



Pacific Fishery Management Council

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Chief, Environmental Assessment Section, Office of Environment
Bureau of Ocean Energy Management
760 Paseo Camarillo, Suite 102
Camarillo, California 93010

Re: Notice of Intent To Prepare a Programmatic Environmental Impact Statement for Future Floating Wind Energy Development Related to 2023 Leased Areas Offshore California. Docket No. BOEM-2023-0061.

Submitted electronically via regulations.gov

To Whom It May Concern:

Please accept these comments from the Pacific Fishery Management Council (Council) regarding the Notice of Intent (NOI) to prepare a programmatic environmental impact statement (PEIS) to analyze the potential impacts of floating offshore wind (FOSW) energy development on the five leased areas offshore Humboldt and Morro Bay, California.

The stated purpose of the Proposed Action is, in part, *to identify, analyze, and adopt, as appropriate, potential mitigation measures to be applied to the five California leases issued in 2023 in the event a Construction and Operations Plan (COP) is approved and identify minor or negligible impacts so that site-specific reviews can focus on moderate or major impacts and analyze regional cumulative impacts.* The Council supports a programmatic approach to identifying potential common impacts and mitigation measures. However, we are concerned that the stated focus on only minor or negligible impacts unnecessarily narrows the scope and the ability to adequately evaluate the range of impacts, including cumulative impacts. This letter expands on this point and includes recommended mitigation measures for inclusion in the analysis, as well as additional information for the Bureau of Ocean Energy Management's (BOEM) consideration.

Introduction/Background

The Council has fisheries management jurisdiction in federal waters for marine and anadromous species off the U.S West Coast and manages well over 100 species under its four fishery management plans. The Council is composed of state and federal government representatives, a Tribal representative, and appointed citizens.

As part of sustainably managing fisheries, the Council has enacted measures to identify and conserve essential fish habitat (EFH), protect deep-sea corals, prohibit fishing on most forage fish stocks, and protect important ecosystem functions. The Council is very concerned about climate

change and its effects on the California Current Ecosystem (CCE) and its fisheries. We very much support efforts to mitigate the effects of climate change, including the development of renewable energy projects, provided that risks to the health of marine ecosystems, ecologically and economically sustainable fisheries, and ocean habitats are adequately evaluated, and impacts are avoided. While the Council recognizes the importance of renewable energy development, we emphasize that marine fisheries off California and across the West Coast, are profoundly important to the social and economic well-being of communities in those states in addition to providing numerous benefits to the nation, including domestic food security, and addressing the needs of tribes that have federally-recognized fishing rights.

Scope, Purpose and Need of the PEIS

The Council recognizes that the scope of a cumulative impacts analysis under the National Environmental Policy Act (NEPA) typically addresses reasonable and foreseeable activities and impacts. However, that scope would not necessarily include a comprehensive, coast-wide evaluation of future OSW activities and associated impacts on a multi-decade basis. Thus, *we reiterate our recommendation for a West Coast wide programmatic analysis of cumulative effects, as described in our May 11, 2023, letter to BOEM*¹. This is further described on page 4 under Reasonably Foreseeable Activities and Impacts.

The purpose of the PEIS, as stated in the NOI, emphasizes the identification of minor or negligible impacts and timely decisions, as well as the Administration's OSW goals. The NOI emphasizes mitigation measures that could be applied if the COPs are approved, while also stating that moderate or major impacts and regional cumulative impacts would be left to site-specific analysis. This implies that the PEIS will only focus on mitigation measures for minor or negligible impacts. If done right, the PEIS could create efficiencies and ensure consistency in approaches across multiple wind projects. We are concerned that the scope of the analysis will be too narrowly focused and will not sufficiently analyze cumulative effects or establish programmatic mitigation measures.

The NOI cites the Outer Continental Shelf Lands Act (OCSLA) Congressional declaration of policy (Policy) and appropriately subjects expeditious and orderly development to "environmental safeguards." Those environmental safeguards should be the primary focus of the PEIS. We note that the Policy also directs OCSLA to "be construed in such a manner that the character of the waters above the outer Continental Shelf as high seas and the right to navigation and fishing therein shall not be affected."² Regarding the 'human environment,' NEPA requires interrelated economic and social effects to be included as part of an EIS.³ The PEIS should provide the information BOEM will use to fulfill this mandate under OCSLA consistent with the requirements of 43 U.S.C. 1337(p)(4). Those requirements include the protection of the environment, conservation of natural resources, reasonable uses of the Exclusive Economic Zone, safety, and fisheries.

¹ PMFC letter to BOEM, May 11, 2023. <https://www.pcouncil.org/documents/2023/05/may-2023-letter-to-boem-cumulative-limits.pdf/>

² 43 U.S.C. 1332(3).

³ 40 C.F.R. 1508.14.

Understanding that the PEIS and subsequent site and project specific environmental analyses allow for various approaches, the Council recommends that the PEIS focus on the following.

First, as the NOI states, the PEIS will include the No Action alternative. The PEIS should provide a framework for how COPs will be evaluated for their environmental effects individually and in combination. BOEM's approach to NEPA is founded on the idea that leases do not authorize construction and operation. Environmental effects analysis at the lease stage focuses instead on the limited activities authorized by the lease. They do not provide the public with the "look before you leap" analysis for full buildout or allow the public to compare and contrast the environmental consequences of alternative development sites.⁴ BOEM has assured the Council and the public that thorough analysis will come at the COP stage. Toward this end, the NOI states that the No Action alternative "will include context that can be used in COP-specific NEPA analyses as a baseline against which proposed actions described in a COP may be compared." We offer more specific comments on the baseline below.

Second, the PEIS should focus on all impacts, not just minor and negligible impacts, as stated above. At the Council's January 23, 2024, Marine Planning Committee online meeting, BOEM staff clarified that the PEIS will fulfill the requirements of NEPA and focus on significant impacts. This should be made clear in the next stage of BOEM's process.

