



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
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October 25, 2021

James Bennett
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RE: BOEM's Response to NOAA EFH Conservation Recommendations for the South Fork Project

Dear Mr. Bennett:

We received your letter dated October 7, 2021, in response to the Essential Fish Habitat (EFH) conservation recommendations (CRs) we provided to you on June 7, 2021. In response to our first CR in that letter, you submitted an EFH addendum to us on July 26, 2021, to provide further clarification on the proposed project. After review of the EFH addendum, we provided additional comments and CRs on August 31, 2021. Your October 7th letter responds to our CRs offered on June 7th and August 31st.

The South Fork Project is proposed on Cox Ledge, a sensitive ecological area that provides valuable habitat for a number of federally managed fish species and other marine resources. Based on our Northeast Fisheries Science Center's fisheries science expertise and supporting peer-reviewed publications, this project has a high risk of population-level impacts on Southern New England Atlantic cod. Our EFH CRs for this project are intended to minimize these adverse impacts. As outlined in your letter, BOEM is not planning to adopt or to only partially adopt a number of these recommendations. For some of the recommendations, operational decisions are being deferred to a future process (e.g., a requirement on the applicant to prepare a real-time adaptive acoustic monitoring plan for cod aggregations and subsequent requirement to avoid activities in areas with those aggregations). We appreciate the ability to continue to participate in the design of potential EFH mitigation measures but have continuing concerns that we recommend BOEM address as either the ROD is finalized or these subsequent processes are implemented.

Time of Year Restriction for Atlantic Cod (CR#6)

Your response indicates that you are not adopting all our recommendations regarding time of year restrictions to protect spawning cod on Cox Ledge. We understand that BOEM has replaced our static seasonal restriction to protect spawning cod with an untested adaptive approach requiring the applicant to prepare an acoustic monitoring plan and, based on that monitoring, to avoid activities that would disrupt spawning aggregations. Below we point out some of our concerns about the assumptions BOEM has made regarding both the biological and operational rationales for not fully adopting our recommendations as this issues will need to be



addressed for both the adaptive management regime being adopted by BOEM and for future EFH consultations in this area; and to identify areas where BOEM may wish to strengthen its documentation of its decision in the upcoming Record of Decision.

Pile Driving

Regarding pile driving, your decision is based in part on an assumption that cod spawning behavior will occur 4-6 hours after sunset and that pile driving would not have a lingering effect on this behavior given that pile driving could at the latest begin 1.5 hours before sunset and would only be expected to continue for a predicted maximum of 250 minutes (about 3.5 hours after sunset). You state that “acoustic masking” is the main environmental stressor from this activity and that the effect “ceases as soon as the noise source stops...., there is no lingering effect.” No support is provided for this conclusion in your October 7 letter and the conclusion does not appear to be supported by the peer-reviewed literature. Specifically, peer-reviewed literature indicates that elevated noise may cause cod to flee, change swim speed and direction, or freeze; and that this behavioral impact can persist well beyond the cessation of the generated noise (Andersson et al. 2017; Engas et al. 1996; Mueller-Blenkle et al. 2010). In addition to the vulnerability of southern New England cod spawning aggregations to disruptions that we presented in our EFH letter dated June 7, 2021, other peer-reviewed publications from Europe have also evaluated the potential effects of pile driving for offshore wind farm development during cod spawning seasons. These studies determined that such activities are likely to have substantial adverse impacts on cod aggregations and result in the dispersal of such aggregations (Rossington et al. 2013; Hammar et al. 2014). Further, Hammer et al. (2014) evaluated the potential effects of wind farm construction on a genetically and ecologically distinct cod population, similar to the southern New England region cod population that relies on Cox Ledge for spawning. Both pile driving and cable laying activities were identified as the most impactful project activities, with pile driving identified as the most detrimental for population level effects (Hammer et al. 2014).

