluate and assess the extent of impacts, and potential measures that can be implemented to minimize such impacts, full characterization of the benthic resources within the mudflat habitats should be completed. The EFH assessment indicates that the area is not considered productive shellfish areas per the Shellfish Warden, but does not provide any information on shellfish or benthic resource surveys within the proposed dredge footprints. If

any surveys have been completed, but not provided, the survey results should be provided for our review and comment. We recommend coordination with us prior to the undertaking of any new site surveys for benthic characterization to ensure such surveys will provide the necessary level of benthic characterization for us to complete our consultation.

The Public Notice indicates that Area 2 has not been dredged since 1957. No information regarding the need for dredging Area 2 was provided in the Public Notice. The EFH assessment references the need to remove shoal areas to maintain use of the harbor, but does not specifically address the anchorage area. The extensive shoaling within Area 2 to re-establish the extensive, existing mudflat habitat over the last sixty years suggests infrequent vessel usage and/or a lack of need. Given the substantial adverse impact that would occur to mudflat habitat in Area 2, the need to re-create an anchorage in this area should be fully evaluated and alternatives to the proposed footprint that minimize mudflat impacts should be fully evaluated. Included in the analysis should be an evaluation of the number of vessels currently using the area as an anchorage, how many new vessels would be supported by the project as proposed (if applicable), the total number of vessels that the project would provide anchorage for (if applicable), and information on what alternatives are currently being utilized be vessels in the area.

Conclusion

In summary, this project involves potentially substantial unacceptable adverse impacts to Aquatic Resources of National Importance. For this reason, the EFH consultation should proceed pursuant to the Expanded Consultation Procedure outlined in our regulations at 50 CFR 600.920(i). In addition, the EFH assessment is incomplete. An evaluation of the full extent of impacts to mudflat habitat, characterization of benthic resources within the mudflat habitat, and an alternatives analysis are needed to complete the EFH assessment. This information is necessary for us to provide appropriate EFH conservation recommendations and complete our consultation with you for this project. Accordingly, we seek to extend both the comment period pursuant to Part II(4) of our MOA, as well as the consultation process pursuant to 50 CFR 600.920(i)(5) so that you may provide us with better information for our evaluation of impacts and the development of EFH conservation recommendations. Upon receipt of a complete EFH assessment, we will require up to 60 days to review the assessment and develop EFH consultation recommendations. If you have any questions regarding the EFH consultation process, please contact Alison Verkade at 978-281-9266 or alison.verkade@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: Phillip Nimeskern, USACE
Barbara newman, USACE
Max Tritt, PRD
Ed Reiner, EPA
John Logan, DMF
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC

References

Able, K. W. and Fahay, M. P. 1998. First year in the life of estuarine fishes in the middle Atlantic Bight; 342 p.

Cargnelli LM, Griesbach SJ, Packer DB, Berrien PL, Johnson DL and Morse WW. 1999. *Essential Fish Habitat Source Document:* Pollock, *Pollachius virens,* Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-131.

Chang S, Berrien PL, Johnson DL and Morse WW. 1999. Essential Fish Habitat Source Document: Windowpane, *Scophthalmus aquosus,* Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-137.

Coen LD and Grizzle RE. 2007. The importance of habitat created by molluscan shellfish to managed species along the Atlantic coast of the United States. Atlantic States Marine Fisheries Commission. Habitat Management Series #8.

Dame R and Libes S. 1993. Oyster reefs and nutrient retention in tidal creeks. Journal of Experimental Marine Biology and Ecology 171: 251-258.Dewey WF. 2000. The various relationships between shellfish and water quality. Journal of Shellfish Research 19: 656.

Forster S and Zettler ML. 2004. The capacity of the filter-feeding bivalve *Mya arenaria* L. to effect water transport in sandy beds. Marine Biology 144: 1183-1189.

McDermott S, Burdick 0, Grizzle R and Greene J. 2008. Restoring Ecological Functions and Increasing Community Awareness of an Urban Tidal Pond Using Blue Mussels. Ecological Restoration 26(3): 254-262.

Nakamura Y and Kerciku F. 2000. Effects of filter-feeding bivalves on the distribution of water quality and nutrient cycling in a eutrophic coastal lagoon. Journal of Marine Systems 26(2): 209-221.

Ogren L, Chess, J, Lindenberg, J. 1968. More notes on the behavior of young squirrel hake, Urophycis chuss. Underwater Naturalist 5(3):38-39.

Pereira JJ, Goldberg R, Ziskowski JJ, Benien PL, Morse WW, Johnson DL. 1999, Essential Fish habitat source document: winter flounder, *Pseudopleuronectes americanus*, life history and characteristics. NOAA Technical Memorandum NMFS-NE-I38. Northeast Fisheries Science Center, Woods Hole, MA.

Shepard AN, Theroux RB, Cooper RA, Uzmann JR. 1986. Ecology of Ceriantharia (Coelenterata, Anthozoa) of the northwest Atlantic from Cape Hatteras to Nova Scotia. Fishery Bulletin 84:625-646.

Stanley, DJ. 1971. Fish-produced markings on the outer continental margin east of the Middle Atlantic states. Journal of Sedimentary Petrology 41:159-170

Stevenson, DK, S Tuxbury, MR Johnson, C Boelke. 2014. Shallow Water Benthic Habitats in the Gulf of Maine: A Summary of Habitat Use by Common Fish and Shellfish Species in the Gulf of Maine. Greater Atlantic Region Policy Series 14-01. NOAA Fisheries Greater Atlantic Regional Fisheries Office. 77pp.

Wicklund R. 1966. Observations on the nursery grounds of young squirrel hake, Urophycis chuss. Underwater Naturalist 4(1):33-34.

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

Randall G. Hintz
Chief, Operations Support Branch
U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, NY 10278

Dear Mr. Hintz:

We have reviewed the updated essential fish habitat (EFH) assessment for the maintenance dredging of the Sandy Hook Federal Navigation Channel and the placement of the dredged material within the U.S. Army Corps of Engineers' (ACOE) Sea Bright Offshore Borrow Area (SBOBA) located in the Atlantic Ocean offshore of Monmouth County, NJ. During the late fall or early winter of 2017, approximately 350,000 cubic yards of sand will be removed from a 2.6 acre shoal within the Sandy Hook Channel using a clamshell dredge and placed in the SBOBA. This material will be removed from the SBOBA in late 2018 as a source of sand for the ACOE's beach nourishment project at Union Beach.

In our letter dated April 25, 2017, we requested additional information including a revised EFH assessment, the location within the larger SBOBA where the material would be placed and the location and dates of previous activities in the SBOBA, so that the potential effects of the project on EFH could be evaluated fully. We also recommended that the ACOE consider direct placement of the dredged sand on beaches in need of nourishment and that the ACOE coordinate with the National Park Service (NPS) to evaluate options for placement of the sand in critical erosion areas of the Sandy Hook Unit of the Gateway National Recreation Area. According to your letter, you have evaluated direct placement of the sand on beaches that are part of the ACOE's federal beach nourishment program and you determined that it was not feasible at this time due to the increased costs and logistics, but you will continue to consider this option for the future. You are also coordinating with the NPS to determine if material can be used at Sandy Hook in the future. We appreciate these efforts.

We have reviewed the EFH worksheets provided for the dredging and the dredged material placement, as well as the information on past borrow site use. The questions raised in our previous letter have been addressed. As currently proposed, the dredging of the shoal at the Sandy Hook Channel and the placement of the material at the SBOBA will adversely affect 132.6 acres of EFH, including 2.6 acres from the dredging and 130 acres for the placement of the dredged material. These adverse effects are the result of the disturbance of the sediments and removal of benthic organisms that serve as prey species during the dredging, the smothering of benthic organisms at the placement site, and increases in turbidity during both the dredging and placement activities. Water quality impacts are expected to be temporary and minor. The effects on the benthic community will also be temporary, but the recovery may not occur fully while the

mb 6/23/17

channel is activity maintained or while the borrow area remains in use.

Although adverse effects to EFH will result from this project, the ACOE has avoided and minimized them to the maximum extent practicable through the use of best management practices during dredging and sand placement and through the management of the sand resources at the SBOBA. As a result, additional EFH conservation recommendations are not needed for this project.

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 determination. If you have any questions, please contact me at (732) 872-3023 or karen.greene@noaa.gov.