Third, cumulative impacts analyses should be conducted in both programmatic and individual EISs. PEIS documents are meant, in part, to reduce repetitive analysis, and impacts may change given the scale at which they are analyzed. Therefore, cumulative impacts at the PEIS scale should act as an umbrella to those included at the COP scale not in lieu of those considered at the COP level. We find support for this view in the Council on Environmental Quality discussion on proposed changes to the NEPA regulations:

Programmatic documents can most effectively address later activities when they provide a description of planned activities that would implement the program and consider the effects of the program as specifically and comprehensively as possible.⁵

Fourth, we encourage BOEM to take a broader view of what is reasonably foreseeable for the cumulative impacts analysis. The NOI states that site- and project- specific analysis will focus on regional cumulative effects, yet the PEIS should also address cumulative impacts. We encourage BOEM to use the PEIS to consider the programmatic goals for OSW - stated mainly by BOEM (e.g., the desired five-year lease schedule) and the broader federal government as well as the State of California, but also being considered in renewable energy and transmission planning throughout the West Coast states - as reasonably foreseeable. The Council understands that impacts analyses can be more precise and thorough for more detailed and certain activities. It is reasonable to give attention proportionate to the certainty and detail available for analysis. The federal goals are to build a domestic OSW industry to lower the costs of OSW production substantially, and to address

⁴ The Council on Environmental Quality is proposing to restore the statement that the "[t]he alternatives section is the heart of the environmental impact statement" to 40 C.F.R. 1502.14, stating that it is "an integral policy statement necessary to emphasize the importance of alternatives analyses." [88 FR 49924 \(July 31, 2023\)](#). This inability to compare and contrast alternative development sites based on their environmental consequences continues to be a major source of frustration among the Council and its stakeholders.

⁵ [88 FR 49924 \(July 31, 2023\)](#).

climate change. The construction and operation of the five California lease sites would be a key part of making this goal a reality. To ignore this altogether would not serve the spirit of NEPA and its “common-sense idea of ‘look before you leap’”.⁶

Reasonably Foreseeable Activities and Impacts

With Draft Wind Energy Areas off southern Oregon, the State of California’s long term planning goal of another 20 GW of offshore wind in federal waters off the State, and the unsolicited lease requests in federal waters off the coast of Washington, a programmatic evaluation of coast-wide implications is both warranted and necessary. For example, in analyzing regional fishery impacts, the PEIS should evaluate the cumulative impacts of multiple projects, both within and outside California. Such impacts include but are not limited to changes to time and area fished, fishing gear types used, fisheries targeted, and landing ports. This is more fully described below. In addition to regional fishery impacts, consideration should be given to potential impacts to dependent fishing communities, protected species, the CCE, marine habitats, and scientific surveys which are indispensable to our understanding of the marine environment off the U.S. West Coast.

The Council has repeatedly highlighted the need to generate baseline data and datasets that will be necessary to truly measure impacts of FOSW development. We reiterate that request here, in response to the NOI. Given the significant information gaps, particularly related to FOSW technology, baseline data collection to address those gaps will be valuable in informing project specifications for individual projects. This is particularly true for impacts to fisheries, fishing communities, and marine habitats and ecosystems. ***The Council strongly recommends that BOEM ensure that sufficient baseline information is developed that can be utilized in OSW planning, including mitigation, and that data gaps are appropriately addressed before advancing new West Coast OSW leases.***

The NOI states that for purposes of analysis, BOEM is creating a hypothetical development scenario based on a representative project design envelope. BOEM should clarify whether this is meant to represent a scenario with a full build out of all five lease sites offshore California. For each lease site, a specific project design envelope could be developed which is appropriate in and for that specific area. Only then can cumulative impacts from the five lease sites be appropriately analyzed. The project areas off California span far too large and diverse an area for a single hypothetical project within a single lease area to accurately capture the potential environmental impacts of multiple offshore wind developments. Indeed, each of the five lease areas set for development is unique, and the construction of each lease will have correspondingly different impacts on the local benthic environment due to differences in sediment composition, water depth, ocean currents, resident flora and fauna, and other ecosystem characteristics. This is particularly important because the NOI implies that minor or negligible impacts will not be the subject of site-specific reviews. ***The Council strongly recommends BOEM conduct a robust region-wide cumulative effects analysis in the PEIS that includes a project envelope for each of the five leases, in advance of site-specific reviews based on a full build out scenario.*** Furthermore, considering that the CCE is a regional ecosystem extending from south of California to north of Washington, a regional cumulative impacts analysis should consider all wind energy projects in the CCE, including future projects in the Oregon Wind Energy Areas off Brookings and Coos Bay,

⁶ The quotation is from [88 FR 49924 \(July 31, 2023\)](#).

as well as the Vandenberg offshore wind demonstration project, and the additional 20 GW of offshore wind being planned elsewhere in California.

BOEM should also carefully consider California Senate Bill 286 (SB 286) which became law in 2023. SB 286 establishes the California Offshore Wind Energy Fisheries Working Group which has been tasked with “developing a statewide strategy for ensuring that offshore wind energy projects avoid and minimize impacts to ocean fisheries to the maximum extent possible, avoid, minimize, and mitigate impacts to fishing and fisheries in a manner that prioritizes fishery productivity, viability, and long-term resilience, and fairly and reasonably compensate persons engaged in the commercial and recreational fishing industries and tribal fisheries for economic impacts to ocean fisheries resulting from offshore wind energy projects.” ***The Council recommends that the avoidance, minimization, and mitigation measures developed by the SB 286 Working Group be incorporated into the PEIS, as well as all requirements of the statewide OSW strategy.***

