Pacific Fishery Management Council

7700 NE Ambassador Place, Suite 101 Portland, OR 97220-1384
Phone 503-820-2280 | Toll free 866-806-7204 | Fax 503-820-2299 | www.pcouncil.org
Brad Pettinger, Chair | Merrick J. Burden, Executive Director

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Environmental Analysis Section Supervisor
Office of Environment, Pacific Regional Office
Bureau of Ocean Energy Management
760 Paseo Camarillo, Ste. 102
Camarillo, California 93010

Re: **Notice of Availability of the California Offshore Wind Draft Programmatic Environmental Impact Statement (Docket No. BOEM–2023–0061)**

To Whom it May Concern;

The Pacific Fishery Management Council (Council) appreciates the opportunity to offer the following comments on the Notice of Availability of the California Offshore Wind Draft Programmatic Environmental Impact Statement (DPEIS) published by the Bureau of Ocean Energy Management (BOEM). The DPEIS assesses potential biological, socioeconomic, physical, and cultural impacts that could result from floating offshore wind energy development associated with the five lease sites off the California coast. The stated purpose of the Proposed Action is to identify and analyze potential mitigation measures that BOEM can, but may not necessarily, require as conditions of approval for future Construction and Operation Plans (COPs) or that lessees can choose to incorporate directly into their COPs. The need for Proposed Action is to ensure BOEM can make timely decisions on COPs submitted by lessees for the Humboldt and Morro Bay leased areas. The DPEIS also addresses the following additional objectives: (1) Analyzing potential impacts if development is authorized in the five leased areas; (2) Analyzing programmatic mitigation measures to apply to development of the five leased areas; (3) Analyzing regional cumulative effects; and (4) Providing a tiering document for project-specific environmental analyses.

The DPEIS analyzes three Alternatives:

- Alternative A - the No Action Alternative
- Alternative B - Development with no Mitigation Measures. Two scenarios are considered under the Alternative:
  - One representative project each in Humboldt and Morro Bay, and
  - Five representative projects (two in Humboldt and three in Morro Bay, corresponding to the distribution of leased areas).
- Alternative C, the Proposed Action - Adoption of Mitigation Measures. This assumes development in the lease areas (as in Alternative B) but with the adoption of programmatic mitigation measures intended to avoid/reduce such impacts.

The Council supports responsible development of offshore wind (OSW) energy which: (i) avoids, minimizes, offsets, and monitors for adverse impacts on wildlife and habitats, (ii) avoids, minimizes and offsets negative impacts on other ocean uses and the communities dependent on those uses, (iii) includes meaningful consultation with Native American tribes and communities, (iv) meaningfully engages state and local governments and stakeholders from the outset, (v) includes comprehensive efforts to avoid impacts to underserved communities, and (vi) uses the best available scientific and technological data to ensure science-based, stakeholder-informed decision making.

Scope and Scale of Analysis

The Council anticipated the DPEIS would consider a wider range of alternatives that would analyze the full range of foreseeable actions with sufficient detail and resolution, as presented in the Representative Project Design Envelope (RPDE), and would include prescriptive mitigation measures. Absent a more robust PEIS, the Council remains concerned that impacts on the marine environment and fisheries are insufficiently characterized, quantified and mitigated.

As noted in our previous comments to BOEM, the Council is particularly concerned about the scale of OSW development and the potential magnitude of impacts on sensitive benthic habitats in lease areas and cable easements. **The Council recommends a stepwise approach to development where offshore wind can be piloted on a smaller scale to allow a better understanding of the impacts before full scale implementation**. This should include developing monitoring protocols, data management plans, and thresholds for impacts. Projects should be sized appropriately to ensure OSW development is implemented in a manner that avoids and/or minimizes impacts to California's natural resources.

Considering the near-term and long-term scale of OSW development anticipated for the West Coast, and the scope and scale of potential cumulative impacts on the marine environment and dependent fishing communities, a big picture perspective is not only appropriate but required by the National Environmental Protection Act (NEPA). Limiting the scope of the DPEIS to only the five California lease sites fails to consider Federal and State energy planning goals that expand the OSW energy footprint on the West Coast. Furthermore, Appendix C (Planned Activities Scenario) implies that actions not yet taken (i.e., identification of additional Call Areas off California and further action on unsolicited lease requests off Washington) are beyond the scope of this PEIS. This disregards Federal and State planning efforts and is inconsistent with the NEPA definition of "reasonably foreseeable action"[1]. The full scope and scale of OSW development necessary to fulfill Federal and state energy goals on the West Coast should be analyzed in this DPEIS.

Scale of Potential Development Scenarios

While floating OSW continues to evolve, NREL's report on the Representative Project Design Envelope for Floating Offshore Wind Energy: A Focus on the California 2023 Federal Leases provides the first glimpse at a practical range of technology options that may be deployed, accounting for major physical constraints and technical readiness. This RPDE provides estimates

[1] 43 CFR 46.30 "Reasonably **foreseeable** future **actions** include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur,"

of the scale and number of components in a floating offshore wind facility when there is a need to describe impacts. Therefore, it will be important to understand the cumulative impacts for the scale of potential development scenarios included in the RPDE. **The Council recommends that any cumulative impacts analysis of alternatives include sub-alternatives that analyze both the minimum and maximum values for the design element ranges when evaluating impact scenarios (see table 1 in the RPDE) as follows:**

- Alternative A: No action (no development)
- Alternative B (development needed to meet state goals)
  - Sub-alternative B.1: Minimum range of design element impacts
  - Sub-alternative B.2: Maximum range of design element impacts
- Alternative C (development needed to meet state goals with mitigation measures)
  - Sub-alternative C.1: Minimum range of design element impacts
  - Sub-alternative C.2: Maximum range of design element impacts

The Council recommends that BOEM analyze Alternative C with sub-alternatives C.1 and C.2 as noted above. The Council recommends BOEM select Alternative C sub-alternatives as the Preferred Alternative in the final PEIS, provided that additional modifications to the PEIS include: (1) a preliminary quantitative impact analysis for marine, coastal and estuarine resources, (2) prescriptive mitigation measures for marine, coastal and estuarine resources; (3) more thorough description of the full scope and magnitude of potential impacts/effect on west coast commercial, for-hire, recreational and tribal fisheries and fishery-dependent communities; and (4) detailed discussion of data and research gaps and identify a plan to fill those gaps prior to COP review. These and other recommendations are discussed below.