Sincerely,

Karen M. Greene
Mid-Atlantic Field Office Supervisor

cc: D. Marrone – GARFO PRD
M. Davis - NJDEP Office of Dredging
C. Moore – MAFMC
T. Nies – NEFMC
L. Havel – ASFMC
J. Gallo, G. Perlas, E. Wrocenski - ACOE

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

JUN 28 2017

Jennifer McCarthy
Chief, Regulatory Division
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

RE: Essential Fish Habitat Consultations on the Connecticut River in Vermont and New Hampshire

Dear Ms. McCarthy: :

We are writing in regards to the Essential Fish Habitat (EFH) Consultation process in the States of Vermont and New Hampshire within the Connecticut River. As you know, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require Federal agencies to consult with one another on activities that may have an adverse effect to EFH. 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 agencies obligations in this consultation procedure.

In 1998, the New England Fishery Management Council designated EFH for Atlantic Salmon (*salmo salar*) throughout its historic range in New England, including the Connecticut River Watershed in the States of Vermont and New Hampshire. At this time, anadromous Atlantic Salmon are no longer present in the Connecticut River or its tributaries within Vermont and New Hampshire. Therefore, we are not requiring EFH consultations for activities in the Connecticut River and its tributaries within Vermont and New Hampshire. However, we maintain that permanent impacts to diadromous fish habitat be avoided and minimized to ensure viable habitat should the status of the species change. Should this occur, we will notify your office to reassess the EFH consultation process in the Connecticut River in Vermont and New Hampshire.

Should you wish to discuss this matter further, please contact Christopher Boelke at 978-281-9131 or Christopher.boelke@noaa.gov

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
For Habitat Conservation

cc: Tom Nies, NEFMC

mb 6/30/17

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

Lt. Colonel Kristen N. Dahle
District Engineer
Department of the Army
Philadelphia District, Corps of Engineers
Wanamaker Building, 100 Penn Square East
Philadelphia, Pennsylvania 19107-3391

JUL 25 2017

RE: CENAP-OP-R-2017-00089-87, Township of Little Egg Harbor/Ray Gormly, Mayor
Little Egg Harbor/Tuckerton Borough Dredging and Beneficial Reuse

Dear Lt. Colonel Dahle:

We have reviewed the essential fish habitat (EFH) assessment received on June 29, 2017, and the above referenced Public Notice dated May 26, 2017, which describes an application by the Township of Little Egg Harbor to dredge material from eight waterways in the Great Bay-Little Egg Harbor (GB-LEH) estuary in Little Egg Harbor and Tuckerton, Ocean County, New Jersey and to place the dredged material on nearby marshes. The applicant also proposes to create a living shoreline along Iowa Court in Little Egg Harbor using the dredged material. The applicant has received funds from the U.S. Department of Interior though the National Fish and Wildlife Foundation for the proposed project.

For the dredging/restoration component of the project, the applicant proposes to hydraulically dredge 151, 350 cubic yards (cy) of accumulated sediment from eight waterways in the GB-LEH estuary, including Thompson's Creek, sections of manmade lagoons adjacent to Tuckerton Beach, Tuckerton Creek, Rose Creek, Mystic Island Northwest Channel, Mystic Island Southwest Channel, manmade lagoons adjacent to the previous four waterways, and man-made lagoons adjacent to Osborn Island, Ocean Boulevard Channel, and Ocean Boulevard Access Channel. The proposed dredging is intended to restore these channels to authorized project dimensions for navigational use.

The applicant proposes to place the dredged material on 50.5 acres of existing low marsh habitat, including tidal ponds, along Great Bay Boulevard in Little Egg Harbor. The stated purpose for the sediment placement is to restore marsh habitat the applicant described as degraded and to help slow marsh loss. Five work areas (cells) are proposed within the marsh for placement of the dredged material. The material would be transferred from the dredge sites to the cells through a dredge pipeline, and discharged into the low-lying areas of the marsh, including tidal ponds, to a depth of up to two feet. The sediment deposition areas would be planted with native vegetation once the sediment has stabilized.

The applicant also proposes to create a living shoreline that would fill 0.495 acres of shallow water habitat adjacent to Iowa Court. The living shoreline would include construction of a 385 linear foot (lf) stone breakwater, construction of four 30 lf wooden breakwaters, placement of

mb 7/27/17

1,350 cy of clean sand, and planting of native species.

The information provided to us in the public notice, the EFH assessment and other supplemental materials do not provide sufficient justification for placement of fill in existing aquatic habitat. The applicant has not demonstrated that the existing project site is degraded, or that the habitat functions of the site are diminished and in need of restoration. In addition, the EFH assessment provided does not evaluate fully all of the adverse effects of the proposed project and cannot be considered complete. In order to comply with the consultation requirements of the Magnuson Stevens Fishery Conservation and Management Act (MSA), a full and complete EFH assessment that includes an evaluation of the effects of the conversion of shallow water habitat and low marsh to high marsh should be provided.

Based upon the information that has been provided, we must conclude that the project as currently proposed will have substantial and unacceptable impacts to aquatic resources of national importance including EFH for summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudopleuronectes americanus*) and bluefish (*Pomatomus saltatrix*), as well as a number of other commercially and recreationally important species. As a result, we recommend that you hold issuance of a permit for this project in abeyance in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies until the required EFH consultation is complete and the applicant provides additional information to demonstrate the wetlands of the project area are degraded and in need of restoration, that the proposed restoration methods will address any habitat degradation that may exist at the project site, and a detailed post construction monitoring plan is provided. This plan should include clearly defined success criteria and performance measures, and should describe the actions that will be taken should those measures not be met.

Magnuson Stevens Fisheries Management and Conservation Act (MSA)

The project area has been designated as EFH for a variety of life stages of federally managed species including Atlantic butterfish (*Peprilus triacanthus*), Atlantic cod (*Gadus morhua*), bluefish, clearnose skate (*Raja eglanteria*), cobia (*Rachycentron canadum*), king mackerel (*Scomberomorus cavalla*), little skate (*Leucoraja erinacea*), monkfish (*Lophius americanus*), red hake (*Urophycis chuss*), Spanish mackerel (*Scomberomorus maculates*), summer flounder, windowpane flounder (*Scophthalmus aquosus*), winter flounder, winter skate (*Leucoraja ocellata*), and others.

EFH for highly migratory species designated in the area includes: bluefin tuna (*Thunnus thynnus*), dusky shark (*Carcharhinus obscurus*), sandbar shark (*Carcharhinus plumbeus*), sand tiger shark (*Odontaspis taurus*), scalloped hammerhead shark (*Sphyrna lewini*), smooth dogfish (*Mustelus canis*), and tiger shark (*Galeocerdo cuvieri*). The mouth of the GB-LEH estuary has been designated as a Habitat Area of Particular Concern (HAPC) for sandbar shark. HAPCs are discrete subsets of EFH that provide important ecological functions and/or are especially vulnerable to degradation.

Dusky and sand tiger sharks have been listed as Species of Concern by NOAA. Species of Concern are those species about which we have concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the

Endangered Species Act (ESA). The goal is to promote proactive conservation efforts for these species in order to preclude the need to list them in the future.

The MSA requires federal agencies to consult with us on projects such as this that may affect EFH adversely. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments, lists the required contents of EFH assessments, and generally outlines each agency's obligations in this consultation procedure.

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" and further states that:

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

The EFH assessment provided for this project does not adequately evaluate all of the impacts of the proposed project on EFH or federally managed species. The information in the assessment does not demonstrate that the wetlands to be filled are degraded and in need of sediment. Based upon the information provided, it appears that the proposed project will result in the loss of EFH through the conversion of open water and low marsh to high marsh habitats. The assessment does not evaluate the effects that this loss of EFH will have on federally managed species and their prey. The loss of forage and refuge habitat is also not considered fully.

Aquatic Resources

Wetlands

Tidal wetlands are essential for healthy fisheries, coastlines, and communities, and are an integral part of our economy and culture. Estuarine wetlands and shallow water habitats within the project area provide nursery and forage habitat for a variety of species of concern to us including alewife, Atlantic croaker *(Micropogonias undulatus),* Atlantic menhaden *(Brevoortia tyrannus),* blueback herring, spot *(Leiostomus xanthurus),* and striped bass *(Morone saxatilis),* as well as federally managed bluefish, winter flounder and summer flounder. Important forage species such as mummichog *(Fundulus heteroclitus),* Atlantic silverside *(Menidia menidia),* inland silverside *(Menidia beryllina),* striped killifish *(Fundulus majalis)* and bay anchovy *(Anchoa mitchilli)* also use these areas. Mummichog, killifish, anchovies and other small fish and benthic organisms found in estuarine wetlands provide a valuable food source for many of the commercially and recreationally valuable species mentioned above including striped bass, summer flounder, weakfish, red hake, scup, and windowpane (Steimle et al. 2000).