Essential Fish Habitat and Habitat Areas of Particular Concern

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires fishery management councils to describe and identify essential fish habitat (EFH) for Council-managed fisheries based on the guidelines established by the Secretary under MSA section 305(b)(1)(A), to minimize to the extent practicable adverse effects on such habitat caused by fishing and identify other actions to encourage the conservation and enhancement of such habitat. EFH is defined in the MSA as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. §1802(10)). The MSA further authorizes the Council to comment on any federal or state activity that may affect the habitat, including EFH, of a marine or anadromous fishery resource under its authority. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Habitat Areas of Particular Concern (HAPC) are a subset of EFH that provide particularly important ecological function, are rare, sensitive, or especially vulnerable to degradation. National Marine Fisheries Service (NMFS) and the Council have designated HAPCs under the Pacific Coast Groundfish and Salmon Fishery Management Plans. Groundfish HAPCs include rocky reefs, estuaries, canopy kelp, seagrass, and several unique geological structures such as seamounts and canyons. Many of these areas are Essential Fish Habitat Conservation Areas (EFHCAs), which are closed to certain types of fishing gear to protect these habitats.

Prior Recommendations Incorporated by Reference

The Council submitted comment letters to BOEM on the [Draft Environmental Assessment \(EA\) for the Morro Bay Wind Energy Area \(WEA\) on January 11, 2022](#) and [May 16, 2022](#), the [Draft EA for the Humboldt WEA on February 10, 2022](#), and the [California Proposed Sale Notice on August 1, 2022](#). These letters included specific recommendations for data and information needs, and for analyzing potential impacts on the marine environment and fishing communities. Our previous recommendations are relevant to the PEIS and are incorporated herein by reference. We

⁷ Calif. Pub. Resources Code Sec 30616(b)

offer the following additional comments and recommendations specific to BOEM's topics of interest contained in the Federal Register Notice.

Federal Register Notice Request

The NOI *requests data, comments, information, analysis, alternatives, or suggestions relevant to the analysis of the Proposed Action*. The Council offers detailed comments below on five of the topics in the NOI.

1. Potential programmatic mitigation measures, including wind energy development alternatives offshore California, and the effects these could have on biological, physical, socioeconomic, and cultural resources.

The NOI asks for potential programmatic mitigation measures for a variety of resources, however being a nascent industry untested on the West Coast, we cannot estimate the full suite of potential impacts and related mitigation strategies. As such, the Council's recommendations are limited, drawing from OSW development elsewhere and what we suspect might be the case for waters off California. Clearly there are untold number of potential impacts for which mitigation measures are either unknown (given the uncertainty about an impact or the degree to which there will be an impact) or hypothetical in their effectiveness. The lack of scientific understanding of the potential impacts of wind energy development alternatives offshore California (or with floating OSW in general) is noteworthy. For example, we don't know if noise generated during site characterization/assessment, construction, operations and/or decommissioning will impact migratory patterns of marine mammals. If they do, and if those migratory patterns shift closer to shore (i.e., – away from the U.S. Coast Guard offshore fairways), California's Dungeness crab and other fisheries could be impacted. There is also concern that marine mammals may become disoriented due to such noise. As a mitigation measure, the PEIS should require continuous monitoring of marine mammal interactions, throughout the life of the project. Monitoring should be designed to detect marine mammal collisions and avoidance behaviors, and any marine mammal mortality event should be investigated to determine the cause of death. Depending on how the groundfish trap fishery is managed to reduce interactions with protected species, that fishery will likely be impacted as well.

Wake effects and upwelling. The Council remains concerned about the potential for OSW farms to create wind wake effects that could reduce upwelling and biological productivity within and adjacent to the lease areas. Wind-driven coastal upwelling is a primary driver of productivity in the CCE. Disruption of upwelling could also exacerbate deepwater hypoxia since upwelling (and downwelling) processes are a major driver of oxygen renewal conditions in coastal environments. Wake effects can also impact temperature, salinity, nutrient delivery, ecosystem dynamics, and stratification. Naturally occurring currents could be affected, potentially impacting biota (e.g., fish larva) with life histories that are dependent on such currents. Recent modeling efforts funded by the California Energy Commission were applied to a full build-out scenario for the Humboldt, Morro Bay, and previously proposed Diablo Canyon call areas (152, 230, and 495 turbines spaced nine turbine diameters apart). Results from this study demonstrate wind speeds at 10 m height are reduced by approximately 5 percent, with wakes extending approximately 200 km downwind of

the lease areas.⁸ Reductions in wind speed can lead to an approximately 10 to 15 percent decrease in upwelled volume transport and resulting nutrient supply to the coastal zone in the vicinity of the Morro Bay lease areas.⁹ Modeling results have also shown shifts in the spatial structure of upwelling from hypothetical buildout scenarios of turbines in the California lease areas, resulting in reduced wind stress nearshore and increased wind stress offshore. These net changes in upwelling strength can have disproportionate effects on temperature and nutrients, leading to uncertain impacts on productivity.¹⁰ Additionally, any adverse impacts could be exacerbated by climate change, especially given that climate models project decreased upwelling favorable winds in the future.¹¹ Given the complexity and uncertainty of how these processes will interact, more research and evaluation is needed to understand wind deficit effects on ecosystem processes in this region. Results from these and future studies should be used to inform the siting, design, and configuration of wind turbine arrays to minimize the impacts to upwelling, ocean stratification, and prevailing currents in the California Current. Ensure sufficient spacing between turbines to mitigate against wind wake effects and potential impacts on upwelling and other ecological functions in the CCE. ***The Council recommends the PEIS include the following mitigation measures:***

- ***A requirement that lessees (as part of their COPs) analyze wind wake effects for each design alternative and identify site designs (e.g., turbine spacing, configuration, etc.) and turbine characteristics (e.g., hub height, rotor diameter) that generate the least amount of wake effect on upwelling and other oceanographic processes.***
- ***A requirement for pre- and post-construction monitoring of atmospheric and oceanographic processes to verify modeling results and to inform the design of future wind farms. The Council urges BOEM to ensure that analyses on the impacts of offshore wind development on wake effects and upwelling be made publicly available.***

High-resolution seafloor mapping. As stated in previous Council letters, significant portions of the seafloor in the affected region have not been mapped at high resolution or sufficiently classified to identify sensitive benthic habitats (e.g., rocky substrate (including carbonate rock), methane seep bubble plume sites, biogenic/deep-sea coral and sponge habitat). High-resolution seafloor mapping and a comprehensive habitat classification map are needed throughout the five California offshore wind lease areas, including where cable corridors are likely to be located, for the purposes of assessing impacts and developing appropriate mitigation measures. ***The Council recommends that the PEIS include a mitigation measure that requires lessees to conduct high-resolution***

⁸ Raghukumar, K., Chartrand, C., Chang, G., Cheung, L., & Roberts, J. (2022). Effect of floating offshore wind turbines on atmospheric circulation in California. *Frontiers in Energy Research*, 10, 863995.