Fisheries Management Authorities

The Council has fisheries management jurisdiction in federal waters off the U.S West Coast and manages roughly 119 species of salmon, groundfish, coastal pelagic species and highly migratory species under its four fishery management plans (FMPs). This includes responsibilities for protecting the marine ecosystem, habitats, and the wellbeing of coastal communities. The Council is comprised of representatives from state and federal agencies, Native American tribes, fisheries, conservation organizations and other appointed citizens. Council authorities and actions are guided primarily by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as well as the Endangered Species Act, Marine Mammal Protection Act, and the 10 MSA National Standards. In addition to the four FMPs, the Council's non-regulatory Fishery Ecosystem Plan includes a vision statement that captures these responsibilities: *The Council envisions a thriving and resilient California Current Ecosystem that continues to provide benefits to current and future generations and supports livelihoods, fishing opportunities, and cultural practices that contribute to the wellbeing of fishing communities and the nation.*[2]

Essential Fish Habitat (EFH) and Council Authorities

The MSA requires the Council to describe, identify, conserve, and enhance essential fish habitat (EFH) for species managed under the Council's fishery management plans (FMPs) and includes provisions to designate habitat areas of particular concern (HAPC). The Council has identified and

[2] Pacific Coast Fishery Ecosystem Plan, For the US Portion of the California Current Large Marine Ecosystem (March 2022) - page 1

described EFH throughout the Pacific Coast region for species in its four FMPs (Pacific Coast groundfish, Pacific Coast salmon, coastal pelagic species (CPS), and highly migratory species (HMS)), and has designated HAPCs for groundfish (rocky reefs, estuaries, canopy kelp, seagrasses, offshore banks, seamounts, canyons, and other areas of interest) and salmon (estuaries, marine and estuarine submerged aquatic vegetation, spawning habitat, thermal refugia, and complex channels and floodplain habitats). In addition, the Council has designated EFH Conservation Areas (EFHCAs) for groundfish, which are spatially discrete areas to protect sensitive benthic habitats from the effects of some types of bottom fishing. Under the MSA the Council may comment on Federal and state actions that may affect the habitat, including EFH, of a fishery resource under its authority, and is required to do so if the activity is likely to substantially affect that habitat. 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. Federal action agencies must provide detailed responses to conservation recommendations provided by the National Marine Fisheries Service (NMFS), and the Council requests the same detailed response to Council conservation recommendations.

Many of the Council's previous comment letters on OSW energy development provide greater detail regarding best practices to minimize impacts to habitat and ecosystem, commercial and recreational fishing activities, and coastal communities. These letters are incorporated by reference.

The Outer Continental Shelf Lands Act[3] includes a provision that requires the Secretary of Interior "to ensure that any activity under this subsection is carried out in a manner that provides for:

- *Safety*. The DPEIS suggests that loss of life may occur due to allisions or collisions and none of the mitigation measures included address this.

- *Conservation of the natural resources of the outer Continental Shelf*. The DPEIS acknowledges "Degradation of EFH and HAPCs could be long term to permanent as anchor scars have shown to be persistent. The footprint of each anchor would be relatively small, although any benthic habitat under each anchor would be permanently lost."

- *Prevention of interference with reasonable uses*. The DPEIS clearly states that floating OSW facilities – wind turbine generators, substations, and interarray cables suspended in the water column – will clearly interfere with fishing activities; and for some gear types, act as closed areas.

General Comments on the DPEIS

Throughout the DPEIS and Appendices numerous significant research gaps are noted but these are not discussed with sufficient detail for the public and lessees to understand these gaps, make informed decisions, or offer informed comments. The DPEIS should present all available relevant research findings and data, acknowledge research and data gaps, and evaluate impacts using

[3] 43 U.S.C. §1337(p)(4)

accepted scientific methods, while refraining from making broad assertions without sufficient supporting information.

During the December 6, 2024 meeting of the Council's Marine Planning Committee (MPC), members explained to BOEM that the discussion of impacts under the No Action Alternative was more developed than the discussion of impacts under Alternatives B and C, and that this seemed to misrepresent the magnitude and scope of potential impacts from OSW development. The **Council recommends that the DPEIS take a more balanced approach in the characterization of impacts from OSW in Alternatives B and C**.

The approach taken by BOEM in considering the cumulative impacts of developments on the five leases seems to not account for the synergistic effect of multiple projects. Comparing one project in each lease site to full build out within both Wind Energy Areas (WEAs) will result in greater impacts than just doubling the impact of one development in the Humboldt WEA or tripling the impact of one development in the Morro Bay WEA. As BOEM works to finalize the PEIS, it needs to consider that cumulative impacts are non-linear and will likely grow at a higher rate as more lease sites are developed.

Specific Comments – Volume I:

Chapter 2 - Proposed Action and Alternatives

In August of last year, the MPC received presentations from the Pacific Northwest National Laboratory (PNNL) and Department of Energy (DOE) on West Coast Offshore Wind Transmission Planning. Many of the things being considered by PNNL and DOE related to transmission planning could have been included in the DPEIS. Particularly where transmission is mentioned in Chapter 2.

Section 2.1 – Alternatives Analyzed in Detail

The DPEIS considers two scenarios under Alternatives B and C: (1) one representative project in a Humboldt leased area and one in a Morro Bay leased area, and (2) a total of five representative projects (two in Humboldt and three in Morro Bay). The DPEIS includes the RPDE as the basis for the analysis and is described as a reasonable representation of the level of offshore wind development that could feasibly occur in any of the five Humboldt and Morro Bay leased areas. The RPDE provides the technical specifications and spatial configurations of design scenarios across a range of scales. Although design scenarios are illustrative and not prescriptive, they indicate the type and magnitude of many potential impacts associated with wind farms and transmission infrastructure off California. However, the two scenarios described under Alternatives B and C do not provide sufficient detail on what is being considered a "representative project". For example, the number of turbines in a representative plant layout in the RPDE ranges from 30-200 turbines per lease area. For the scenario of five representative projects, this could range from a total of 150 to 1,000 turbines. Nor do the two scenarios include even a cursory quantitative impact analysis using the technical specifications and spatial parameters presented in the RPDE. Providing a meaningful impact analysis in the PEIS will help guide site-specific NEPA analyses. For example, Scenario 1 should analyze impacts from a Morro Bay and Humboldt lease area that have the minimum number of turbines (30 per lease area, 60 turbines total) and maximum

number of turbines (200 per lease area, 400 turbines total), and Scenario 2 should analyze impacts from the minimum number of turbines in each of the five lease areas (30 per lease area, 200 turbines total) and maximum number of turbines within each of the five lease areas (200 per lease area, 1,000 turbines total). The minimum and maximum range for all of the technical parameters should be considered under these scenarios, such as the expected number of cables, mooring lines, offshore substations, seabed footprint radius and contact area, and turbine spacing. As noted above, **the Council recommends the DPEIS Alternatives include sub alternatives that analyze the minimum and maximum design specifications (i.e., technical specification values and spatial layouts) as described in the RPDE. The analyses of each sub-alternative should be quantitative to the extent possible and draw on published impact analyses.**

Section 2.1.2.1 – Construction

The DPEIS mentions that lessees may use high-voltage direct current (HVDC) technology for transmission. Later in the DPEIS (Section 3.3.7.4.1) it notes that HVDC converters (if used) offshore would require cooling systems. The DPEIS also notes, "Since this PEIS precedes any project-specific COP submission, detailed information about HVDC cooling systems is currently unavailable." The Sunrise facility off the east coast plans to use an offshore converter station and information about that cooling system, utilizing sea water, is available in its COP. Materials submitted during the environmental review process of that project indicate the maximum daily flow rate will be 8.1 million gallons per day with an average utilized flow of roughly 4 million gallons per day. The anticipated temperature of the discharged sea water will be between 86- and 90-degrees F.