Salt marshes provide habitat for fiddler crabs and other intertidal benthic species, and provide foraging grounds for wading birds, shorebirds, waterfowl, estuarine fishes, and blue crabs. Estuarine marsh grasses provide many ecological functions to the wetland and the adjacent waters, including as a source of organic nutrients, stabilization of sediments, and absorption of contaminants.

The primary production in wetlands forms the base of the food web that supports invertebrates and forage fish that are then prey species for larger fish such as bluefish. Surface water retention and detention and ground water recharge provides flood control services to the surrounding community. Wetlands may help to moderate global climate change through carbon storage in wetland plant communities and soil.

Shellfish

Shellfish such as hard clam (*Mercenaria mercenaria*), soft shell clam (*Mya arenaria*), oyster (*Crassostrea virginica*), ribbed mussel (*Geukensia demissa*), blue crab (*Callinectes sapidus*), and horseshoe crab (*Limulus polyphemus*) occur in the project area. In addition to their commercial value, shellfish have an important ecological role in the GB-LEH estuary. Coen and Grizzle (2007) discuss the ecological value of shellfish habitat to a variety of managed species (e.g. winter flounder) and have suggested its designation as EFH for federally managed species. Clams are a prey species for a number of federally managed fish including skates, bluefish, summer flounder, winter flounder, and windowpane (Steimle et al. 2000). Infaunal species such as clams filter significant volumes of water, effectively retaining organic nutrients from the water column (Nakamura and Kerciku 2000; Forster and Zettler 2004).

Mussels and oysters are found along shorelines attached to hard substrates, are an important food resource for fish and birds, and as filter feeders improve water quality (Bain et al. 2007). Reef forming species such as mussels and oysters support an increased diversity of finfish and invertebrates, cycle material between the water column and substrate and have the potential to enhance water quality (Dewey 2000; Nakamura and Kerciku 2000; Coen and Grizzle 2007; McDermott et. al. 2008). Further, mussels are an important prey item for many animals in the Mid-Atlantic region (Newell 1989). Steimle et al (2000) reported that mussel spat were components of the diets of winter flounder, scup, black sea bass and tautog. Although no known oyster reefs exist in the project area presently, scattered live oysters can be found in certain areas, indicating the presence of isolated populations.

Anadromous Fishes

Anadromous species such as alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) use Tuckerton Creek as spawning, nursery and forage habitat. These fish are a food source for several federally managed species. Buckel and Conover (1997) in Fahey et al. (1999) reports that diet items of juvenile bluefish include *Alosa* species such as these. Juvenile *Alosa* species have been identified as prey species for windowpane flounder *(Scophthalmus aquosus)* and summer flounder *(Paralichthys dentatus)* in Steimle et al. (2000).

Alewife and blueback herring, collectively known as river herring, spend most of their adult life at sea, but return to freshwater areas to spawn in the spring. Both species are believed to be repeat spawners, generally returning to their natal rivers (Collette and Klein-MacPhee 2002). In the Mid-Atlantic, landings have declined dramatically since the mid-1960s and have remained very low in recent years (ASMFC 2007). Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in alewife and blueback herring populations throughout much of their range since the mid-1960s, river herring have been designated as a Species of Concern by NOAA.

Potential Project Impacts

Dredging

Impacts on Fishes and EFH

Winter flounder migrate into shallow water or estuaries and coastal ponds to spawn, and tagging studies show that most return repeatedly to the same spawning grounds (Lobell 1939, Saila 1961, Grove 1982 in Collette and Klein-MacPhee 2002). They typically spawn in the winter and early spring although the exact timing is temperature dependent and thus varies with latitude (Able and Fahay 1998). Winter flounder have demersal eggs that sink and remain on the bottom until they hatch. After hatching, the larvae are initially planktonic, but following metamorphosis they assume an epibenthic existence. Winter flounder larvae are negatively buoyant (Pereira et al. 1999), and are typically more abundant near the bottom (Able and Fahay 1998). These life stages are less mobile and thus more likely to be affected adversely by bridge construction and demolition. To minimize impacts to winter flounder early life stages and their EFH, we recommend that activities be avoided from January 1 to May 31 of each year in areas that have been designated as EFH for winter flounder early life stages.

Increases in turbidity due to the resuspension of sediments into the water column during dredging can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine-grained estuarine/marine sediments. Suspended sediment can also mask pheromones used by migratory fishes to reach their spawning grounds, 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).

Noise from the construction activities may also result in adverse effects. Our concerns about noise effects comes from an increased awareness that high-intensity sounds have the potential to harm both terrestrial and aquatic vertebrates (Fletcher and Busnel 1978; Kryter 1984; Richardson et al. 1995; Popper 2003; Popper et al. 2004). Effects may include (a) non-life threatening damage to body tissues, (b) physiological effects including changes in stress hormones or hearing capabilities, or (c) changes in behavior (Popper et al. 2004). In order to minimize the adverse effects of suspended sediment and noise on migrating anadromous fish, we recommend in-water work be avoided from March 1 to June 30 during the upstream migration to their spawning grounds.

The EFH final rule states that the loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat; the definition of EFH includes waters and substrate necessary to fish for feeding. Therefore, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH. As a result, activities that adversely affect the spawning success and the quality for the nursery habitat of these anadromous fish can adversely affect the EFH for juvenile bluefish, windowpane and summer flounder by reducing the availability of prey items.

Shellfish
Dredging in the project area can also affect EFH adversely through impacts to prey species such as bivalves. Steimle et al. (2000) reported that winter flounder diets include the siphons of hard clams and soft shell clams. The project area is mapped on 1963 DOI shellfish maps as moderate and high value commercial hard clam habitat. Proposed dredge sites, including Tuckerton Creek, are near shellfish harvest areas that are conditionally approved (November 1 to April 30) or restricted. Dredging and sediment placement should be avoided in and adjacent to areas that are conditionally approved during the months when harvesting is allowed. In addition, aquaculture lease sites also exist in the project area. Coordination with the leaseholders should be undertaken to ensure any activities that may be authorized in the future do not affect the aquaculture activities adversely.

Sediment Placement on Wetlands
As currently proposed, the sediment placement component of the project will result in the loss of open water habitats within the marsh, and the degradation of the existing low marsh habitat through the placement of up to two feet of fill material on the sites. As discussed above, wetlands and the associated open water areas within the marshes provide important habitat for a number of federally managed species.

The information provided to us does not demonstrate that the wetland areas proposed for dredged material placement are degraded and in need of restoration, or that the appropriate means of restoration is to place sediments on them. As a result, we remain concerned that the proposed project will result in the loss and degradation of existing, functional fisheries habitat. To demonstrate that this project is a habitat restoration or enhancement project, in addition to the sea level rise projections already provided, the applicant should provide a detailed characterization of the existing conditions of the wetlands to be modified including historical aerial photos or surveys showing the changes in the marsh over time, as well as the topographic survey and rapid marsh assessment referenced in the public notice. The applicant should also document the functional deficiencies of the site and provide an explanation of how placing dredged material on the existing marsh will improve those functional deficiencies.

The applicant should also provide information on the sediment quality and contaminant levels on the marsh surface and the material to be placed upon the marsh and in the tidal ponds to ensure that contaminant levels in the project area are not increased and do not pose an increased risk to fish and wildlife. The dredged material should also be evaluated to ensure that the composition matches the existing conditions of the placement sites, and that any acid-producing sediments are not placed on the marsh.

Previous sediment placement projects have resulted in detrimental effects to the marsh from certain types of equipment. As a result, more detailed construction plans should be provided to ensure that the equipment and construction methods used do not result in additional harm to the existing wetlands.

According to the public notice, the proposed height of the sediment deposition layer will be targeted for the optimal elevation for high marsh growth. We recognize that high marsh habitat performs many important ecological functions, and in the landscape context it can increase the

diversity of habitats within the ecosystem and support many avian species. However, when compared to open water and low marsh, the value as habitat for fish is lower and less direct. Less frequent tidal inundation of the high marsh limits fish access, so the conversion from open water and low marsh to high marsh will result in the loss of habitat for fish. In order to ensure that the ecological tradeoff that will result from the placement of dredged material on the marsh does not result in a disproportionate loss of fish habitat and EFH, the target elevations should include low marsh.