⁹ Integral Consulting, Inc. (2021). An Assessment of the Cumulative Impacts of Floating Offshore Wind Farms. Prepared for the Ocean Protection Council.

¹⁰ Raghukumar, K., Nelson, T., Jacox, M., Chartrand, C., Fiechter, J., Chang, G., ... & Roberts, J. (2023). Projected cross-shore changes in upwelling induced by offshore wind farm development along the California coast. *Communications Earth & Environment*, 4(1), 116.

¹¹ Bakun, A., Black, B. A., Bograd, S. J., Garcia-Reyes, M., Miller, A. J., Rykaczewski, R. R., & Sydeman, W. J. (2015). Anticipated effects of climate change on coastal upwelling ecosystems. *Current Climate Change Reports*, 1(2), 85-93

mapping and seafloor classification as part of their site assessment plan. Habitat data should be classified using the ecological components of the Coastal and Marine Ecological Classification Standard (CMECS). Lessees should be required to conduct their surveys consistent with the provisions of the California State Lands Commission's low-energy geophysical survey program and to conduct hydroacoustic monitoring pre- and post-construction to ensure conditions are being met.

The Council urges BOEM to ensure, through appropriate permit language if necessary, that any seafloor mapping and related data collection and classification conducted by BOEM or lessees be made publicly available to help identify habitats within lease areas that may warrant exclusion from OSW activities and to improve the identification of EFH for Council-managed species.

Exclusion and setbacks of sensitive habitats from OSW development. The Council remains concerned about the potential impacts to habitat resources in the five California offshore wind lease areas. All five lease areas overlap designated EFHCAs and HAPCs. The three Morro Bay lease areas overlap with the Big Sur Coast/Port San Luis EFHCA and include designated rocky reef HAPC. Likewise, the two Humboldt lease areas overlap with the Samoa Deepwater EFHCA and include designated HAPC (rocky reefs and rocky banks) as well as concentrations of methane seep plume sites. The two Humboldt lease areas are also within two nautical miles of the Mad River Rough Patch EFHCA, which may be relevant when establishing transmission cable routes. *The Council recommends the PEIS include the following mitigation measures:*

- *A requirement that lessees avoid siting OSW projects in or adjacent to important and sensitive benthic habitat as part of their construction and operation plans (COPs). Important and sensitive habits to avoid include, but are not limited to, hard substrate (e.g., rocky substrate, including carbonate rock), bacterial mats, submarine canyons, pockmark fields, biogenic habitats (e.g., corals and sponges), steep slope terrain, methane seep bubble plume sites, and underlying methane hydrates.*
- *A requirement to avoid anchoring and/or mooring in these sensitive benthic habitats during all phases of OSW activities.*
- *A requirement that lessees establish a minimum 500-meter buffer around these sensitive habitats to minimize impacts from OSW activities as part of their COP. Modeling and/or surveys may be necessary to determine if larger buffers are necessary to ensure adequate protection during all phases of OSW activities (i.e., site assessment/characterization, installation, operations, and decommissioning).*
- *The Council recommends the PEIS requires lessees to conduct post-construction seafloor mapping/monitoring of benthic habitat to assess potential impacts from scouring and whether the proposed setbacks from HAPCs and other sensitive benthic habitats sufficiently avoid impacts.*
- *The above recommendations apply to cable corridors to protect habitats during installation, operations and decommissioning activities associated with cable routes.*

Artificial habitats and species interactions. The underwater components of offshore wind structures will create artificial habitat that may attract large numbers of fishes and other species, potentially affecting the distribution of Council-managed species in the vicinity. This could lead to increased predation on Council-managed species and their prey. The PEIS should analyze these effects and develop appropriate mitigation measures.

Marine mammals. The NOI rightly “estimates that potential impacts may occur on certain marine life from underwater noise caused by construction and on marine mammals from collisions with project-related vessel traffic”. This should be extended to the operational and decommissioning phases as well. Potential mitigation measures include:

- California’s commercial and recreational Dungeness crab fisheries are managed to minimize the risk of interactions with humpback whales, blue whales, and leatherback sea turtles. Under California’s Risk Assessment Mitigation Program (RAMP), management will be required if the number of humpback whales, blue whales and/or leatherback sea turtles near or within the fishing grounds exceeds a threshold number. To reduce opportunities for takes of these animals, BOEM should not allow any construction, operations, or decommissioning activities to take place when humpback whales, blue whales, or leatherback sea turtles are present. California’s RAMP regulatory framework would be an appropriate model.¹² In addition to those three species, additional analysis and protections should be included for any species for which critical habitat is included in the lease sites or in the areas between the coast and the lease sites. The coast, as contemplated here, could be further refined to include only those ports/harbors that will house vessels/equipment utilized in the pre-construction and construction phases.
- Developers on the East Coast are deploying bubble-curtains during construction activities in an effort to absorb “80 to 90 percent of the deafening acoustic energy generated during the turbine installation process”.¹³ We acknowledge that installation activities off the West Coast will differ from those on the East Coast; but support efforts to minimize potential impacts to marine life from noise associated with offshore wind activities. For sake of clarity, this would be in addition to the first bullet, not in lieu of.