Our primary concerns are the entrainment of larval fish and the discharge of heated seawater that could be more than 40°F higher than the ambient water temperature and considered a pollutant when significantly higher than ambient temperature. If multiple OSW projects on the West Coast utilize offshore converter substations (OCSS) these impacts could be widespread and substantial. **The Council recommends additional analysis to assess the effects of OCSS on the marine environment and the application of methods that control/minimize the temperature of discharged seawater.**

Section 2.1.2.2 – Operations and Maintenance (O & M)

This section opines a lessee would be anticipated to regularly inspect WTGs (wind turbine generators), offshore substations, substructures, mooring lines, and anchors to check their condition and determine if maintenance is needed." Given the problems with the Block Island Wind Farm and cables becoming unburied, the **Council recommends lessees be required to inspect mooring line, transmission cables, and anchors on regularly scheduled intervals, annually for example, or after a significant and unexpected event such as a major earthquake, major storm, or tsunami warning issued after seismic events elsewhere along the Pacific Rim.**

Section 2.1.2.3 – Decommissioning

Full decommissioning should be a requirement. Retirement in place, though a potential option if permitted by BOEM or the Bureau of Safety and Environmental Enforcement, should not be

allowed within the California Current Large Marine Ecosystem.

Section 2.3 – Impact-Producing Factors

Marine debris resulting from OSW development is not included in the table of impact-producing factors (Table 2-5). **The Council recommends that marine debris is added as an impact-producing factor, is included in the impact assessment, and mitigation measures to monitor, reduce and offset impacts from marine debris are included in Appendix E.** Additionally, adverse effects from the combined activities noted in the RPDE have not been described or analyzed in the DPEIS.

In summer 2024, a turbine failed and significant amounts of debris were deposited into the ocean. This eventually led to the closure of beaches on the East Coast. Other sources of marine debris could include:

- Items on WTGs or substations that are washed into the ocean during storms or other similar events.
- Items on vessels servicing the OSW facility that fall into the ocean.

Section 2.4 – Non-Routine Activities and Events

Table 2.6 (Non-routine activities and events) identifies cable displacement or damage by vessel anchors or fishing gear as such an activity or event. **The Council recommends removing "by vessel anchors or fishing gear" as there are other potential sources of damage or displacement**.

Table 2.6 also identifies severe weather and natural events as such an activity or event. The DPEIS speaks to the highly unlikely structural failure of a WTG. If a WTG collapses it is likely that other WTGs connected to that WTG may be pulled down with it. **The Council recommends weak links in any cables connecting WTGs so that if one comes down, they all do not collapse**.

<u>Chapter 3 - Affected Environment and Environmental Consequences</u>

In the Council's view, the purpose of the PEIS is to conduct a broad, yet substantive impact analysis of OSW development offshore of California to serve as the foundation (tiering off) of project-specific NEPA analyses to ensure effective mitigation measures. To be of value, the PEIS would provide a preliminary quantitative analysis of the impacts (individual and cumulative) on the Affected Environment, incorporating the quantitative technical specifications, spatial configuration, etc. of a representative project (as presented in the RPDE) and factoring in additional risk factors associated with OSW (e.g., artificial reef effects on predator concentration) and environmental risk factors (e.g., marine heat wave, ocean acidification and hypoxia, etc.). Such an analysis depends on a thorough synthesis and quantification of all available information in the Affected Environment (e.g., geology, habitats, species/communities, oceanography, human use, etc.). This should include the geology, geomorphology, habitats, nursery areas, species communities by habitat type, methane seeps, kelp, and seagrasses, as available in publications and reports (for example, BOEM's site characterization reports for the Morro Bay WEA (Cochrane et al. 2022, Kuhnz et al. 2021). Quantifying impacts at each NEPA stage will help improve mitigation measures, and in the Council's view, is the primary benefit of a tiered NEPA approach.

Section 3.1.1 – Activities Terminology

The Council recommends including the following to the list of non-offshore wind activities and environmental stressors: Marine Protected Areas, Migratory routes for protected species, and the California Coastal National Monument.

Section 3.1.2 – Impact Terminology

The DPEIS uses "Undetectable", "Noticeable", and "Appreciable" to describe the impacts of the Proposed Action and each alternative in relation to ongoing and planned activities. **The Council recommends providing citations in regulation that define these terms.**

Physical Resources

Section 3.2.1 - Air Quality and Greenhouse Gas Emissions

The California Air Resources Board (CARB) recently amended its regulations for commercial harbor craft. It is unclear if the DPEIS incorporated those, particularly how it may impact vessels planned to be utilized during all phases of the OSW development process.

The description of net emissions estimates reported later in this section does not specify if the estimates include emissions generated from shipping raw materials or component parts across the Pacific Ocean for OSW development. **The Council recommends including emissions related to all activities associated with OSW development in the net emissions estimates. Different**

Section 3.2.2– Water Quality

The Affected Environment for water quality depicted in Figure 3.2.2-1 is a 10-mile radius around the lease areas and representative ports but does not include the full spatial extent of possible transmission corridors where accidental spills could occur during transit between representative ports and lease areas. It is also insufficient given the prevailing weather conditions in the area and the potential for negative impacts beyond 10 miles in the event of a spill of oil or other pollutants. On October 3, 2021 an oil spill off Huntington Beach, California resulted in a fisheries closure encompassing 650 square miles.[4] **The Council recommends expanding the Affected Environment for water quality to include the entire area anticipated for transmission infrastructure for California lease areas and include discussion of potential water quality impacts while in transit between California lease areas and representative ports.** This would entail revising subsections under Section 3.2.2 to describe (and quantify as applicable) the affected environment, baseline conditions, and impacts.

The Council recommends the Oceanographic Monitoring Plan include pre-construction water quality monitoring for a minimum of 3 years to establish baseline data collection prior to any activities, operational monitoring (i.e., continuous monitoring between post-construction and decommissioning), and water quality measurements as listed in the Impact

[4] https://www.nbclosangeles.com/news/local/fishing-allowed-to-resume-along-stretch-of-orange-county-coast-near-oil-spill/2769117/

Indicator column of Table 3.2.2-5. The Oceanographic Monitoring Plan should also include a data management plan to ensure standardized reporting, QA/QC of data, etc. **The Council recommends the DPEIS analyze potential impacts on Harmful Algal Blooms, Ocean Acidification, and Hypoxia**

Biological Resources

Section 3.3.2 – Benthic Resources

As nearly all benthic resources are EFH, many of our comments in this section are also applicable to Section 3.3.5.

The Affected Environment for benthic resources depicted in Figure 3.3.2-1 is a 10-mile buffer around both the Humboldt and Morro Bay WEAs plus export cable corridors between the WEAs and the shoreline that are roughly 20 mile-wide (north-south) for the Humboldt WEA, and roughly 30-mile wide (north-south) for the Morro Bay WEA. This implies there will be no transmission infrastructure of any kind (cable corridors, substations, etc.) beyond the Affected Environment depicted in Figure 3.3.2-1. However, at a recent MPC meeting (Dec. 5, 2024) BOEM stated that cable corridors would not be limited to the area delineated in Figure 3.3.2-1. Additionally, PNEL presented potential transmission scenarios to the MPC that included offshore "points of interconnection" as far north as the central coast of Oregon (MPC meeting Aug 12, 2024). **The Council recommends expanding the Affected Environment for benthic resources to include the entire area anticipated for transmission infrastructure associated with lease areas in the Humboldt WEA and Morro Bay WEA. This would entail revising subsections under Section 3.3.2 and Section 3.3.5 to describe (and quantify as applicable) the affected environment, baseline conditions, and impacts.**

The Council finds the description of benthic resources (and essential fish habitat) lacks sufficient detail and characterization to support a meaningful impact analysis. As such, the impact analysis for benthic resources under each alternative is not a substantive analysis or synthesis of the available information but rather is a coarse qualitative description of a variety of impacts. A quantification of the impacts based on all available information will improve project-specific NEPA analyses that tier off the PEIS, as well as improve project planning and result in more effective mitigation measures.