Restoration projects in other regions of the mid-Atlantic have used a ratio of 80% low marsh to 20% high marsh. Our mandates under the MSA require us to protect, conserve and enhance EFH. Habitat conversions must therefore also benefit aquatic resources, and not result in the loss or degradation of EFH. As a result, if it is determined that the deposition areas are degraded and in need of sediment, the cells should be designed to create a mix of high and low marsh.

Living Shoreline

We understand that populations of oyster and ribbed mussel were found at the Iowa Court living shoreline project area in the spring of 2017. The shoreline also supports a marsh mat with native vegetation. As currently proposed, the living shoreline project will fill these areas and result in the loss of ecologically important oysters and mussels, as well as the loss of existing low marsh. To minimize the adverse effects to important ecological resources, we recommend that the design of the living shoreline incorporate these existing components. The shellfish populations should be relocated to an adjacent area or added to the design of the breakwater, and the material used in the breakwater should be favorable to oyster spat colonization.

Monitoring

We are concerned about negative effects of the placement of dredged material on marshes and the risk of failure these projects present. So far, we have not seen evidence that thin layer placement of dredged material on the marshes of NJ has been successful in restoring marsh habitat. Post-construction monitoring is essential to determine if the project is successful in both the short and long term. The applicant should develop a post-construction monitoring and maintenance plan that includes monitoring of site elevations and compaction of the material placed on the marsh, the vegetative and benthic community recovery, and use of the site by aquatic and avian species. This plan should be provided to us for review and comment prior to any decision on permit issuance is made. Annual reporting of the monitoring results and any adaptive management actions taken should also be a component of the monitoring plan. This report should be provided to the Corps and to us, and site visits should be scheduled if requested.

Performance measures and success criteria should be established. Adaptive management triggers should be developed and potential corrective actions should be identified. Invasive species monitoring and control measures should also be included in the plan, as high marshes can be more susceptible to invasion by *Phragmites australis* and other undesirable species. Performance measures, success criteria, and post-construction monitoring should also be established for the living shoreline component of the project to ensure that the vegetation planted in the area is successful, erosion has been reduced and the shellfish populations that currently exist in the area are restored.

Monitoring of both the sediment placement sites and the living shoreline site should take place for a minimum of five years, longer if success is not achieved in that time or if the implementation of significant adaptive management actions is necessary.

Endangered Species Act
Federally listed species including the threatened loggerhead (*Caretta caretta*), and the endangered Kemp's ridley (*Lepidochelys kempi*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles and Atlantic sturgeon (*Acipenser oxyrhynchus*) may be present in the project area. The lead federal action agency should determine the nature and extent of effects and coordinate with NMFS' Protected Resources Division. Should you have any questions about the section 7 consultation process, please contact Peter Johnson at (978) 282-8416 or by e-mail (peter.b.johnsen@noaa.gov).

Conclusion
In summary, as proposed, we must conclude that 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 between our agencies. As discussed above, we are concerned about the potential adverse effects of the placement of dredged material on the tidal salt marshes and the adverse effects to EFH that will result from the activities proposed by the applicant. We recommend that a decision on permit issuance be withheld until the required EFH consultation is complete and additional information to demonstrate the wetlands of the project area are degraded and in need of restoration, that the proposed restoration methods will address any habitat degradation that may exist at the project site, and a detailed post construction monitoring plan is provided.

We look forward to continued coordination on this project so our concerns can be resolved at the staff level. We understand that an interagency meeting is being planned for some time in August. We hope that the applicant will provide the information requested above in advance of that meeting, so that the information can be discussed and a resolution to our concerns can be developed. If you have any questions or need additional information on this matter, please do not hesitate to contact Ursula Howson at ursula.howson@noaa.gov or (732) 872-3116.

Sincerely,

John Bullard
for Regional Administrator

cc: PRD – P. Johnsen
FWS – S. Mars
EPA – Region II, D. Montella
NJDEP – Office of Dredging – M. Davis
MAFMC – Chris Moore
NEFMC- Tom Nies
ASMFC- Lisa Havel

Literature Cited

Able, K.W. and M.P. Fahey. 1998. The First Year in the Life of Estuarine Fishes of the Middle Atlantic Bight. Rutgers University Press. New Brunswick, NJ

Atlantic States Marine Fisheries Commission. 2007. Species Profile: shad and river herring: Atlantic states seek to improve knowledge of stock status and protect populations coast wide. www.asmfc.org. Washington, DC.

Auld, A.H. and J.R. Schubel. 1978. Effects of suspended sediments on fish eggs and larvae: a laboratory assessment. Estuar. Coast. Mar. Sci. 6:153-164.

Bain, M., J. Lodge, D.J. Suszkowski, D. Botkin, A. Brash, C. Craft, R. Diaz, K. Farley, Y. Gelb, J.S. Levinton, W. Matuszeski, F.Steimle, and P. Wilber. 2007. Target ecosystem characteristics for the Hudson Raritan Estuary: technical guidance for developing a comprehensive ecosystem restoration plan. A report to the Port Authority of NY/NJ. Hudson River Foundation, New York, NY.

Breitburg, D.L. 1988. Effects of turbidity on prey consumption by striped bass larvae. Trans. Amer. Fish. Soc. 117: 72-77.

Buckel, J.A. and D.O. Conover. 1997. Movements, feeding periods, and daily ration of piscivorous young-of-the-year bluefish, *Pomatomus saltatrix*, in the Hudson River estuary. Fish. Bull. (U.S.) 95(4):665-679.

Burton, W.H. 1993. Effects of bucket dredging on water quality in the Delaware River and the potential for effects on fisheries resources. Prepared for: Delaware Basin Fish and Wildlife Management Cooperative, by Versar Inc, Columbia MD.

Coen, L.D. and R.E. Grizzle. 2007. The importance of habitat created by molluscan shellfish to managed species along the Atlantic coast of the United States. Atlantic States Marine Fisheries Commission. Habitat Management Series #8.

Collette, B.B. and G. Klein-MacPhee. eds. 2002. Bigelow and Schroeder's fishes of the Gulf of Maine. Smithsonian Institution. Washington, D.C.

Dewey, W.F. 2000. The various relationships between shellfish and water quality. Journal of Shellfish Research 19:656.

Fahey, M.P., P.L. Berrien, D.L. Johnson and W.W. Morse. 1999. Essential Fish Habitat Source Document: Bluefish, *Pomatomus saltatrix* life history and habitat characteristics. U.S. Dep. Commer., NOAA Technical Memorandum NMFS-NE-144.

Fletcher, J.L. and R.G. Busnel. 1978. Effects of Noise on Wildlife. Academic Press, New York.

Forster, S. and M.L. Zettler. 2004. The capacity of the filter-feeding bivalve *Mya arenaria* L. to affect water transport in sandy beds. Marine Biology 144:1183–1189.

Grove, C.A. 1982. Population biology of the winter flounder, *Pseudopleuronectes americanus*, in a New England estuary. M.S. thesis, University of Rhode Island, Kingston, 95 pp.

Kryter, K D. 1985. The Handbook of Hearing and the Effects of Noise (2nd ed.). Academic Press, Orlando, Florida.

Lobell, M.J. 1939. A biological survey of the salt waters of Long Island. Report on certain fishes: Winter flounder (*Pseudopleuronectes americanus*). New York Conserv. Dept. 28th Ann. Rept. Suppl., Part I pp 63-96.

McDermott, S., D. Burdick, R. Grizzle and J. Greene. 2008. Restoring ecological functions and increasing community awareness of an urban tidal pond using blue mussels. Ecological restoration 26(3):254-262.

Nakamura Y. and F. Kerciku. 2000. Effects of filter-feeding bivalves on the distribution of water quality and nutrient cycling in a eutrophic coastal lagoon. Journal of Marine Systems 26(2):209-221.

Nelson, D.A. and J.L. Wheeler. 1997. The influence of dredging-induced turbidity and associated contaminants upon hatching success and larval survival of winter flounder, *Pleuronectes americanus*, a laboratory study. Final report, Grant CWF #321-R, to Connecticut Department Environmental Protection, by National Marine Fisheries Service, Milford CT.

Newcombe, C.P. and D.D. MacDonald. 1991. Effects of suspended sediments on aquatic ecosystems. N. Amer. J. Fish. Manag. 11:72-82.