Marine debris. The Council is concerned about the potential impacts to marine habitats and species from marine debris produced by activities during all phases of offshore wind development (i.e., site assessment/characterization, installation, operations, and decommissioning). ***The Council recommends the PEIS include a Marine Debris Monitoring & Management Program that will require lessees to avoid, minimize, and offset impacts to the environment caused by marine debris from offshore wind activities.*** The Program should require that all equipment be marked with the lessee’s contact information. If repeated discoveries of material/equipment are found by lessee’s or the public, those lessees should evaluate and implement alternative equipment or practices that would reduce these consistent sources of debris. ***The Council also recommends the***

¹² RAMP is the management process by which the Ca DFW manages the Dungeness crab fishery. See - [RAMP OAL approval and Final 132.8 Regulations \(ca.gov\)](#)

¹³ See [US firm pilots 'bubble curtains' for offshore wind turbine construction \(msn.com\)](#)

PEIS include a programmatic mitigation measure that requires lessees to promptly recover all equipment during all stages of the project (i.e., site assessment/characterization, installation, operations, and decommissioning).

Vessel traffic. Vessels servicing the offshore wind industry will make significant numbers of trips. For example, the Draft EIS for Empire Wind (New York) assumes “an average of 2.8 vessel trips per day between ports and the Lease Area during construction, and 1.4 vessel trips per day during operations.” This vessel traffic will negatively impact air quality. The California Air Resources Board recently amended its Commercial Harbor Craft regulations.¹⁴ To mitigate impacts to air quality, ALL vessels utilized in any offshore wind related activity should be compliant with those regulations.

Accidental discharge of pollutants. Offshore wind turbines, substations, drilling equipment, and the vessels servicing them house significant amounts of coolants, fuel, lubricating oils, and other petroleum compounds that, if released, pose significant risks to water quality and the marine environment.¹⁵ The risk of accidental release needs to be analyzed and mitigated. At a minimum, each turbine, substation, and vessels should be equipped with sensors that immediately indicate when a release has occurred. Automatic and/or remote shut-offs should be required, with redundancies. Sufficient boom materials and clean-up supplies must be readily available on the turbines or in nearby ports, with contracts in place with contractors for clean-up efforts. Any formal spill response plan should ensure the lessee immediately notify local and regional fishermen and fishing associations to advise them of any such release so those areas can be avoided should the contamination leads to a temporary fishery closure due to a threat to public health.¹⁶

Tribal Fisheries: There is concern among those West Coast Indian Tribes that have management authorities and responsibilities, that upwelling, larval transport, habitat suitability, or other functions dependent upon oceanographic conditions offshore California will be negatively affected by windfarms. Changes in or diminished oceanographic conditions could negatively impact migratory stocks including sablefish, whiting, sardine, and other fisheries important to Tribes with federally-recognized fishing rights to harvest those species in other West Coast states. It is incumbent on BOEM to assess any potential impacts to treaty and trust resources as part of their trust responsibility to the affected tribes. Negative impacts from OSW development and operations would result in significant cultural and economic losses outside of the State of California. ***The Council recommends that the PEIS analyze potential impacts to tribal interests, including treaty and trust resources, both within and outside the State of California. In addition to the recommendations under wake effects and upwelling (above), the PEIS should analyze potential impacts to tribal interests both within and outside the State of California, using the Before-After Control-Impact approach.***

¹⁴ See - [Final Regulation Order \(ca.gov\)](#)

¹⁵ The Empire Wind DEIS states each turbine will house 2,378 gallons of transformer oil, 95 gals of main bearing grease, 32 gals of Yaw oil, 95 gals of Yaw gear oil, 95 gals of main bearing grease, 317 gals of hydraulic oil, 872 gals of cooling (water/glycerol), 53 gals of pitch lubrication (grease), 17,171 gals of Pitch system hydraulic accumulators (nitrogen), 18 gals of Pitch gearbox oil, 1,057 gals of Gearbox oil, 287 pounds of Sulfur hexafluoride. Each substation will house 158,803 gals of Transformer/reactor oil, 11,023 pounds of Sulfur hexafluoride, 7,925 gals of diesel fuel and 66,139 pounds of UPS batteries. See Table E-3 of Empire DEIS.

¹⁶ In October of 2021, a fishery closure went into effect after an oil spill. See - [March 6, 2006 \(amazonaws.com\)](#)

Commercial fisheries and recreational fishing. When considering impacts to commercial fisheries and recreational fisheries, BOEM must differentiate and appreciate the nuances of each individual fishery and gear type. A blanket approach that lumps together all fisheries will fail to adequately identify impacts and not tailor mitigation measures to be effective. To the extent most commercial fisheries will be functionally barred from operating within the lease sites, there will be significant negative impacts. Depending on the layout of the project, there is a possibility that surface fisheries may be able to operate within the lease sites; assuming those vessels will not otherwise be restricted by law or other purposes. Absent any other restrictions, requiring interarray cables to be buried under the sea floor would allow non-surface fisheries to operate within a lease site. If all fisheries are restricted, or unable to access lease sites due to insurance exclusions, this would affect commercial and recreational fisheries for highly migratory species and groundfish.

Scientific surveys. The Council remains concerned about potential disruptions to important scientific surveys that provide data vital to fisheries management and ecosystem protection actions. The National Oceanic and Atmospheric Administration (NOAA) Fisheries West Coast Region, through the Northwest and Southwest Fisheries Science Centers and in collaboration with the Canadian government, conducts regular coast-wide fishery surveys in areas which overlap with the current lease areas. ***The Council recommends that BOEM ensure turbine and substation locations, interarray cable layout, and cable routes to shore be designed to ensure these NOAA surveys and other surveys critical to informing fisheries management are not impacted by wind energy development.*** This may mean working with survey Principals to identify and design OSW development that will avoid impacts to scientific surveys. The Council supports the efforts of BOEM and NOAA to develop a survey mitigation strategy and encourages development of a Pacific Coast focused strategy in the PEIS. If the bases of the floating turbines act as fish aggregating devices (FADs), particularly for coastal pelagic species such as sardine, anchovy, or mackerel, those fish/larvae/etc. will be unavailable for collection by the survey vessel(s). BOEM should consult with NMFS to determine appropriate mitigation for any negative impacts to the surveys and datasets.