In addition, your assumption does not appear to consider cod mating and spawning behaviors. Atlantic cod spawning involves a complex sequence of competition and courtship behaviors that extend over long periods of time, with individual residence time within aggregations projected to last several weeks, well beyond the diel pattern you noted in your October 7th letter of when actual spawning occurs (Rowe and Hutchings 2003; Windle and Rose 2006; Zemekis et al. 2014). Further, the long-term to permanent abandonment of spawning locations resulting from repeated stressors has been documented in Atlantic cod (Ames 2004). Cod spawning activity is a highly structured social process that includes behaviors during both daytime and nighttime and thus simply restricting nighttime pile driving will not avoid significant disruption to spawning. While we appreciate that BOEM had determined to restrict pile driving from January 1 to April 30 and potentially from December 1 to December 31, pile driving noise, particularly at the start of the spawning season (November and December), could prevent aggregations from forming, disrupt existing aggregations, and/or cause cod to leave or abandon the area altogether. Cod demonstrate site fidelity during spawning, so a single year abandonment of those locations may have significant implications for recruitment. We know that November and December are critical times for spawning activity in this region (Dean et al. 2021, *in review*) and restricting pile driving during the spawning season is necessary to avoid population effects

(Hammar et al. 2014).

We note that the assumption of no lingering effect and minimal impacts to cod spawning aggregations is inconsistent with the assessment of impacts presented in both your FEIS and EFH Assessment for the project. In both documents, you determined that pile driving would not only result in the potential masking effects discussed in your response, but in your FEIS you go on to state that pile driving may “alter behavior in ways that could disrupt localized cod spawning aggregations (Dean et al. 2012).” Your EFH Assessment (April 2021) states: “...underwater noise sufficient to alter behavior or cause [temporary threshold shift] could have disruptive effects on cod spawning (Dean et al. 2012).” We note that your interpretation of the implications of Dean et al. (2012) presented in your response to our CRs is inconsistent with your analysis in the FEIS and EFH Assessment. Given the emerging data on the significance of Cox Ledge for spawning Southern New England cod, it is important we maintain a consistent and common understanding of the potential effects of offshore wind development to this spawning population. This is a high priority given the cumulative and population level impacts this project and additional proposed development on Cox Ledge could have on this important cod population.

In addition, cod biomass is at historic lows, and impacts to spawning success could have long-term population impacts for the species. Few Atlantic cod in the region live longer than six years and individuals may only have two to three opportunities to participate in spawning groups. Thus, population level impacts are a high risk of this activity, which is expected to occur over multiple consecutive spawning seasons for this and other projects on and adjacent to Cox Ledge. Further, as discussed in our June 7th letter, the Georges Bank cod stock, of which the southern New England population is a critical component, is in very poor condition. The most recent stock status update estimates the Georges Bank sustainable spawning stock biomass at only 7 percent of the target for maximum sustainable yield (National Marine Fisheries Service - 3rd Quarter 2021 Update Table A. Summary of Stock Status for FSSI Stocks). While information indicates that cod in southern New England, unlike other spawning components, has increased in abundance during the last 20 years (Langan et al. 2020), the Georges Bank stock overall remains at historic lows. Therefore, spawning impacts on the southern New England stock component will likely affect the entire Georges Bank stock and further constrain stock recovery. Thus there is a heightened need to minimize adverse impacts of this project on southern New England cod.

Other Bottom Tending Construction Activities

In your October 7th response, you draw a second conclusion related to the consequences of bottom tending construction activities for cod spawning aggregations. Specifically, you state that cable laying activities are unlikely to result in permanent dispersion of an aggregation, as these activities would be limited in duration and areal extent at any location. To support this determination you cite Morgan et al. (1997), a Canadian trawl study that was conducted within a large, robust Atlantic cod spawning aggregation (5 km x 25 km in area). Reliance on the effects of a single otter trawl pass through a large spawning aggregation to evaluate potential effects to cod spawning aggregations in this region from cable laying activities, is not well supported. Specifically, the cod spawning aggregations on Cox Ledge, as compared to the Canadian aggregation in the Morgan et al. (1997) study, have been identified by recent research as being highly perturbed and sparse in their distribution (personal communication, Van Parijs 2021). Further, cable installation, as detailed in the

COP (Section 3.1.3.3), requires multiple, consecutive bottom-tending disturbances within the same area. In addition to the cable installation equipment itself, multiple pre-lay installation operations and post-lay operations are required, including seafloor preparation, installation trials, and the installation of cable protection material in areas where cable burial target depth is not achievable. Seafloor preparation requires multiple steps, including a pre-lay grapple run and boulder relocation that may require multiple passes and/or deployment of specialized tools to the seafloor. It is also expected that approximately five to ten cable installation test trials will occur in different areas along the cable route. Further, geophysical surveys would occur throughout the installation, potentially including multibeam echosounder (MBES), side scan sonar, sub-bottom profiler or imager, cable tracking equipment, and/or visual surveys. The suggestion that these activities are analogous to a single trawl pass is unfounded. As discussed above, Hammar et al. (2014), also recommended a time of year restriction for cable laying activities during the cod spawning season to avoid and minimize impacts to spawning activity.