Newell, R.I.E. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North and Mid-Atlantic)--blue mussel. U.S. Fish. Wildl. Serv. Biol. Rep. 82(11. 102).

Pereira, J. J., R. Goldberg, J. J. Ziskowski, P.L. Berrien, W.W. Morse and D.L. Johnson. 1999. Essential Fish Habitat Source Document: Winter Flounder, *Pseudopleuronectes americanus,* life history and habitat characteristics. U.S. Dep. Commer., NOAA Technical Memorandum NMFS-NE-138.

Popper, A.N. 2003. Effects of anthropogenic sound on fishes. Fisheries 28:24-31.

Popper, A N., J. Fewtrell, M E. Smith, and R.D. McCauley. 2004. Anthropogenic sound: Effects on the behavior and physiology of fishes. MTS J. 37: 35-40.

Richardson, W.J., C R. Greene Jr., C.I. Malme and D H. Thomson. 1995. Marine Mammals and Noise. Academic Press, New York.

Saila, S.B. 1961. The contribution of estuaries to the offshore winter flounder fishery in Rhode Island. *Proc. Gulf. Carib. Fish. Inst.* 14:95-109.

Steimle, F.W., R.A. Pikanowski, D.G. McMillan, C.A. Zetlin, S.J. Wilk. 2000. Demersal fish and American lobster diets in the Lower Hudson-Raritan Estuary. NOAA Technical Memorandum NMFS-NE-161. Woods Hole, MA. 106 p.

Waldman, J. 2008. Research opportunities in the natural and social sciences at the Jamaica Bay Unit of Gateway National Recreation Area. National Park Service. 78 p.

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

AUG 10 2017

Ms. Barbara Newman
Chief, Regulatory Division
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

RE: NAE-2006-2309, Mashpee Neck Marina, Inc., Marina Maintenance, Reconfiguration, and Expansion Project, Mashpee, MA.

Dear Ms. Newman:

We have reviewed the Public Notice for the proposed marina project in Shoestring Bay, Mashpee, Massachusetts. The proposed project includes replacement of an existing bulkhead, relocation of an existing boat ramp, new and maintenance dredging, dock reconfiguration and expansion, installation of a new boat wash facility and pier reconfiguration and expansion, and the installation of a new fuel dock. Approximately 282 square feet (SF) of area below the high tide line (HTL) is proposed to be filled for the bulkhead replacement. The boat ramp relocation includes placement of fill over 1,584 SF, with 220 SF of fill placed below the HTL, and installation of a new 18' x 88' concrete ramp with 8' x 18' anti-scour pad. The proposed dredging includes 30,759 SF of maintenance dredging and 154,806 SF of new dredging to remove a total of 19,240 cubic yards of sediment. The proposed dock reconfiguration and expansion includes expanding the existing 6,433 SF of docks to 18,982 SF. The proposed new boat wash facility and pier reconfiguration and expansion includes work landward of the proposed new HTL and replacement of a 40' x 25' pier with a 26' x 112' pier. The proposed new fuel dock includes the installation of two ramps and floating docks, one with a 10' x 42' floating dock and 4'x 25' ramp, and the second with a 4' x 36' floating dock and a 3' x 35' ramp. Compensatory mitigation to offsest project impacts is not currently proposed.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require Federal agencies to consult with one another on projects like this project. Because the project involves essential fish habitat (EFH), the consultation process is guided by the EFH regulatory requirements under 50 CFR 600.920, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The proposed project may have substantial adverse effects to EFH, however, our ability to assess potential impacts to EFH and associated marine resources is being complicated by deficiencies in the EFH assessment included in the Public Notice. Specifically, you have not provided us with a complete EFH assessment as is required pursuant to 50 CFR 600.920. We offer the following comments to assist you in preparing a complete EFH assessment.

General Comments

Marine resources and impacts

A total of 20 managed fish species occur in the project vicinity and may be adversely impacted by the proposed marina development. Of particular concern are winter flounder, summer flounder, windowpane flounder, little skate, winter skate, scup, and black sea bass. These species have life stages that occur in shallow water habitats in the vicinity of the project and have specific habitat requirements at various life stages that may be adversely and permanently impacted by the proposed project (Stevenson et al. 2014). Multiple fish and shellfish species that serve as important prey for managed fish species are also found in mud and sand shallow water habitats in the project vicinity, including American eel, lobster, tautog, tomcod, sand lance, smooth flounder, soft-shelled clam, blue mussels, and razor clams (Stevenson et al. 2014).

Shallow water habitat within the proposed dredge footprints will be impacted through direct removal of resources and/or alteration of habitat attributes from the proposed dredging. Mud and sand habitats support distinct benthic communities that serve as EFH for managed fish species by directly providing prey and foraging habitat, or through emergent fauna providing increased structural complexity and shelter from predation. Mud and sand substrates serve as EFH for multiple managed fish species during spawning, juvenile and/or adult life history stages, including, juvenile little skate, juvenile and adult windowpane flounder, and all life stages of winter flounder (Cargnelli et al. 1999; Chang et al. 1999; Pereira et al. 1999, Stevenson et al. 2014). Habitat attributes within fine grained substrates also provide important functions for managed fish species including shelter, foraging, and prey. Recent literature regarding the importance of shallow water habitats for managed fish species was reviewed and discussed in "Shallow Water Benthic Habitats in the Gulf of Maine: A Summary of Habitat Use by Common Fish and Shellfish Species in the Gulf of Maine" (Stevenson et al. 2014).

Intertidal habitats support distinct marine communities and it has been well established that these habitats provide important foraging habitats and areas of refuge from predation for juvenile fish during periods of high tide (Helfman et al. 2009). Multiple managed fish species in the project vicinity have life history stages that are found in the intertidal zone including, winter flounder, little skate, and windowpane flounder. The proposed new dredging will result in a loss of lower intertidal habitat through conversion to subtidal habitat, a deepening of shallow-water habitat, and degredation of the newly dredged areas as a result of marina operations and expansion. These alterations will result in direct and indirect adverse impacts to managed fish species and EFH.

Shellfish beds, including soft-shell clams and quahogs, have been mapped by MA Division of Marine Fisheries along adjacent areas. These resources provide important ecological roles and habitat attributes for a number of managed species (Nakamura and Kerciku 2000; Forster and Zettler 2004; Coen and Grizzle 2007; McDermott et al. 2008,). The direct removal of these species through dredging activities and turbidity impacts may significantly impact these resources in the vicinity of the project. Sessile benthic species in the project vicinity are highly vulnerable to sedimentation and turbidity impacts as well as direct removal by dredging activities.

In addition, dredging results in suspended sediments in the water column and increased turbidity which has been documented to cause adverse impacts to various life stages of fish (Newcombe and Jensen 1996). Because eggs, larvae, and young-of-year of winter flounder are non-dispersive, spawning and nursery areas tend to be close together (Pearcy 1962; Crawford and Carey 1985). Adult winter flounder begin moving into shallow, nearshore marine and estuarine waters during winter months for spawning in mid-February and March, and continues to June (Pereira et al. 1999; Collette and Klein-MacPhee 2002). Winter flounder eggs are demersal, adhesive, and stick together in clusters; development generally takes two to three weeks before hatching (Pereira et al. 1999). Settlement of suspended sediments can smother winter flounder eggs (Pereira et al. 1999). The potential for adverse impacts to deposited winter flounder eggs should be minimized to the greatest extent possible.

Essential Fish Habitat Assessment

In order to satisfy consultation requirements of the EFH regulations [50 CFR 600.920(e)], an EFH assessment must be prepared to analyze the effects of the proposed action on EFH. The required contents of an EFH assessment include: 1) a description of the action; 2) an analysis of the potential adverse effects of the action on EFH and the managed species; 3) conclusions regarding the effects of the action on EFH; and 4) proposed mitigation, if applicable. Other information that should be contained in the EFH assessment, if appropriate, includes: 1) the results of on-site inspections to evaluate the habitat and site-specific effects; 2) the views of recognized experts on the habitat or the species that may be affected; 3) a review of pertinent literature and related information; and 4) an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH. Upon submittal of a complete EFH assessment, we will provide official conservation recommendations for the proposed project.

For this project, additional information should be included in the EFH assessment regarding the results of on-site inspections and an analysis of alternatives to the project as proposed should be provided. Specifically, benthic surveys should be completed within the proposed new dredge and marina expansion area, and alternatives that minimize new dredging and expansion within the lower intertidal and adjacent shallow-water habitats should be fully evaluated. Additionally, mitigation proposed to offset remaining adverse impacts to EFH should be included in the EFH assessment.