The Council recommends the PEIS includes a detailed habitat-specific characterization of the benthic resources in the Affected Environment. This should include the geology, geomorphology, habitats, nursery areas, species communities by habitat type, methane seeps, kelp, and seagrasses, as available in publications and reports. For example, BOEM's site characterization reports for the Morro Bay WEA (Cochrane et al. 2022, Kuhnz et al. 2021). **Additionally, recommendations from said reports should be required of the lessees, such as completing additional ground-truth remotely operated vehicle operations to improve the biotic results and increase confidence in the spatial distribution of habitat classifications reported** (Cochrane et al. 2022).

The Council recommends the PEIS utilize existing publications and data to characterize and map baseline conditions of benthic resources and essential fish habitat in the PEIS. Baseline

conditions should be based on long-term (e.g., 30-year) period to account for natural distribution, rather than assuming the current status is representative of the distribution, particularly for living marine resources hit hard by recent anomalies (e.g., kelp beds).

Anchoring structures and cable installations are among the most damaging to benthic resources for which the DPEIS acknowledges but does not fully assess the range of likely impacts or how the degree of impacts differs among different benthic fauna. For instance, the DPEIS suggests that the increase in vessel anchoring during construction, O&M, and decommissioning would cause only short-term impacts on benthic resources while also stating that estimated recovery time for benthic communities could range from months to years depending on factors such as water depth, scarring depth, sediment type, and community composition. Even if vessel anchoring is temporary, impacts are likely to be long-term for sensitive, long-lived benthic resources such as deep-sea corals and sponges. Mooring anchors associated with each project are expected to cause long-term to permanent impacts. Associated catenary mooring systems will have the largest footprint with up to 12 mooring lines of chain dragging on the seafloor (that could total as much as 300,000m^2). The maximum area affected is expected to be 20 to 25 percent of the benthic habitat in each WEA. Three of the WEAs contain significant sensitive benthic habitat and rocky reef HAPC, however the DPEIS does not discuss the magnitude of potential impact on these resources. Likewise, impacts from export cable installation are described as temporary and localized to the cable corridor, but do not discuss the magnitude of impact on benthic habitats or benthic species along the route of potentially 270 nautical miles. Even if the installation process itself is temporary, it is likely to result in long-term significant impacts to sensitive long-lived species such as deep-sea corals and sponges. The scope and magnitude of impacts to benthic resources from anchoring and cable related activities has not been sufficiently discussed or quantified in the DPEIS.

The Council recommends the PEIS include a comprehensive description of the potential impacts on benthic resources and EFH in the lease areas and cable corridors from the various anchoring, mooring and cable components as presented in the RPDE. The PEIS should include a preliminary quantitative analysis of such impacts (individual and cumulative) using the min/max technical specification values and spatial layouts of a representative project (as presented in the RPDE). The analysis should also draw on published quantitative impact analyses. The analysis should include additional risk factors associated with OSW (e.g., artificial reef effects on species/predator concentration, turbine effects on upwelling).

Section 3.3.3 – Birds

Many seabirds found in the lease sites are protected under the Migratory Bird Treaty Act (MBTA), yet the Act is only mentioned twice in this Section, once in passing. More analysis is needed on potential impacts of OSW developments on seabirds covered under the MBTA.

Attachment 1 of the DPEIS provides Modeled Predicted Density of Representative Marine Birds in the Affected Environment for over 40 different marine bird species. Are predicted densities extended out for the entirety of the lease term considering potential impacts of changing ocean conditions on distribution of these species? **The Council recommends the PEIS consider likely change in marine bird distributions during the entirety of the lease term**. Different

Section 3.3.4 – Coastal Habitat, Fauna and Wetlands

The DPEIS does not describe potential impacts or mitigation for sensitive nearshore habitats, such as kelp or eelgrass, nor does it provide detailed maps of the distribution of these habitat types. Both kelp and eelgrass are designated groundfish HAPC and salmon HAPC providing habitat for feeding, rearing, shelter, cover and growth for various species and life stages. Impacts to eelgrass and kelp habitats could occur from trenching, placement and construction of export cables, connecting cables to onshore facilities, anchoring of vessels, dredging, and port development. The draft PEIS describes cable installation and maintenance as having only short-term impacts. However, if cables do not entirely avoid these highly sensitive and important habitats, there could be long-term significant impacts to those habitats and the species that depend on them.

The Council continues to strongly recommend that BOEM require sufficiently sized buffers around all HAPCs for all bottom-disturbing activities and for all phases of OSW development.

Section - 3.3.5 Fishes, Invertebrates, and Essential Fish Habitat

Habitat

All five lease areas overlap designated EFHCAs and HAPCs. The Morro Bay lease areas overlap the Big Sur Coast/Port San Luis EFHCA. The Humboldt lease areas overlap the Samoa Deepwater EFHCA and are located near the Mad River Rough Patch EFHCA which may factor into cable transmission routing. Important and sensitive EFH in the lease areas include substantial areas of hard substrate (e.g., rocky reef HAPC (including carbonate rock, rocky banks and canyons), bacterial mats, pockmark fields, biogenic habitats (e.g., corals and sponges), steep slope terrain, methane seep bubble plume sites with underlying methane hydrates. Transmission cable routes positioned in nearshore and estuarine waters have the potential to impact multiple HAPCs (kelp, seagrass, and estuaries) for groundfish and salmon species. There is inconsistency throughout the DPEIS about the nature and magnitude of impacts to HAPC and other EFH resources. Section 3.3.5.4.4 briefly notes that impacts to HAPCs during construction would likely be permanent, yet in other sections of the draft PEIS impacts are downplayed.

The Council recommends the PEIS include a comprehensive description of the potential impacts on EFH, with emphasis on HAPC, other sensitive benthic habitats and associated fish and invertebrate species in the lease areas and cable corridors from the various anchoring, mooring and cable components presented in the RPDE. The PEIS should include a preliminary *quantitative* analysis of such impacts (individual and cumulative) using the technical specification values and spatial layout of a representative project (as presented in the RPDE), and drawing on published quantitative impact analyses. The analysis should include additional risk factors associated with OSW (e.g., artificial reef effects on species/predator concentration, turbine effects on upwelling).

The Council recommends the PEIS incorporate the potential adverse impacts of offshore wind facilities described in Non-Fishing Impacts on Essential Fish Habitat (NOAA Fisheries 2022). The PEIS should also incorporate *specific and prescriptive* mitigation measures that address NOAA's recommended conservation measures. Among these are:

- Address the cumulative impacts of past, present, and foreseeable future development activities on aquatic habitats.
- Avoid placing cables associated with offshore wind facilities near HAPC and sensitive benthic habitats, such as SAV.
- Design mooring and anchoring systems to the minimum necessary for device stability, in order to minimize scour and avoid unnecessary alteration and conversion of benthic habitat.
- Conduct pre-construction biological surveys in consultation with resource agencies to determine the extent and composition of biological populations or habitat in the proposed impact area.
- Use the minimum practicable scour protection for turbines and associated structures and cables, in order to avoid alteration/conversion of benthic habitat.