Cumulative fishery impacts. Item two in the NOI requests information on other current or planned activities in, or in the vicinity of, the five California wind energy lease. ***The Council recommends the PEIS analyze cumulative impacts to fisheries and fishing communities from the reasonably foreseeable future offshore wind developments in the Draft Wind Energy Areas off Oregon and another 20 GW off the California coast to meet the State's long term planning goals***¹⁷. To the extent vessels and fisheries are displaced from the lease sites, they will be forced to relocate to other areas. Therefore, it is important to evaluate how all existing and potential future wind projects could affect overall fishing operations due to effort displacement, shifts from one fishery to another, changes to gear usage and frequency, changes to fishery distribution and abundance, changes in bycatch avoidance, and increase fishing effort (and/or reductions in catch per unit of effort) due to being forced to fish in less productive areas or areas with higher bycatch.

Gear loss. In the event of interactions between fishing gear and any part of an offshore wind development, **the Council recommends a streamlined process to file a gear loss or damage**

¹⁷ [California sets the largest offshore wind goal of any state in the US \(electrek.co\)](http://electrek.co)

claim by an impacted fisherman is necessary. In addition to compensation for damage or loss of the gear, the value of any catch likely to be in the gear should be compensable.

Electromagnetic fields. The PEIS should discuss the impacts of electromagnetic fields (EMF) from offshore wind energy activities on finfish, invertebrates, marine mammals, sea turtles, and EFH. Increased numbers of subsea cables from future offshore wind energy projects and other marine industries may lead to cumulative effects in heavily developed regions. The potential for cumulative effects from EMFs has not been characterized in studies or research to date. This is why it is particularly important to consider the EMF from a single cable in the context of other cables in the area (existing, proposed, planned, and likely), as well as other EMF-generating activities that might occur in the region. For example, the addition of turbines or transmission paths may increase the number of subsea cables that a migratory species will encounter along its migratory route. These scenarios need to be studied in the PEIS in order to understand the potential interactions and impacts that could occur.

Demographics. Many of California's fishing communities may be low-income or otherwise disadvantaged communities. Many jobs in the seafood sector utilize the services of marginalized communities, including people of color. The PEIS should consider the demographics of the impacted fishing communities, including those in southern Oregon that also travel to California to fish in the lease areas. BOEM should consider utilizing the NOAA Fisheries Community Social Vulnerability Indicators Toolbox to better evaluate potential impacts to coastal communities.

Employment and Economics. The NOI lists job creation as a beneficial impact; but it fails to mention job loss as a negative impact. Certainly, the offshore wind industry will provide temporary and permanent employment. BOEM must also consider job loss in the seafood industry. Each year, NOAA publishes a Report entitled *Fisheries Economics of the United States*. The most recent version provides information on the employment and economic impacts of the California Seafood Industry.¹⁸ In 2021, California's seafood industry supported 149,034 jobs, with \$31.215 billion in sales, generating \$6.640 billion in profits. For that same year, the economic impacts of recreational fishing expenditures accounted for 7,265 jobs, with \$1.039 billion in sales, generating \$275.982 million in profits. In total, California's fishing industry provides well over 150,000 jobs. The fishing industry is an important economic driver for California, and the life blood of many communities up and down the entire West Coast. Small family-owned commercial fishing and commercial passenger fishing vessel businesses will be challenged to weather this storm – and some will not. Some may have to relocate their operations elsewhere in California, assuming they can or, more likely, out of state. ***The Council recommends the PEIS analyze potential impacts to seafood industry jobs and economics that include a scenario where a main buyer in Eureka or Morro Bay must close its doors due to a lack of product available to the facility.*** It is necessary to analyze impacts to the local commercial harvesters if their market was to suddenly go out of business and if recreational businesses lose access to related port businesses. ***The Council recommends the PEIS also analyze potential negative impacts to employment for businesses that are dependent upon the commercial and recreational fishing industries.*** For example, fuel docks, engine and refrigeration repair businesses, shipyards, fishing gear manufacturers, bait shops, and seafood restaurants are among the businesses that could be impacted.

¹⁸ See - <https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-economics-united-states>

Environmental Justice. For many Californians, the only access they have to the living marine resources off the coast is through the products the seafood industry harvests, processes, and sells for their benefit. California’s commercial and recreational fishing communities stand to be the most negatively impacted by developments on the lease sites. In terms of offshore wind development, those communities have not enjoyed meaningful engagement nor have their inputs helped to create better-informed decisions. BOEM established the New York and New Jersey Offshore Wind Environmental Justice Forum as part of its efforts in developing a PEIS for the six lease sites in the New York Bight. The Council supports establishing a similar Forum for communities in California and Southern Oregon who stand to be the most impacted, with the proviso that suggestions in those forums be sufficiently addressed.

Land use and coastal infrastructure. California’s ports and harbors will require major modifications to serve the offshore wind industry. The Humboldt Bay Harbor, Recreation and Conservation District and the Port of Long Beach appear to be the primary hubs for assembly and deployment of the floating turbines. Dockage and land space in ports and harbors are limited. Fishing is a water dependent use and sufficient land space on or adjacent to the waterfront is necessary to support operations. There is a very real concern that limited port/harbor space will be repurposed for OSW support to the detriment of California’s recreational and commercial fishing communities. A potential mitigation measure would include assurances that sufficient space, dockage, and adjacent land will remain available to service those communities, including the needs of transient vessels participating in seasonal fisheries.