Conclusion

In summary, a completed EFH assessment is necessary to initiate consultation for this project. Specifically, an evaluation of benthic resources within the project footprint and an alternatives analysis are needed to complete the EFH assessment. Proposed mitigation to offset adverse impacts to EFH should be addressed and included in the assessment. This information is necessary for us to provide appropriate EFH conservation recommendations and complete our consultation with you for this project. Accordingly, we seek to extend both the comment period pursuant to Part II(4) of our MOA, as well as the consultation process pursuant to 50 CFR 600.920(i)(5) so that you may provide us with better information for our evaluation of impacts and the development of EFH conservation recommendations. Upon receipt of a complete EFH

assessment, we will require up to 30 days to review the assessment and develop EFH consultation recommendations. If you have any questions regarding the EFH consultation process, please contact Alison Verkade at 978-281- 9266 or alison.verkade@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: Lindsey Lefebvre, USACE
Max Tritt, PRD
Ed Reiner, EPA
John Logan, DMF
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC

References

Cargnelli LM, Griesbach SJ, Packer DB, Berrien PL, Johnson DL and Morse WW. 1999. *Essential Fish Habitat Source Document:* Pollock, *Pollachius virens,* Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-131.

Chang S, Berrien PL, Johnson DL and Morse WW. 1999. Essential Fish Habitat Source Document: Windowpane, *Scophthalmus aquosus,* Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-137.

Coen LD and Grizzle RE. 2007. The importance of habitat created by molluscan shellfish to managed species along the Atlantic coast of the United States. Atlantic States Marine Fisheries Commission. Habitat Management Series #8.

Collette BB, Klein-MacPhee G, eds. 2002. Bigelow and Schroeder's fishes of the Gulf of Maine, Third ed. Washington, DC: Smithsonian Institution Press. 748 p.

Crawford RE, Carey CG. 1985. Retention of winter flounder larvae within a Rhode Island salt pond, Estuaries 8: 217-227.

Forster S and Zettler ML. 2004. The capacity of the filter-feeding bivalve *Mya arenaria* L. to effect water transport in sandy beds. Marine Biology 144: 1183-1189.

Helfman, G., Collette, B. B., Facey, D. E., and Bowen, B. W. 2009. The diversity of fishes: biology, evolution, and ecology. John Wiley & Sons.

McDermott S, Burdick 0, Grizzle R and Greene J. 2008. Restoring Ecological Functions and Increasing Community Awareness of an Urban Tidal Pond Using Blue Mussels. Ecological Restoration 26(3): 254-262.

Nakamura Y and Kerciku F. 2000. Effects of filter-feeding bivalves on the distribution of water quality and nutrient cycling in a eutrophic coastal lagoon. Journal of Marine Systems 26(2): 209-221.

Newcombe, C. P. and O. T. Jenson. 1996. Channel suspended sediment and fisheries: asynthesis for quantitative assessment of risk and impact. North American Journal of Fisheries Management 16: 693-727.

Pearcy WG. 1962. Ecology of an estuarine population of winter flounder, *Pseudopleuronectes americanus* (Waldbaum). Part I-IV, Bulletin of the Bingham Oceanography Collection 18(l): 5-78.

Pereira JJ, Goldberg R, Ziskowski JJ, Benien PL, Morse WW, Johnson DL. 1999, Essential Fish habitat source document: winter flounder, *Pseudopleuronectes americanus*, life history and characteristics. NOAA Technical Memorandum NMFS-NE-I38. Northeast Fisheries Science Center, Woods Hole, MA.

Stevenson, DK, S Tuxbury, MR Johnson, C Boelke. 2014. Shallow Water Benthic Habitats in the Gulf of Maine: A Summary of Habitat Use by Common Fish and Shellfish Species in the Gulf of Maine. Greater Atlantic Region Policy Series 14-01. NOAA Fisheries Greater Atlantic Regional Fisheries Office. 77pp.

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

Stephan Ryba, Chief
Regulatory Branch
U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278-0090

AUG 21 2017

RE: NAN-2016-01166; Amtrak/New Jersey Transit Hudson Tunnel Project, Hudson River, NJ and NY

Dear Mr. Ryba:

We have reviewed Public Notice number NAN-2016-01166-WCA dated July 7, 2017. The notice describes an application by Amtrak and New Jersey Transit (NJT) to construct a new, two-track passenger rail tunnel under the Hudson River between New Jersey and New York. The project, known as the Hudson Tunnel Project (HRT), also includes the rehabilitation of the existing North River Tunnel (NRT) and rail infrastructure improvements to connect the new tunnel to the existing Northeast Corridor. The HRT will extend from Secaucus, NJ, beneath the Palisades (North Bergen and Union City), the Hoboken waterfront, and Hudson River to connect with New York Penn Station.

The US Federal Rail Administration (FRA) is the lead federal agency for this project and has initiated consultation with us pursuant to the requirements of the Magnuson Stevens Fisheries Management and Conservation Act (MSA). The MSA requires federal agencies to consult us on projects such as this that may affect EFH adversely. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments, lists the required contents of EFH assessments, and generally outlines each agency's obligations in this consultation procedure.

In a letter to FRA dated June 12, 2017, we provided the following conservation recommendations; we ask that you include these as special conditions in any permit issued to Amtrak and NJT for this project.

1. No in-water work from November 15 to April 15 to minimize impacts to overwintering striped bass.

2. Avoid removing or installing sheetpiles from March 1 to June 30 to minimize impacts to migrating anadromous species including alewife, blueback herring and striped bass.

3. Provide compensatory mitigation for unavoidable impacts to tidal wetlands. A compensatory mitigation plan should be required that documents avoidance and minimization of the loss of tidal wetlands and provides sufficient acreage to offset the habitat losses.

NOAA

MB 8/23/17

In addition, subsequent to our comment letter to FRA, discussions occurred between FRA and resource agencies regarding mitigation for jet-grouting and sediment stabilization of approximately 1.51 acre of benthic habitat. Approximately 0.74 acres of river bottom would be hardened as a result of the Soilcrete process and elevated above the current depths. The remaining 0.77 acres would be scoured by jet-grouting. Because the ecological effects of the use of Soilcrete are difficult to anticipate, and it is unclear if any effects that do occur would be temporary or permanent, we agreed that monitoring of the site to evaluate the recovery of the impacted benthic habitat would be acceptable in lieu of traditional compensatory mitigation for this activity. The proposed monitoring of the entire impacted area would occur for five years post-construction and would include the submittal of annual monitoring reports. The specifics of the monitoring plan will be developed by the applicant in coordination with ACOE, NMFS, and New York State Department of Environmental Conservation (NYSDEC).

We therefore add an additional conservation recommendation to the above list, and ask that you include it as a special condition in the permit issued to the applicant for this project.

4. Develop a five-year monitoring plan to evaluate benthic community recovery of the river bottom impacted by the use of Soilcrete and jet grouting. The monitoring plan should be developed with input from ACOE, NMFS and NYDEC and will include the submittal of annual reports.

We will continue to work with FRA, NJ Transit and ACOE as the plans for this project progress and additional details on the impacts to wetlands within the Hackensack Meadowlands are more fully defined. As additional information on the project schedule and construction details are developed, we will evaluate whether or not the full, recommended seasonal restrictions are warranted, based on available data on the timing of migration of anadromous fishes in the project area, or if there are other options to minimize adverse effects to migrating anadromous fishes.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to the EFH conservation recommendations, including a description of 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 these conservation 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 effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act

Federally listed species may be present in the project area. Coordination between FRA and our Protected Resources Division pursuant to Section 7 of the Endangered Species Act (ESA) is ongoing. Our Protected Resources Division will be proving comments on this project separately.

Questions regarding the status of their review should be directed to Daniel Marrone at (978) 282-8465 or daniel.marrone@noaa.gov.

We look forward to our continued coordination with your office on this project as it moves forward. If you have any questions or need additional information, please do not hesitate to contact Ursula Howson at ursula.howson@noaa.gov or (732) 872-3116.