Fish and Invertebrates

The DPEIS asserts that population-level effects to fish, invertebrates, and EFH are not expected when considering the potential impacts from OSW development to oceanographic processes like upwelling. However, there is currently not enough evidence to conclude that population-level effects would not occur from OSW development. The modeling studies conducted by Raghukumar et al. 2023 did not conclude how changes in upwelling metrics would impact primary productivity or cascading ecological effects to upper trophic levels but rather states that: "*no attempt is made to infer the ecosystem response based on changes to physical oceanographic processes. The accurate inference of ecosystem responses requires the specific computation of phytoplankton, zooplankton, and higher trophic level responses to physical driving factors, which is beyond the scope of this study*." End-to-end ecosystem models (e.g., Ecopath with EcoSim, ECOTRAN, Atlantis) could be used to investigate potential water column ecosystem impacts (phytoplankton to mammals, fisheries and seabird biomass changes) due to turbine placement and subsequent wind alterations. **The Council recommends the PEIS discuss and prioritize the need for both additional predictive modeling studies building off the findings of Raghukumar (2023) as well as the development of a regional oceanographic monitoring plan to capture changes in upwelling metrics and productivity in the California Current Ecosystem. Modeling studies should incorporate climate change projections. The Council recommends this topic be analyzed in Section 3.2 Physical Resources.**

The Council agrees with the spatial extent of the Affected Environment for fishes and EFH depicted in Figures 3.3.5-1. The document states the analysis "focuses on fishes and invertebrates that would likely occur in the vicinity of the Humboldt and Morro Bay lease areas and, thus, potentially be affected by future wind energy development." It is assumed the time frame includes the entirety of the lease term so that species not likely to occur in the lease sites today; but may during the lease term given changing distribution of certain species, are analyzed.

When discussing noise (WTG operations), the DPEIS states "operational noise from floating WTGs of the size proposed has yet to be determined, but for the purposes of this analysis, noise impacts are assumed to be similar to those associated with bottom-founded WTGs." Yet two sentences above this, the DPEIS acknowledges, "At a wind speed of 50 feet per second (15 meters per second) operational noise levels (for floating WTGs) were found to be about 3 dB higher at the semisubmersible foundations (148.8 decibels referenced to a pressure of 1 microPascal [dB re

1 μPa]) as compared to spar-buoys (145.4 dB re 1 μPa). **The Council recommends any final PEIS consider the elevated levels of noise generated by floating WTGs.**

The Council recommends adding an additional Mitigation Measure which requires lessees to develop a fish monitoring plan in coordination with NMFS, state agencies, and other interested stakeholders. The purpose of fish monitoring would be to identify any negative impacts to fish stocks resulting from OSW developments. This could include comparing and contrasting pre-development fish presence with fish presence post construction. This will help inform whether, or to what degree, OSW facilities are acting as Fish Aggregating Devices or whether they are causing fish to leave the area.

Section 3.3.6 - Marine Mammals
The DPEIS states distribution for Guadalupe fur seals in California waters extend as far north as the Farallon Islands. The very next sentence states, "Between 2015 and 2021, an unusual mortality event for Guadalupe and northern fur seals was declared when 715 Guadalupe fur seals were stranded in California, Oregon, and Washington." Clearly distribution of Guadalupe fur seals in California extends to the California/Oregon border.

Table 3.3.6-2 describes issues and indicators to assess impacts on marine mammals. When discussing underwater noise from construction, operations, and decommissioning, the DPEIS notes that [i]mpacts on individuals and their habitat could have population-level effects, but the population can sufficiently recover from the impacts or enough habitat remains functional to maintain the viability of the species both locally and throughout their range. While development of the 5 leases offshore California may ensure enough habitat remains functional, it is unclear whether full buildout along the U.S. west coast (25GW off California, 3GW off Oregon, and 3GW off Washington) will provide necessary habitat for marine mammals. **The Council continues to strongly recommend an analysis of potential impacts to all resources from a full build out along the west coast.**

Section 3.3.6.4.1 (Impacts of One Representative Project in Each WEA) includes the following: "It is estimated that 2 percent of all fishing gear is lost annually, encompassing 1,144 square miles (2,963 square kilometers) of gillnets; 28,977 square miles (75,049 square kilometers) of purse seine nets; 84 square miles (218 square kilometers) of trawl nets; 459,554 miles (739,583 kilometers) of longline mainlines; and over 25 million pots and traps (Richardson et al. 2022)." The Richardson report referenced is entitled, *Global estimates of fishing gear lost to the ocean each year*. Unless estimates of gear loss for the Affected Environment can be provided, this is misleading and should be removed or clarified that it estimates annual gear loss across the globe.

This same Section identifies secondary entanglements as a long-term risk to marine mammals due to snagging of marine debris on lines in the water. Interestingly, secondary entanglements are not mentioned as a risk associated with array cables suspended in the water column. **The Council recommends including secondary entanglements under cable installation and maintenance.**

The potential impacts of noise to marine mammals, from multiple sources, is described in the DPEIS; but there is no mention of potential changes in migratory patterns of marine mammals. As will be more fully developed below, changes in the migratory patterns of marine mammals can

have profound impacts on west coast-based fisheries and fishing communities. **The Council recommends analysis of potential impacts to migratory patterns to marine mammals.**

Section - 3.3.7 Sea Turtles

When discussing potential impacts under either development alternative the DPEIS states, "[s]ea turtle impacts would be unlikely to result in population-level effects, although consequences to individuals would be detectable and measurable." According to the 2020 ESA status Review of Leatherback Sea turtles[5], the total index of nesting female abundance of the West Pacific DPS is estimated to be 1,277. According to this same report, the ratio of females to males visiting waters off California is 3 to 1. "[D]eclining nest trend and low reproductive output place the DPS at elevated extinction risk." For the critically endangered Leatherback Sea Turtle, even the loss of one individual could result in population-level effects.

Socioeconomic Conditions and Cultural Resources

Section 3.4.1 – Commercial Fisheries and For-Hire Recreational Fishing

We reiterate the incorporation of our previous comment letters submitted on OSW developments. Many of the items included in those comment letters are equally applicable here. We specifically call out potential impacts to primary productivity, changes in migratory patterns of whales and the potential impacts that will have on fixed gear fisheries (crab, groundfish, spot prawn, hagfish, and lobster), and potential for floating structures to act as Fish Aggregating Devices and how that could keep certain fish stocks from being available to the fishery.

The Council remains concerned about the propensity to analyze impacts to fisheries as a whole, rather than impacts to specific fisheries and gear types, when comparing the Alternatives. This tends to dilute impacts to specific fisheries, particularly those which are highly dependent on certain factors.