Navigation and vessel traffic. The NOI acknowledges the potential for conflict for “land-based radar services”; but fails to mention impacts to vessel-based radar operations. The National Academy of Sciences (NAS) issued a report in 2022 acknowledging that offshore wind farms can interfere with navigational radar used by ships and smaller vessels to avoid collisions, posing challenges for safe maritime navigation¹⁹. Safety at sea is of paramount importance to the Council. The NAS report recommended that BOEM and other relevant agencies pursue practicable options to mitigate the interference of wind farms. Mariners on vessels whose radars are rendered inoperable due to interference should be provided operational radars (including installation fees), at no cost. ***The Council recommends potential for conflict with vessel-based radar operations be analyzed in the PEIS.***

Scenic and visual resources. ***The Council recommends the PEIS include visual simulations from the perspective of a mariner.*** These simulations would not only depict navigating close to an OSW facility; but also a visual depiction of what the facility would look like from the water, from 5, 10, 20, and 30 miles away, in various weather conditions and daylight/night conditions, and from various elevations.

2. Information on other current or planned activities in, or in the vicinity of, the five California wind energy lease areas under analysis.

The NOI states that regional cumulative impacts will be analyzed during site-specific reviews. As mentioned above, ***the Council recommends BOEM include a region-wide cumulative impact analysis in the PEIS that evaluates impacts to the marine environment from all wind energy***

¹⁹ <https://www.nationalacademies.org/our-work/wind-turbine-generator-impacts-to-marine-vessel-radar>

projects in the CCE. This would include projects in the California lease areas and future wind energy projects in the Oregon Wind Energy Areas off Brookings and Coos Bay, as well as the Vandenberg offshore wind demonstration project, and the additional 20 GW of offshore wind being planned elsewhere in California.

The Council recommends the PEIS consider all of the following reasonably foreseeable activities in its cumulative impact analysis:

- Two Draft Wind Energy Areas off Oregon (Coos Bay and Brookings);
- The Port of Long Beach and the Humboldt Bay Harbor, Recreation and Conservation District have both recently released their respective Notice of Preparation to prepare a Draft Environmental Impact Report for port development to support offshore wind development activities. Channel dredging and deepening can dramatically alter estuarine hydrology, salinity intrusion, and ecosystems. Estuaries, seagrasses, and other submerged aquatic vegetation are HAPCs which will be affected by such activities. Additionally, channel deepening can impact estuarine tidal wetlands (marshes and sloughs) which are critical for salmonid life history and diversity.²⁰ ***The Council recommends the PEIS include analyses and mitigation measures to avoid, minimize, mitigate, or otherwise offset impacts to harbors, ports, and bays associated with offshore wind activities.*** For example, the PEIS should analyze potential impacts from channel deepening and maintenance activities, as it relates to bringing turbines or other infrastructure to ports for repair, including impacts to water quality and potential spread of invasive species;
- An additional 20 GW of FOSW planned for federal waters off the California Coast. The AB 525 Draft Strategic Plan²¹ includes a chapter identifying suitable sea space. It is reasonable to assume that additional Call Areas off California will be identified before January 1, 2026;
- The potential designation of a national marine sanctuary²² immediately adjacent to the three Morro Bay lease sites;
- Wave energy powered desalination pilot off Fort Bragg;²³
- A proposed demonstration project for offshore wind off Point Arguello, California.²⁴ This is in the vicinity of the three Morro Bay lease sites;
- All foreseeable offshore aquaculture and mariculture projects, including NOAA's Aquaculture Opportunity Areas in the Southern California Bight. This will be important if the Port of Long Beach will be utilized by the offshore wind industry for assembly, deployment, and maintenance. Increased traffic in the shipping lanes between Long Beach

²⁰ Greene, C.M., E. Beamer, J. Chamberlin, G. Hood, M. Davis, K. Larsen, J. Anderson, R. Henderson, J. Hall, M. Pouley, T. Zackey, S. Hodgson, C. Ellings, and I. Woo. (2021). Landscape, density-dependent, and bioenergetic influences upon Chinook salmon in tidal delta habitats: Comparison of four Puget Sound estuaries. ESRP Report 13-1508.

²¹ See - [AB 525 Reports: Offshore Renewable Energy \(ca.gov\)](https://www.ca.gov/ab525-reports-offshore-renewable-energy)

²² <https://sanctuaries.noaa.gov/chumash-heritage/>

²³ <https://mendovoice.com/2022/12/fort-bragg-considering-wave-energy-powered-desalination-in-latest-novel-water-move/>

²⁴ <https://www.slc.ca.gov/renewable-energy/offshore-wind-applications/>

and Point Conception needs to be considered as they lay between the mainland and northern Channel Islands;

- California's and the federal government's 30 x 30 initiatives which may result in additional fishing restrictions and/or fleet displacement; and
- Oil and gas decommissioning activities off southern California.

3. Possible alternatives and the alternatives' potential impacts on planned activities.

The Council recommends the PEIS include two Alternatives: 1) a “demonstration wind farm” Alternative to better evaluate impacts and mitigation measures, prior to full build out of OSW leases, and 2) a “minimum footprint” Alternative based on the minimum footprint (i.e., minimum number of turbines) necessary to achieve the state’s goal of 25 GW by 2045.

4. Other impacts on the human environment from California wind energy development in the five lease areas, including any mitigation measures.

Safe passage. *The Council recommends turbine layouts be designed to ensure safe passage to and from ports adjacent to the five lease areas -- Morro Bay, Avila, Humboldt, Crescent City -- and transit between Point Conception and Point Sur in prevailing weather conditions.*

Port/Harbor access. Minimize port/harbor closures during deployment and/or turbine retrieval for maintenance. Reported weeks-long closures of commercially and recreationally important ports/harbors will do untold harm to those fishing communities, even if those harbors are not directly adjacent to the two California lease areas.