Sincerely,

Louis A. Chiarella,
Assistant Regional Administrator
for Habitat Conservation

NY ACOE – S. Ryba
NOAA OPR – M. Lennox
PRD – D. Marrone
NEFMC – T. Nies
MAFMC – C. Moore
ASMFC – L. Havel
NYDEC – D. McReynolds
FRA – A. Castelli

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

AUG 25 2017

Ms. Jennifer McCarthy
Chief, Regulatory Division
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Re: NAE-2017-1193, Francis J. Santos, Wharf and Pier Expansion Project, Provincetown, MA

Dear Ms. McCarthy:

We have reviewed the Public Notice for Francis J. Santos to conduct work within Provincetown Harbor in Provincetown, MA. The proposed work includes the construction of a 52' x 216' wharf with a 20' x 30' dock master's building, an 8' x 617' pier, a 5' x 40' ramp, relocation of an existing 90 foot floating dock system, and the installation of 155 steel piles to support the new pier and dock system. Approximately 0.40 acres of eelgrass habitat that is designated as essential fish habitat (EFH) for multiple managed fish species will be impacted within the footprint of the proposed work. The plans included in the Public Notice illustrate that eelgrass beds exist throughout the proposed project footprint. No mitigation for the proposed work was included in the Public Notice.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require federal agencies to consult with one another on projects such as this. Insofar as a project involves EFH, as this project does, 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 the relevant consultation procedure. We also note your permitting obligations at 33 CFR Parts 320 through 330, and particularly at 40 CFR Part 230, as well as the process mutually agreed upon in our Memorandum of Agreement (MOA) concerning Section 404(q) of the Clean Water Act. We offer the following comments and recommendations on this project pursuant to the above referenced regulatory construct and to invoke the elevation process outlined in Part IV, Paragraph 3(b), of our interagency MOA.

General Comments

Ecosystem functions and importance of SAV
Submerged aquatic vegetation is known to play a critical ecosystem role. Highly valued as a refuge, nursery ground and food resource for a number of commercially important fin and shellfish (Thayer et al. 1984, Kenworthy et al. 1988), eelgrass also stabilize sediments by buffering the erosive force of waves and currents (Fonseca and Cahalan 1992). Recent studies have demonstrated the importance of seagrasses as long-term carbon sinks, sequestering carbon at high rates and storing them in the marine sediments (Pendleton et al. 2012, Fourqurean et al. 2013, Howard et al. 2017). A recent study conducted in New England, found sediments within eelgrass beds store significantly more carbon when compared to adjacent unvegetated reference sites (Colarusso et al. 2016). In addition to losing critical functions as marine habitats, degradation and loss of seagrasses could also

mb 8/29/17

result in substantial releases of carbon into the atmosphere (Pendleton et al. 2012, Fourqurean et al. 2013).

Due to its important role within the marine ecosystem for spawning, nursery cover and forage areas for fish and wildlife, eelgrass has been designated as a "Special Aquatic Site" by the US Environmental Protection Agency under Section 404(b)(1) of the Federal Clean Water Act. Furthermore, the Mid-Atlantic Fishery Management Council has designated areas of submerged aquatic vegetation (SAV), when associated with EFH for juvenile and adult summer flounder, as a Habitat Area of Particular Concern (HAPC) under Amendment 13 of the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. HAPCs are subsets of EFH identified based on one or more of the following considerations: 1) the importance of the ecological function, 2) extent to which the habitat is sensitive to human-induced degradation, 3) whether and to what extent, development activities are stressing the habitat type, or 4) rarity of habitat type (50 CFR 600.815(a)(8)). Impacts to summer flounder HAPC should be avoided to the greatest extent possible.

Eelgrass also provides complex habitat that has been demonstrated to mediate spatial distribution and survivorship of juvenile Atlantic cod. Significant spatial distribution and shoaling behavior differences by juvenile cod have been identified based on habitat complexity (Grant and Brown 1998, Gotceitas and Brown 1993, Gotceitas et al. 1995 and 1997, Anderson 2007). Each of the studies found that cod were more abundant and their spatial distribution was mediated under the threat of predation within complex vegetated habitats and rocky habitats compared to unvegetated sand and soft bottom habitats (Grant and Brown 1998, Gotceitas and Brown 1993, Gotceitas et al. 1995 and 1997, Anderson et al. 2007). Multiple studies have also demonstrated that despite the potential that juvenile cod may initially settle to the substrate indiscriminately, age-0+ juveniles are more abundant in complex habitats (e.g. rocky or vegetated habitats). Whether this is due to active movement of post-settlement juvenile cod into complex habitats or due to higher survivorship rates in complex habitats is unknown (Lough et al., 1989, Colton 1978, Collette and Klein-MacPhee 2002). Further, complex habitats have been well documented to significantly increase juvenile survivorship and mediate the spatial distribution of Atlantic cod under the threat of predation in comparison with unvegetated soft substrate habitats (Fraser et al. 1996, Gotceitas and Brown 1993, Lindholm et al. 1998 and 2001, Theodorou 2013).

In August of 2014, we issued an update on the stock assessment for Gulf of Maine (GOM) Atlantic cod through 2013. The indicators of stock condition for GOM cod declined or worsened in 2013, and the spawning stock biomass levels are estimated to be at 3 to 4 percent of the biomass target for maximum sustainable yield with biomass at all-time lows. The results of this stock assessment lead to the implementation of Emergency Gulf of Maine Cod Management Measures on November 13, 2014. At the time of the GOM stock assessment update, the stock status report also estimated the Georges Bank (GB) spawning stock biomass at very low levels, 7 percent of the spawning stock biomass target. The latest stock status report for Atlantic cod GOM and GB stocks estimate the spawning stock biomass remain at 4 and 7 percent, respectively, of the target for maximum sustainable yield.

Atlantic cod are an iconic species in New England waters and a highly sought after catch for recreational fishermen. We recently published a report on the economics of coastal recreational fisheries in the United States for 2013 (Hutt et al. 2015). In New England, the recreational marine

bait and tackle industry was estimated to contribute $200 million in total sales, $78.9 million in income, and 1,256 jobs to the local economy. Atlantic cod was reported to be the fifth greatest generator of sales (Hutt et al. 2015). Given the state of Atlantic cod stocks and the economic importance of the species to recreational and commercial fisheries, it is essential to minimize adverse impacts to habitats that can support and increase survivorship of critical life stages for this stock.

Threats to SAV and Project Impacts

In many locations along the east coast, eelgrass coverage has declined by fifty percent or more since the 1970's (Thayer et al. 1975, Short et al. 1993 and Short and Burdick 1996). In Massachusetts, eelgrass is also in significant decline, particularly on the south coast, Cape Cod and Buzzards Bay. These widespread losses may exacerbate the problem as fewer beds are available to provide new recruits to help sustain the populations (Costello and Kenworthy 2011). Loss of eelgrass is attributed to reduced water quality and clarity resulting from elevated inputs of nutrients or other pollutants, such as suspended sediments, and direct disturbances (Kemp et al. 1983, Short et al. 1993, Short and Burdick 1996, Orth et al. 2006). Losses of eelgrass and bed quality degradation resulting from increased boating activity and dock shading impacts, both directly underneath and adjacent to piers, has also been well documented (Burdick and Short 1995, Burdick and Short 1999, Short et al. 2009). Placement of floating docks within SAV meadows had been shown to result in the complete loss of SAV in the vicinity of the floating structure (Burdick and Short 1999, Short et al. 2009). Given the widespread decline in eelgrass beds, any additional loss to this habitat can significantly affect the resources that depend on these meadows.

The proposed project will result in adverse impacts to SAV beds that would occur through direct and indirect impacts resulting from the proposed pier expansion and floating dock relocation. Direct impacts from the proposed pier installation and floating dock relocation would occur as a result of shading, physical disturbance (e.g. prop dredging, vessel grounding, etc), and pile installation. Indirect impacts from installed piles and vessel operations will adversely affect adjacent eelgrass beds due to degraded water quality, increased turbidity and sedimentation, and altered hydrology impacts. Due to the important role eelgrass plays in sensitive life history stages of multiple managed fish species, particularly summer flounder and Atlantic cod, we have determined the proposed project will result in substantial and unacceptable impacts on aquatic resources of national importance (ARNI).

Essential Fish Habitat Conservation Recommendations

The project area has been designated as EFH under the MSA for multiple federally-managed species including Atlantic cod and summer flounder. Based on the information provided in the Public Notice, the currently proposed wharf and pier expansion will result in a loss of eelgrass habitat within Provincetown Harbor. Based on the above rationale, we have determined that the proposed project will have substantial and unacceptable impacts on EFH. We recommend pursuant to Section 305(b)(4)(A) of the MSA and Part IV, Paragraph 3(b) of the MOA, that the ACOE adopt the following EFH Conservation Recommendations:

1) All direct and indirect impacts to eelgrass habitat should be avoided.
2) Alternatives to the proposed project that avoid impacts to eelgrass habitat should be fully evaluated and pursued.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to this EFH conservation recommendation, including a description of measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendation, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendation. 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 effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendation.