The DPEIS describes the Affected Environment for commercial and for-hire recreational fisheries as including "the waters within specific fishery management areas (i.e., Klamath Zone and Fort Bragg in northern California; Monterey in central/southern California), both of which are managed by the PFMC." **The Council strongly recommends the Affected Environment be amended to include the northern and central areas of the California Current Large Marine Ecosystem (CCLME). This would align with the Affected Environment for Fish as described in Section 3.3.5.** Many fisheries which operate in the WEAs attract commercial fishermen outside of the Humboldt and/or Morro Bay Areas. Commercial and recreational fishermen targeting North Pacific albacore will travel great distances for the opportunity to make a catch. Additionally, commercial fishing vessels utilizing gear types which will be unlikely to operate within a wind farm (trawl, purse seine, fixed-gear) will be forced to relocate their operations to other areas. Fishermen already operating in those areas will suffer from compaction and increased competition.

Section 3.4.1.1 identifies major commercial fisheries offshore California. Missing from this list is purse seine fisheries for market squid, CPS and tunas. There is also a growing hook-and-line

[5] 2020 ESA status Review of LST

fishery for tunas, particularly Pacific bluefin tuna in Central and Northern California. As that stock continues to recover and expand its range, it is likely more effort will be put into target Pacific bluefin tuna. The DPEIS also fails to identify the transboundary nature of the North pacific albacore fishery. Vessels participating in that fishery can come from San Diego to Bellingham, Washington.

In November, NOAA published a Draft Programmatic Environmental Impact Statement for the Identification of Aquaculture Opportunity Areas in U.S. Federal Waters off of Southern California.[6] While these locations are not near any of the five lease sites, they are adjacent to the shipping lane running up the coast from the Port of Los Angeles/Long Beach. Given the likelihood of the Port of Los Angeles/Long Beach being utilized for the three leases off Morro Bay, **the Council recommends potential development of aquaculture within those areas be covered in this Section, or in a separate Section**.

The Council appreciates including 10-years' worth of landing and ex-vessel revenue data in characterizing fisheries operating near the WEAs. The Council notes the directed fishery for Pacific sardine has been closed since 2015. This important commercial fishery may not be adequately characterized as is evidenced by still contributing 3.2% of the landings by weight even in the absence of the directed fishery for a majority of the timeframe analyzed.

Section 3.4.1.1.3 discusses commercial fisheries in the lease areas. While we agree that bottom trawling is one of the primary fisheries in the water depths found in the WEAs, fisheries for Highly Migratory Species, North Pacific albacore in particular, is another fishery operating in such depths. There are a number of reasons why fish harvested off California may be landed outside the State (landing taxes, homeported elsewhere, presence or condition of portside infrastructure), so reliance on CDFW commercial fishing block data may be misplaced. Before finalizing the PEIS, BOEM should incorporate information from the PacFEM project NMFS is still working on.

The Council recommends the following changes to Table 3.4.1-10 - Commercial fishing gear types, primary species landed, and typical depth ranges fished in the Morro Bay WEA Affected Environment:

- **For seine and other nets add skipjack tuna, bluefin tuna, and Pacific sardine.**
- **For hook-and-line (trolling) remove swordfish and add yellowfin tuna and skipjack tuna**
- **For hook-and-line (bottom fishing) remove opah**
- **For Gillnet add bluefin tuna and California yellowtail**

Section 3.4.1.1.5 discusses for-hire recreational fishing. While anglers on for-hire trips may harvest mackerels, it is unlikely they will harvest (let alone target) anchovy or market squid. CPS are an important live bait for the for-hire recreational fishing industry. CPS utilized for live bait are primarily anchovy, Pacific sardine and market squid. This same Section identifies butterfish, flying fish and Pacific saury as species typically taken during day trips. This is incorrect. **The**

[6] https://www.fisheries.noaa.gov/resource/document/draft-programmatic-environmental-impact-statement-identification-aquaculture

Council strongly recommends BOEM conduct additional outreach with the for-hire recreational fleets before finalizing the PEIS.

Section - 3.4.3 Demographics, Employment, and Economics

Section 3.4.3.1 describes the Affected Environment. The document notes that neither Monterey, Santa Barbara, nor Orange County have local ports; but they do have vibrant and important local harbors.

The geographic analysis area is flawed in that it fails to account for the economic impact of the project in areas where the primary commercial impact on fishing communities will be felt. Namely, the commercial fishing port(s) and harbors where the fish caught within or adjacent to the WEAs are landed. A significant economic impact felt by fishing communities affected by OSW developments will be felt in smaller harbors up and down the California coast and Southern Oregon.

When considering the impacts related to the presence of structure, the DPEIS states that each project would have 30–195 floating moored offshore wind structures and between one and six offshore substations, which could, in the short term, affect marine-based businesses including commercial and for-hire recreational fisheries. Given that the wind structure will be connected to the substation via interarray cables suspended in the water column, there will be long-term (life of the project) impacts to commercial fisheries using specific gear types.

When analyzing impacts of Alternatives B or C, the document fails to account for how negative impacts to the fishing industry will have negative impacts on demographics, employment and economics. An example we have cited in the past is worth mentioning again. If a vessel utilizing gear incompatible with an offshore wind farm is forced to relocate, the processor who depends on that fish may be forced out of business. This will have an impact on other fishermen who sold to that processor; but are not forced out of the area as they wind farm did not overly impact their operation(s). Without a market to sell to, that fisherman may be forced out of the area as well. This will have significant employment and economic impacts to the local seafood economy and may disproportionally impact people from Environmental Justice communities.

Section 3.4.7 - Navigation and Vessel Traffic

BOEM indicates it reviewed 4 years of Automatic Identification System (AIS) vessel traffic for this analysis. As we have highlighted, many commercial fishing vessels are not required to have AIS as they are not 65 feet in length or greater. Additionally, very few private recreational vessels (pleasure craft) utilize AIS. It is logical to conclude the information provided in Table 3.4.7-2 (Humboldt WEA—Number of AIS vessels for 2017, 2019, 2021, 2022) and Table 3.4.7-3 (Morro Bay WEA—Number of AIS vessels for 2017, 2019, 2021, 2022) grossly underestimates the number of fishing vessels in each of the lease sites.

When identifying potential impact of either Alternative B or C, the DPEIS noted an increased risk of incidents such as collision and allision, which could result in personal injury or loss of life from a marine casualty, damage to boats or turbines, and oil spills. The Council is very concerned about

the potential loss of life from offshore wind developments. Given this is mentioned as a risk related to the presence of structures, there does not appear to be any mitigation measures to avoid that risk. **The Council strongly recommends the establishment of adequate transit corridors within each lease site to ensure safe passage through a wind farm in prevailing weather conditions.**

Section 3.4.9 - Recreation and Tourism

When describing popular recreational saltwater species in the waters off the lease areas **the Council recommends adding North Pacific albacore tuna and an emerging fishery for Pacific bluefin tuna.**

Table 3.4.9-1 identifies recreational hotspots and popular activities in the Affected Environment. Fishing from the shore appears as a popular activity in just a few of the hotspots identified, **the Council recommends including fishing from shore in all of the hotspots.**

Section 3.4.10 – Scenic and Visual Resources

The Council appreciates the acknowledgement in Appendix F (Seascape, Landscape, and Visual Impact Assessment) that recreational users and people working in the marine environment will be visually impacted and that impact is deemed to be major. At the very least, 30 – 195 WTGs per lease with flashing red lights atop the structures will distort viewsheds. In addition, given the well documented impacts to marine radar systems from turbines, it creates another safety at sea concern.