In your response, you also make the comment that fishing is currently allowed during cod spawning in the project area as justification for not incorporating the recommended time of year restriction. You note that the science on the importance of this area for cod spawning is emerging, and ongoing evaluation of the cod stock structure in the region could result in changes to the management of fisheries in this area. However, it does not appear that you have considered either: 1) the extent and composition of fisheries in the area; or 2) the additive adverse effects of pile driving and bottom-tending construction activities, including cable laying activities. As you know, the New England Fishery Management Council is in the midst of a multi-year process to evaluate cod stock structure, including considering designating a distinct stock for cod around Cox Ledge based on peer reviewed research. Stock designation is the first step toward conserving and sustainably managing sub-populations through management measures that include spawning season fishing restrictions, among others, as implemented for the existing cod stocks in the Gulf of Maine and Georges Bank. Pile driving noise impacts a far greater area than individual fishing events, with the potential to disrupt cod spawning aggregations at one time over an area miles in diameter. Further, as described previously, the inter-array cable installation will require multiple steps and elements that are not analogous to mobile bottom-tending fishing gear. In addition, fishing is regulated to address impacts from fishing activity and minimize impacts to spawning cod, and stock assessments account for fishing mortality. The fact that fishing may occur in this area is not an appropriate justification for not implementing protective measures to reduce impacts of construction activities on spawning Atlantic cod.

Operational Feasibility

In your response to our CR, you also suggest time of year protective measures for Atlantic cod may not be economically and technically feasible, and could result in an additional construction season, which would create further impacts to other marine resources. The project schedule information you referenced from the COP (Table 1.5-1) in your October 7th response to our CRs does not appear to support this assessment. A similar table that supports this schedule is also provided in Table 2.2 in the EFH assessment. These construction timelines state that neither pile driving nor bottom disturbing activity in the lease area are expected to occur in quarter 1 (Q1), which includes January through March. While the table in the COP suggests turbine foundation installation may occur in Q4 (October through December), Orsted has indicated to NMFS that monopile installation will

likely occur in Q2 and Q3 (April through September) of 2023. Therefore, restrictions on pile driving to protect spawning cod would not be expected to cause schedule delays because, by Orsted's own estimation and plan, these activities would only occur outside of our recommended time of year restriction. On October 6, 2021, you provided us with a letter from Orsted to BOEM, which suggests bottom disturbing activities are now proposed in Q1. Rather than considering opening a restriction at the end of the spawning season (potentially in March, for example), which would reasonably support project activities while minimizing impacts on cod spawning, you state that our recommended time of year restriction is infeasible. It is not clear what this current determination is based on and we encourage BOEM to work with applicants at an earlier stage in the process to better document operational constraints so that both agencies can better address and design mitigation measures. If other projects are similarly slated to have a significant amount of activities during peak cod spawning periods, these cumulative effects will lead to a population level decline of southern New England cod. We encourage BOEM to more fully address these considerations in its Record of Decision on this project and in future projects.

Adaptive Management

While we have identified concerns with some of the underlying rationale for BOEM's determination on this issue, BOEM has recognized the potential for significant disruptions to cod spawning and has proposed an alternative mitigation measure which would require the applicant to prepare a real-time adaptive acoustic monitoring plan to detect large aggregations of adult cod and/or passive acoustic monitoring to detect Atlantic cod spawning vocalizations. We will be allowed to comment on the plan and you have indicated that you will require the applicant to avoid certain Project activities in any area with aggregations of Atlantic cod indicative of spawning behavior. We do not know how effective such a measure would be in avoiding or minimizing impacts to cod spawning. Effectiveness will rely on multiple factors, including the specifications of the monitoring design and methodology. This approach also assumes that cod will be acoustically detectable prior to the initiation of any avoidance behaviors pile driving or bottom disturbances in the lease area may elicit. To help ensure the monitoring plan is designed to detect cod in the area, we recommend that you require the monitoring plan be developed in coordination with NMFS rather than simply allowing for NMFS comment after it is submitted to BOEM.