Endangered Species Act

A consultation, pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended, may be necessary. Under the ESA, if the proposed project has the potential to affect listed species or designated critical habitat, and it is being approved, permitted or funded by a Federal agency, the lead Federal agency, or their designated non-Federal representative, is responsible for determining whether the proposed action may affect the listed species or designated critical habitat. In this situation, you are responsible for this determination. If you determine the proposed action may affect listed species under our authority, the determination along with justification for your determination should be sent to the attention of the ESA Section 7 Coordinator at nmfs.gar.esa.section7@noaa.gov (NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (PRD), 55 Great Republic Drive, Gloucester, MA 01930). After reviewing this information, we would then be able to conduct a consultation under section 7 of the ESA. If you determine the proposed action will not affect listed species under our authority, no further consultation with us is necessary. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Zach Jylkka at Zachary.Jylkka@noaa.gov or (978) 282-8467.

Conclusion

In summary, we have determined that this project will have substantial and unacceptable effects on aquatic resource of national importance. We look forward to your response to our EFH conservation recommendation pursuant to both Section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k), as well as Part IV, Paragraph 3(c) of the MOA. Should you have any questions about this matter, please contact Christopher Boelke at 978-281-9131 or christopher.boelke@noaa.gov

Sincerely,

John Bullard
Regional Administrator

cc: Zachary Jylkka, PRD
Crystal Gardner, USACE
Ed Reiner, USEPA
Phil Colarusso, USEPA
Eileen Feeney, MADMF
John Logan, MADMF
Robert Boeri, MACZM
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC

References

Anderson, J. L., Laurel, B. J., and Brown, J. A. 2007. Diel changes in behaviour and habitat use by age-0 Atlantic cod (*Gadus morhua L.)* in the laboratory and field. Journal of Experimental Marine Biology and Ecology 351(1),:267-275.

Colarusso P., Simpson, J., Novak, A., Ford, K., DiBona, P., Vella, P., Deane, J., and Stanley, S. 2016. Blue Carbon, Green Eelgrass: Estimating Carbon Storage in Eelgrass in the Gulf of Maine. Report funded by U.S. EPA Climate Ready Estuaries Program. August 2016.

Collette BB, Klein-MacPhee G, 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. Washington, DC: Smithsonian Institution Press.

Colton, J. B. 1978. Principal spawning areas and seasons of the Atlantic cod (Gadus morhua) in the Gulf of Maine and Middle Atlantic Bight. US Natl. Mar. Fish. Serv., Northeast Fish. Cent. Woods Hole Lab. Ref, (78-66), 5.

Costello, C.T. and W.J. Kenworthy. 2011. Twelve-year mapping and change analysis of eelgrass (Zostera marina) areal abundance in Massachusetts (USA) identifies statewide decline. Estuaries and Coasts 34:232-242.

Fonseca, M.S. and Cahalan, J.A. 1992. A preliminary evaluation of wave attenuation by four species of seagrass. Estuarine, Coastal and Marine Science 35: 565-576.

Fourqurean, J. W., C. M. Duarte, H. Kennedy, N. Marba, M. Holmer, M. Angel Mateo, E. T. Apostolaki, G. A. Kendrick, D. Krause-Jensen, K. J. McGlathery and 0. Serrano (2012). Seagrass ecosystems as a globally significant carbon stock. Nature Geoscience 5(7): 505-509.

Fraser, S., Gotceitas, V., and Brown, J. A. 1996. Interactions between age-classes of Atlantic cod and their distribution among bottom substrates. Canadian Journal of Fisheries and Aquatic Sciences 53(2):305-314.

Grant, S. M., and Brown, J. A. 1998. Nearshore settlement and localized populations of age 0 Atlantic cod (*Gadus morhua*) in shallow coastal waters of Newfoundland. Canadian journal of fisheries and aquatic sciences 55(6):1317-1327.

Gotceitas, V., and Brown, J. A. 1993. Substrate selection by juvenile Atlantic cod (*Gadus morhua*): effects of predation risk. Oecologia 93(1): 31-37.

Gotceitas, V., Fraser, S., and Brown, J. A. 1995. Habitat use by juvenile Atlantic cod (*Gadus morhua*) in the presence of an actively foraging and non-foraging predator. Marine Biology 123(3):421-430.

Gotceitas, V., Fraser, S., and Brown, J. A. 1997. Use of eelgrass beds (*Zostera marina*) by juvenile Atlantic cod (*Gadus morhua*). Canadian Journal of Fisheries and Aquatic Sciences 54(6):1306-1319.

Howard, J., Sutton-Grier, A., Herr D., Kleypas, J., Landis, E., Mcleod, E., Pidgeon, E., and Simpson, S. 2017. Front Ecol Environ 15(1): 42-50, doi:l0.1002/fee.1451

Hutt, Clifford, Sabrina Lovell, and Scott Steinback. 2015. The Economics of Independent Marine Recreational Fishing Bait and Tackle Retail Stores in the United States, 2013. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-F/SPO-151, 110 p.

Kemp W.M., W.R. Boynton, J.C. Stevenson, R.R. Twilley, and J.C. Means. 1983. The decline of submerged vascular plants in upper Chesapeake Bay: Summary of results concerning possible causes. Marine Technology Society Journal 17:78-89.

Kenworthy, W.J., Thayer, G.W., and Fonseca, M.S. 1988. The utilization of seagrass meadows by fishery · organisms. In:Hook, D.D., McKee, W.H., Smith, H.K., Gregory, J., Burrell, V.G., DeVoe, M.R., Sojka, R.E., Gilbert, S., Banks, R., Stolzy, L.H., Brooks, C., Matthews, T.D., and Shea, T.H., editors. The Ecology of Wetlands: Volume l. pp. 548-560.

Lindholm, J., P. J. Auster, and L. Kaufman. 1999. Habitat-mediated survivorship of juvenile (0-year) Atlantic cod (Gadus morhua). Marine Ecology Progress Series 180:247–255.

Lindholm, J., P.J. Auster, M. Ruth and L. Kaufman. 2001. Modeling the effects of fishing and implications for the design of marine protected areas: juvenile fish responses to variations in seafloor habitat. Conservation Biology 15: 424-437.

Lough, R. G., P. C. Valentine, D. C. Potter, P. J. Auditore, G. R. Bolz, J.D. Neilson, and R. I. Perry. 1989. Ecology and distribution of juvenile cod and haddock in relation to sediment type and bottom currents on eastern Georges Bank. Mar. Ecol. Prog. Ser. 56:1-12.

Orth, R.J., T.J.B. Carruthers, W.C. Dennison, C.M. Duarte, J.W. Fourquean, K.L. Heck, A.R. Hughes, G.A. Kendrick, W.J. Kenworthy, S. Olyarnik, F.T. Short, M. Waycott, and S.L. Williams. 2006. A global crisis for seagrass ecosystems. BioScience 56(12):987-996.
Pendleton L, Donato D.C., Murray B.C., Crooks S., Jenkins W.A., et al. 2012. Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. PLoS ONE 7(9): e43542. doi: 10.1371/journal.pone.0043542

Short, F.T. and D.M. Burdick. 1996. Quantifying eelgrass habitat loss in relation to housing development and nitrogen loading in Waquoit Bay, Massachusetts. Estuaries 19:730-739.

Short, F.T., D.M. Burdick, J. Wolfe, and G.E. Jones. 1993. Eelgrass in estuarine research reserve along the East Coast, U.S.A., Part I: Declines from pollution and disease and Part II: Management of eelgrass meadows. NOAA- Coastal Oceans Program Publ. 107 pp.

Thayer, G.W., Kenworthy, W.J., and Fonseca, M.S. 1984. The ecology of eelgrass meadows of the Atlantic Coast: a community profile. U.S. Fish and Wildlife Service, FWS/OBS-84/02.

Thayer, G.W., Wolfe, D.A., and Williams, R.B. 1975. The impact of man on seagrass systems. American Scientist 63: 288-296.

Theodorou, P., Snorrason, S. S., and Ólafsdóttir, G. Á. 2013. Habitat complexity affects how young of the year Atlantic cod Gadus morhua perceive predation threat from older conspecifics. Journal of fish biology 82(6):2141-2146.