Chapter 4 - Other Required Impact Analyses

Cumulative Impacts

The DPEIS defines reasonably foreseeable actions as *"those federal and nonfederal activities not yet undertaken, but sufficiently likely to occur, that a responsible official of ordinary prudence would take such activities into account in reaching a decision. The federal and nonfederal activities that BOEM must consider in the analysis of cumulative impacts include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by BOEM. Reasonably foreseeable future actions do not include those actions that are highly speculative or indefinite."*

The DPEIS does not analyze two major foreseeable Federal actions that are "*sufficiently likely to occur*" and are sufficiently likely to contribute to regional impacts off California. As stated in the DPEIS, "For the purposes of the draft PEIS, site characterization and site assessment activities of the two Oregon WEAs are considered reasonably foreseeable.", but since the Oregon WEAs have not been leased, BOEM considers the Oregon WEAs "too speculative to include as part of the baseline analysis of the California PEIS." The Council disagrees with this assessment. Not only does the draft PEIS identify some (though not all) potential cumulative effects associated with the Oregon WEAs (vessel navigation, vessel traffic, port utilization), but Oregon leases meet the criteria of "*sufficiently likely to occur*". Additionally, NOAA's Aquaculture Opportunity Areas (AOAs) are not included in the PEIS cumulative impact analysis, which are even closer to leasing and could contribute to regional impacts. **The Council recommends including the Oregon**

WEAs and NOAA's AOAs in the cumulative impact analysis. The Council recommends the cumulative impact analysis incorporate technical specifications from the RPDE. The cumulative impact analysis should consider quantitative impacts from multiple projects across the project's spatial extent.

Specific Comments – Volume II:

In 2023, the Council Coordinating Committee (CCC) published an Area based management report on the Conservation Areas in the U.S. Exclusive Economic Zone to catalog fisheries conservation efforts across the United States. (Area-Based Management — U.S. Regional Fishery Management Councils). This Report doesn't capture other measures; for example, the Loggerhead Turtle closure during an El Nino. The report, developed with standard methodology and scientific evaluation of expert Council staff, analyzed the number of geographical conservation areas- defined under "Ecosystem Conservation", "Year-round Fishery Management", "Seasonal Fishery Closures or Other"- per fishery management region in the U.S. EEZ. There are 106 conservation areas identified in U.S. West Coast marine waters.

Appendix A – Project Design Envelop (RPDE)

Table 1 of Appendix A provides ranges "of values for the physical design elements of floating offshore wind development in the California lease areas." While we understand the RPDE provides estimates of minimum and maximum values for project design parameters that are relevant for assessing environmental impacts, a few of those stand out:

- Each lease will contain between 30 and 200 wind turbine generators (WTGs) and one – six offshore substations
- Turbine spacing will be between 0.5nm and 1.6nm.
- There will be 3 – 12 mooring lines per turbine or substation each of which could have 1,000 meters of chain on the seabed that has a lateral range of motion of 50 meters at the touchdown point and is fixed at the anchor.
- Up to 2,700 nm of interarray cables each suspended in the water column at a planned depth of 200 ft (33 fathoms)
- Up to 40 offshore export cables totaling 8,639 nm.

The magnitude and spread between these values are so large, that impacts from a lease with 30 WTGs would be vastly different than a lease with 200 WTGs. As noted above, the Council recommends the DPEIS analyze the RPDE's minimum and maximum design element values under each Alternative.

A shortcoming of the RPDE is that it presumes the facilities will operate as planned. A recent article highlighted the underperformance of Equinor's Hywind Tampen 95MW floating offshore farm in the North Sea.[7] While the utilization factor was stated to be 50 percent in the Plan for Development and Operation, it actually came in at 38 percent. The reasons cited by Equinor include challenging weather conditions limiting maintenance and repairs, especially in winter; access issues to the turbines led to shorter time windows for maintenance; some electrical

[7] Equinor's Hywind Tampen underperformed in first year

components on the turbines had to be repaired due to technical issues; variations in the power forecasts and rapid reductions in wind strength created challenges for power production. Each of these is likely to be prevalent for the leases off California.

Appendix C – Planned Activities Scenario

The document incorrectly states "[t]here are no proposed or approved site assessment activities for any of the offshore California lease areas." Site assessment activities have been ongoing since 2024 in both the Humboldt and Morro Bay WEAs. The webpage for each leaseholder on the BOEM-California Activities website does not include any of the required Site Assessment Plans.

Section C.2.4, Hydrokinetic Energy Projects, correctly acknowledges "the United States does not have any commercially operating tidal energy power plants although several demonstrations projects are in various stages of development." In 2023, Governor Newsom signed into law Senate Bill 605. This requires the California Energy Commission to lead the evaluation of the feasibility, costs, and benefits of using wave energy and tidal energy and also identifying suitable sea space for offshore wave energy and tidal energy projects in state and federal waters. While there are no published plans for distributive or non-distributive hydrokinetic energy projects in waters offshore California, it is not unreasonable to assume those will happen in the future.

Section C.2.9.2, Fisheries Use and Management, correctly includes fisheries managed by the Federal Government. Missing is any discussion of state managed fisheries. Those could be impacted by cable routes and other potential rights of way.

Appendix E – Mitigation Measures

Forty Mitigation Measures (MMs) are identified in the DPEIS. Over one-quarter of those are merely recommendations to the leaseholder. MMs that are not required give very little comfort to those who are supposed to benefit from them. Table 3.4.1-14 lists the eleven MMs intended to minimize impacts to commercial and for-hire fisheries. Seven of those take the form of recommendations to lessees. The four that are proposed to be required include submission of an Anchoring Plan (MM 19), submission of a Sensitive Marine Species Characterization and Monitoring Plan (MM 20), monitoring of cables (MM 35), and development of an Oceanographic Monitoring Plan (MM 36). Only one of these, MM 35, would benefit fisheries provided the fishing community is given timely notification of any cables which become unburied or could otherwise interfere with fishing activities.

The Council proposes edits to the following MMs:

- **MM-19 (Vol I: Section 3.3.2.5.1)** identifies sensitive habitats as hard bottoms, hard grounds, reefs, hard corals, sponges, commercially important fish species and ESA-listed species. This is a subset of the sensitive habitats identified by the Council in previous comment letters, including comments on the NOI for this PEIS, Feb. 20, 2024). Furthermore, there are no sensitive habitat types listed in section 3.3.5.5 or MM-19 of Appendix E. **The Council recommends including a complete and consistent list of sensitive habitats in MM-19 and throughout the DPEIS so there is no ambiguity about which habitats require mitigation measures. Additional sensitive habitats that should be identified in MM-19**

include methane seeps and underlying methane hydrates (a component of Groundfish EFH), pockmark fields, EFH Conservation Areas (EFHCA), and all HAPC.