Acoustic monitoring (CR#8 and CR#10)

Given the importance of Cox Ledge for a number of marine species, particularly spawning Atlantic cod, it is critical to monitor the specific effects of these changes in the acoustic environment. While we appreciate the incorporation of sound verification measures, you indicate that you are not adopting our recommendation to monitor baseline construction and operations changes to the soundscape, but indicate you will consider such monitoring for funding in your annual Studies Development Plan. We note that in the South Fork FEIS, (#70; page G-16) you include a monitoring plan that substantially addresses our CR#8, but focuses on the monitoring of marine mammals and protected species. It is not clear why you have not noted this in your October 7, 2021 letter, or why this monitoring was not expanded to include monitoring for Atlantic cod spawning activity, which would partially address our CR#10. BOEM could simply require the data collected to also be evaluated for

acoustic conditions and other soniferous species, such as Atlantic cod. We would request that you expand and require the acoustic monitoring data collected for marine mammals also be evaluated for soniferous fish species, particularly during the Atlantic cod spawning season.

In your response you also note that you are looking to expand the cod study (CR #10). Expanding the current study, both in spatial extent, and through additional passive acoustic monitoring gliders and biological sampling, would help to address outstanding concerns and data gaps regarding the full extent of cod spawning activity within and surrounding the Southern New England wind energy areas. Once project construction begins, the ability to distinguish between natural changes/shifts in spawning aggregations and those resulting from project construction will be substantially compromised. Furthermore, given the emerging studies demonstrating the importance of this area for Atlantic cod, it is critical we understand the extent of spawning activity in this area prior to commencement of large scale development. Absent such information, we cannot understand the true effects of these projects or protective measures necessary to reduce these impacts.

Habitat Impact Minimization (CR #2 & #3)

As you know, we identified five turbine locations (#1, #5, #15, #16A, and #17A) that will have the most negative impacts on complex habitats on Cox Ledge. These turbine locations were identified in our CR#2 and in your FEIS for the project, and we recommended that these turbine locations be removed from further consideration. You indicate that you will partially implement this suggestion by removing three of five locations (#5, #16A, and #17A) and have determined that the other two turbines (#1 and #15) cannot be removed due to economic and technical reasons. However, you have indicated that you intend to remove two different turbine locations (#6 and #9). Removing turbines #6 and #9 instead of #1 and #15 will provide some benefits to soft-bottom habitats but does not provide an equivalent reduction of impacts to complex habitat.

Overall, this project will result in substantial permanent impacts to complex habitats on Cox Ledge. While the October 7 letter is clear that the determination is based primarily on operational and technical issues that were not apparent until late in the application process, we are concerned both for this project and future projects that your determination appears to be influenced by habitat data and delineations that both NMFS and BOEM had previously agreed were to be used for illustrative and approximate calculations in the FEIS only. These data do not have the sampling resolution to determine site-specific impacts or analyze potential micrositing of turbine locations and inter-array cables. This mutual understanding of the data is reflected in your response to CR#3 where you state that micrositing of turbine locations and associated inter-array cables will be based upon multibeam backscatter data, consistent with our recommendations in CR#3. Specifically, you state that turbines and associated inter-array cables should be microsited into areas of low multibeam backscatter returns. The calculations of habitat impacts identified in your response to our CR#2 does not appear to consider the data limitations.

In your response to our CR#3, you also site economic and technical reasons for not micrositing turbine locations #2, #12, #13, #14, and the offshore substation to areas outside of complex habitats. In your response to CR#14, you indicate that confirmed unexploded

ordnance locations affected micrositing feasibility. Given that you have concluded that economic and technical constraints associated with constructing on Cox Ledge will prevent a more direct reduction of habitat impacts, we recommend that in this and future projects, BOEM mitigate for areas where habitat impacts are not being minimized and consider such operational constraints earlier in the approval process, when the applicant may have a better ability to alter operations to avoid such harm.