5. Information on the following for the development of the representative project design envelope and activities scenario: layout of turbines (analyze one or more standard layouts); setbacks identified in the leases; size (wind turbine generator nameplate capacity), dimensions (tip height, hub height, and rotor diameter) and number of turbines; offshore substation type, dimensions, number, and location; type of foundation or mooring design; foundation or mooring installation method; scour protection; approach to cable emplacement (installation methods and disturbance corridor width); location of landfalls; onshore substation location; point of grid interconnection; ports, fabrication facilities, and staging areas; timing of onshore and offshore activities; and associated activities such as vessel trips.

Turbine layout. The waters in and around the lease sites are often subject to hazardous weather conditions. During inclement weather, it is imperative that mariners can safely transit to the nearest harbor in prevailing weather conditions. Turbine layout should be such that safe passage through a windfarm is not compromised taking into account prevailing weather conditions. This could be done by ensuring appropriate transit lanes are included within a lease to assure safe passage to and from local ports. As mentioned above, *the Council recommends the PEIS assess how modifications to wind turbine layout, spacing, size, dimension, and number of turbines impact wind wake effects in the project area.* The alternatives analysis should identify site designs that generate the least amount of wake effect on upwelling and other oceanographic processes.

Setbacks (buffers) from sensitive habitats. As mentioned above, ***the Council recommends the PEIS include a mitigation measure that requires lessees to establish a minimum 500-meter buffer around sensitive habitats to minimize impacts from OSW activities.*** Cable corridors should also incorporate appropriate setbacks from sensitive habitats. Modeling and/or surveys may be necessary to determine appropriately sized buffers to ensure adequate protection during all phases of OSW activities.

Cable routes. ***The Council recommends that cable routes to shore avoid sensitive habitats and areas important to commercial and recreational fisheries.*** These routes will necessarily have to cross grounds and habitats important to fisheries that do not operate within the lease sites. Cable routes have the potential to impact ALL federal and state-managed fisheries. Cable landfalls should be as close to the lease sites as is possible. Landing power in Los Angeles (from Morro Bay) or San Francisco/Moss Landing (from Humboldt) should not be considered. Additionally, the Council recommends avoiding cable landings near river mouths in relation to steelhead and salmon feeding and migration, as EMF may interfere with salmonid migration and feeding.

Cable installation. ***The Council recommends that cables be buried to the deepest extent practicable to reduce operational conflicts with bottom fishing and that cable routes and landing areas be sited to avoid sensitive habitats.*** It is critical that planning for installation be thoughtfully designed to avoid the need for re-burial and the ongoing disturbance to fishing, species, and habitat. For example, because of shifting sediments at the Block Island (Rhode Island) OSW facility, cables buried shallower than state agency recommended 8 – 10 feet were exposed within months and had to be reburied deeper than the 4 – 6-foot depth to which the cables were originally buried (EcoRI News 2020). Horizontal directional drilling was eventually employed to bury the cables to a depth of 25 – 50 feet (Block Island Times, 2020). To avoid such ongoing disturbance ***the Council recommends the PEIS include a thorough analysis of cable and transformer placement strategies based on seafloor conditions.*** Additionally, the analysis should include impacts associated with climate-driven increases in wave height and sea level rise, and the potential scouring that these more energetic conditions create where the cables come onshore. ***The Council also recommends lessees coordinate on shared transmission corridors to minimize the number of cable corridors.*** We understand that BOEM’s conservative working estimate of the number of cables needed, is up to 10 cables per GW, based on OSW development off the U.S. East Coast. Applying this calculation to the 4.5 GW of power planned for the Morro Bay and Humboldt WEAs would amount to 45 cables, which suggests that avoiding sensitive habitats could be difficult. Additionally, substantially more cables are expected to be installed to support the state’s goals of 25 GW by 2045. ***The Council recommends the PEIS include a realistic estimate of the number of cables and cable routes needed for these lease areas and include maps of potential cable routes and landing sites that prioritize the avoidance of sensitive habitats as a mitigation measure for lessees to include in their COP.***

Turbine dimensions. Turbine size and height should be appropriate given weather conditions during the winter. They should be able to withstand 75+ knots of wind and 40+ foot seas. ***The Council recommends weak links on the interarray cable should be required to avoid a catastrophic disaster where multiple turbines are impacted in the event one turbine breaks free from its mooring or is knocked over by the wind and waves.***

Offshore substations. ***The Council recommends offshore substations be located within the lease area.*** In the event a developer is considering an offshore converter station, sufficient protections should be required to ensure no negative impacts to the marine environment or marine life are considered.

Ports. Ports utilized for offshore wind support should not be those with already limited dock and land space. As noted above, it is expected that construction/assembly/deployment and land-based maintenance will be based in Humboldt and Long Beach. It is also expected that activities associated with on-the-water maintenance and servicing will be based in ports and/or harbors closer to the lease sites. ***The Council recommends the PEIS encourages lessees in California to commit to using ports that adopt a “green terminal strategy” that is equipped with shore power and zero-emissions material-handling equipment, and construction firms that offer alternative-fueled or zero-emissions equipment and vehicles.***

Scheduling of offshore activities. Offshore activities should be scheduled to minimally disrupt fishing activity (transit, active fishing, offloading, etc.) fishing seasons. Deployment of assembled turbines should be scheduled to take place when fishing activity is likely to be minimized. For example, in the Humboldt area deployment should not be scheduled during the first two months of the Dungeness crab season.

Thank you for considering these comments and recommendations regarding OSW energy development off California and the West Coast. The Council considers protection of vital marine resources and fishing-dependent communities of paramount importance, as OSW planning and development move ahead on the West Coast. Please contact Kerry Griffin on Council staff (Kerry.griffin@noaa.gov) with any questions or concerns.

Sincerely,



Brad Pettinger
Council Chair

KFG:acl

Cc: Council Members
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