- **MM-19 (Vol II: Appendix E)** – The DPEIS requires that the Anchoring Plan require mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor but does not discuss the amount that bottom contact is reduced. The RPDE explains that taut mooring lines do not contact the seabed, whereas semi-taut lines lie on the seabed can have a maximum seabed contact area of 300,000 m^2. The DPEIS does not discuss whether mid-line anchor buoys can achieve the desired goal of taut mooring lines. **Given the substantial rocky reef HAPC and other sensitive habitats present in the WEAs, the Council recommends the PEIS thoroughly analyze mooring line impacts and discuss all feasible options for achieving taut mooring lines. The PEIS should specifically require taut mooring lines as a mitigation measure.**
- The Anchoring Plan should require maps at a large enough scale to ensure anchoring equipment is installed at the prescribed distance from sensitive habitats. MM-19 requires lessees to submit plats (maps) at a map scale of 1 inch = 1,000 feet (300 meters) following placement of anchoring equipment. At this scale, it will be challenging to visualize sensitive habitats for planning purposes and to validate that anchoring and other bottom-contacting equipment is sufficiently distanced after placement. Additionally, there is no required map scale for the "pre-installation" Anchoring Plan maps required with the COP. **The Council recommends BOEM require a map scale of 1 inch to 300 feet (91 meters) for all required maps (planning maps and post-installation maps) to enhance detection of sensitive habitats and verify that sensitive habitats are sufficiently avoided.**
- **MM-20 (Section 3.3.5.5 - Essential Fish Habitat)**. This measure requires lessees to submit a Sensitive Marine Species Characterization and Monitoring Plan, requires sensitive species to be "identified and avoided" and requires monitoring to evaluate mitigation efforts but the measure does not include any specifications or criteria to achieve these mitigation requirements: To "identify" sensitive habitats and species, high-resolution mapping and detailed biological surveys are necessary and should be required *in advance* of any bottom-contact activities. **The Council recommends the PEIS require lessees to conduct high-resolution seafloor mapping and biological surveys where such data do not already exist in the lease areas and transmission corridors *prior to* bottom contact activities to ensure sensitive habitats are identified. The Council recommends the PEIS require lessees to follow the guidance and standards for habitat mapping, seafloor classification, and biogenic habitats in the *NMFS Greater Atlantic Fisheries Recommendations for Mapping Fish Habitat*, modified as necessary for West Coast habitats and in consultation with West Coast habitat scientists to ensure data standardization across lease areas. 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.**
- To "avoid" sensitive habitats and species, prescriptive (measurable) mitigation measures are necessary, such as a specific-sized buffer for bottom-contact activities. The DPEIS includes no prescriptive measures and merely advises lessees to "avoid intentional contact". Three of the five lease areas (OCS-P 0562, OCS-P 0563, and OCS-P 0564) overlap substantial rocky

habitat (HAPC) that equate to approximately 50% in two of the lease areas. Additionally, the DPEIS predicts that "the maximum area affected by long-term to permanent anchors is expected to be roughly 20 to 25 percent of the benthic habitat in each WEA." An impact of this magnitude to rocky reef HAPC and other sensitive benthic resources is unacceptable. Avoiding sensitive habitats requires operational precision during staging and placement of anchors, anchor lines, trenching and placement of cable lines, and other infrastructure. Such precision is highly dependent on a multitude of factors, including high-resolution mapping and observational data to locate sensitive habitats in advance of anchoring, trenching and other activities. Given the sheer volume of all activities expected, and the operational challenges working in the Pacific Ocean (e.g., operational precision, data resolution, ocean dynamics, etc.) a prescriptive, sizeable buffer would provide consistent guardrails for all activities for lessees and reduce the likelihood of unintended impacts to important habitat. The consequences of not doing so are implied in Section 3.3.5.5 regarding anchoring at these lease sites: "The severity of impacts on sensitive benthic habitats would be reduced at OCS-P 0562, OCS-P 0563, and OCS-P 0564, *depending on the efficacy of avoidance*."

The Council continues to strongly recommend avoidance of HAPC and other sensitive habitats (corals, sponges, methane seeps, etc.) during all phases of OSW development. The Council strongly urges BOEM to require a prescriptive buffer of at least 1,000 feet around all sensitive habitats for all anchoring activities, and require sufficiently sized, prescriptive buffers for all other activities, in consultation with state and Federal agencies.

The Council proposes adding the following new Mitigation Measures:

- **Any unavoidable impacts to eelgrass should be mitigated following the guidelines of the California Eelgrass Mitigation Policy (CEMP, 2014). Lessees should refer to the Kelp Restoration and Management Plan being developed by CDFW for mitigating impacts to kelp habitat. The PEIS should include a map of the current and historic distribution of eelgrass and kelp habitat in the Project area.**
- **The Council recommends the PEIS include the following mitigation measures regarding oceanographic processes**:

    - 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.

- The DEIS delineates a general area around Humboldt Bay and Morro Bay for connecting cables to shore but does not specify locations where cable landings will occur, since this will be determined by individual lease holders. **The Council recommends the PEIS include a mitigation measure to avoid cable landings near river mouths or bay entrances, as EMFs may interfere with salmonid migration and feeding.**

- The Council appreciates the inclusion of MM-1 and MM-2, which require near real-time and long-term passive acoustic monitoring (PAM) for cetaceans. However, MM-2 requires lessees to monitor baseline presence of marine species for only 1 year before construction and for at least 10 years of operations. **The Council recommends a minimum of three years of baseline data collection and that post-construction monitoring is required for the lifetime of the project (including during decommissioning activities). Additionally, the Council highly recommends a regional monitoring approach for data standardization across lease areas.** To reduce opportunities for take of these marine mammals and sea turtles, BOEM should not allow any construction, operations, or decommissioning activities to take place when humpback whales, blue whales, fin whales, or leatherback sea turtles are present. California's RAMP regulatory framework would be an appropriate model.

Appendix H - Background on Underwater Sound

The content in this Appendix is highly technical; but resonating throughout is an acknowledgement of challenges in drawing any conclusions given the unknowns and lack of well-developed science in this field. Particularly concerning is the statement that "to date no research has been published on potential stress responses to elevated noise" in sea turtles, especially given the highly endangered Leatherback Sea Turtle is known to forage off the California coast. The drift gillnet fishery for HMS was excluded from the Pacific Leatherback Conservation Area to protect that species even though interactions with that gear type were rare. BOEM should prioritize understanding the potential impacts on Leatherback Sea Turtles from construction and operation of a wind farm off the California coast so that we do not push that species further towards extinction.

Appendix M – Supplemental Information

Section M.1.2.7, Extreme Storm Events, limits the discussion to tropical storms. Tropical storms are those that originate over warm tropical oceans and have maximum sustained surface winds of 39 to 73 miles per hour. A number of storms with such maximum sustained surface winds hit the California Coast on an annual basis. Simply because such a storm did not originate over warm tropical waters should not exclude it from being deemed an extreme storm event. **The Council recommends this Section be revised to include an analysis of such storms.**

Section M.1.4, Potential General Impacts of Offshore Wind Facilities on Meteorological Conditions, discusses the wake effect, citing a 2005 paper from Christiansen and Hasager. Missing from this discussion is a 2022 paper from the same author, Christiansen, which discusses wind wake effect in more detail and even concludes that "surface temperature primarily increases in the vicinity of offshore wind farms" due to the wind farm wake effect and that the resulting "large-scale surface heating of up to 0.1 degrees C imitates the effects of climate change."[8] Also missing are a number of other studies looking at wake effects and potential environmental harm to the marine ecosystem that could result. **The Council recommends this Section be amended to include more up-to-date information**.

[8] https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.818501/full

Thank you for consideration of these comments. Please contact Kerry Griffin (Kerry.Griffin@noaa.gov) on Council Staff with any questions or concerns.

Sincerely,

Brad Pettinger
Council Chair

KFG:kma

Cc: Council Members