As indicated, the decision to remove turbine locations #6 and #9 instead of turbine locations #1 and #15, and the decision to not microsite other turbine locations, will result in impacts to complex habitats. We do appreciate that to offset these impacts, you will require additional habitat information be collected at turbine locations #1 and #15 to evaluate impacts to complex habitats. Based on this information, you have indicated that you will require the applicant to provide a plan that would include a proposal for the use of nature-inclusive design materials or materials appropriate for Atlantic cod habitat to mitigate for impacts to complex habitat permanently disturbed at these two sites. We appreciate that NMFS will be allowed to review and comment on the plan. We would ask you to consider extending this mitigation framework to the other turbine sites where you have concluded that micrositing is operationally or technologically infeasible, particularly for the southern row of turbine locations that overlap with particularly complex habitat areas.

In providing guidance to the applicant on this mitigation plan, NMFS recommends that BOEM require the applicant to consider all construction impacts to these habitats, not just those occurring from turbine placement, but also impacts associated with seafloor preparation, vessel anchoring, and cable installation. This is particularly important for turbines #1 and #15 where we anticipate the greatest extent of otherwise avoidable impacts, and to the locations where micrositing to reduce impacts will not be conducted. To accurately assess impacts for mitigation, pre-construction and post-construction surveys should be completed using sidescan sonar at a resolution capable of detecting and distinguishing pebble, cobble, and boulders. Once the site has been characterized both pre and post construction, mitigation to enhance and restore the impacted habitat should be required. Specifically, for the development of the mitigation plan for turbine locations #1 and #15, we request that all areas of complex habitat impacted during construction be restored using natural rounded stone, comparable pre-construction conditions, to restore physical characteristics of the impacted habitats, although we recognize BOEM's assessment that the use of certain types of natural material may not be operationally or technologically feasible. Further, we request that the mitigation plan require all scour and cable protection for these two turbines to use natural rounded stone, or if this is not feasible for engineering reasons, a minimum of a 12- to 18-inch veneer of natural stone, with comparable grain size to adjacent substrates, should be applied over all engineered protection to restore natural substrates.

Conservation Recommendations in State Waters

In your response to our EFH CRs, specifically CRs #4 and #12 and in your FWCA response, you suggest BOEM does not have jurisdiction in state waters and thus does not have the authority to require measures to minimize adverse impacts of the South Fork project in state waters. BOEM's position appears inconsistent with BOEM's policy and practice as evidenced by the most recent authorized wind project (Vineyard Wind) and past BOEM-

authorized oil and gas projects on the OCS where restrictions were imposed without geographic limits for multiple resources. Through our discussions, and as stated in your letter, you support these recommendations and have secured the Corps' commitment to adopt our recommendations in state waters. We appreciate your willingness to work with us and the Corps on providing more clarity on this issue, as it has significant implications for our consultations on offshore wind projects going forward. However, we continue to have concerns with this conclusion late in the permitting process and are concerned about the implications of this determination in our ability to efficiently and timely ensure compliance of future projects. We look forward to discussing this matter in greater detail.

Fish and Wildlife Coordination Act

In addition to our EFH conservation recommendations, we also offered recommendations under the Fish and Wildlife Coordination Act (FWCA) in our June 7, 2021 letter. In your response, you state that "the Department of the Interior has consistently determined that the FWCA does not apply to Outer Continental Shelf (OCS) leases and permits." We maintain our position that the FWCA applies to these projects and we will continue to consult and offer recommendations through the FWCA, as appropriate, to help minimize impacts of these projects on marine resources. We appreciate your consideration of our FWCA recommendations and your stated plans to coordinate with the Corps to ensure the Corps permit incorporates these recommendations.

Feasibility of Protective Measures

Throughout your response, you often refer to the "economic and technical feasibility" of requiring measures to avoid, minimize, or mitigate impacts. Although you plan to adopt, or partially adopt, CRs # 3, 4, 5, 6, 9, and 15, you offer options for the developer to not comply with that recommendation, should the recommendation not be "economically or technically feasible." We have significant concerns with this language and recommend it be removed.

Conclusion

We appreciate your further consideration of these comments, in particular as BOEM continues to adaptively develop more refined mitigation measures after the issuance of the Record of Decision. Given the importance of Cox Ledge and the resources it supports, we request your continued considerations of measures to reduce impacts of offshore wind development to this important area. Should you have any questions, please feel free to contact Alison Verkade at alison.verkade@noaa.gov. We look forward to further coordination with you on this project and future offshore wind projects.

Sincerely,



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cc:

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