



Pacific Fishery Management Council

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Marc Gorelnik, Chair | Merrick J. Burden, Executive Director

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Mr. Doug Boren
Pacific Regional Director
Bureau of Ocean Energy Management
760 Paseo Camarillo, Suite 102
Camarillo, CA 93010

Re: Bureau of Ocean Energy Management's *Request for Information and Nominations: Commercial Leasing for Wind Energy Development on the Outer Continental Shelf Offshore Oregon*

Dear Mr. Boren,

The Pacific Fishery Management Council (Council) appreciates the opportunity to comment on the Bureau of Ocean Energy Management's (BOEM) *Request for Information and Nominations: Commercial Leasing for Wind Energy Development on the Outer Continental Shelf Offshore Oregon* (Call). The Council offers the following comments which describe the Council's major concerns and recommendations for future actions related to Oregon Call Areas.

On April 29, 2022, BOEM published the Call, inviting "*comments and information regarding site conditions, resources, and multiple uses in close proximity to or within the Call Areas.*" The purpose of the Call is to collect information regarding several items of particular interest to the Council, including:

- Geological, geophysical, and biological conditions, activities, uses of the Outer Continental Shelf (OCS) including fishing use, fishing gear, and navigation;
- Data and information concerning renewable energy resources and environmental conditions, other relevant socioeconomic, cultural, biological, and environmental information;
- Information on coastal or onshore activities needed to support offshore wind development, such as port and transmission infrastructure, and associated potential impacts to recreation, scenic, cultural, historic, and natural resources, relating to those activities; and
- Any other relevant information BOEM should consider during its planning and decision-making process for the purpose of identifying areas to lease in the Call Areas.

The Council has been very engaged in the Pacific Coast offshore wind (OSW) planning process and anticipates continued engagement as BOEM moves forward with OSW development planning, leasing, and related activities. The Council submitted a [comment letter](#) to BOEM on November 24, 2021, describing several areas of concern and making several recommendations for moving forward. Attached to that November 24, 2021, letter were other comment letters the Council has submitted on Pacific Coast OSW development, and we ask that those be incorporated by reference.

In this letter, we reiterate many of our previously expressed concerns as many of these have yet to be addressed in BOEM's process. The Council recognizes and appreciates that the proposed Bandon Call Area was removed from further consideration, based on substantial input regarding concerns for important fish habitat and important fishing grounds.

There continues to be a high degree of concern over engagement with fishing communities and the adequacy of the information and analysis available for evaluating impacts on fisheries. The Council highlights these concerns and sees them echoed in recent letters sent to Director Lefton by members of the Oregon and Washington congressional delegations.

The decision on where to locate Wind Energy Areas (WEAs) is of the highest consequence to fishery participants, fishing communities, and the Council. There is no more important factor than location in terms of how fisheries will be affected. Once WEAs are identified, the opportunity to compare and contrast alternative project locations is effectively foreclosed by the planning process. Therefore, as elaborated upon below, the Council believes more focused analysis and engagement is necessary before WEAs are identified. Adverse effects on fishing communities are likely to be irreversible and long-lasting. BOEM should take the time to ensure that the decision on how to meet wind energy goals while minimizing adverse impacts to fisheries is open, transparent, and thorough.

Lastly, the Council understands BOEM is unlikely to switch to a programmatic approach to environmental impact analysis, but nonetheless echoes the belief that it would be an improvement. The current process leaves detailed environmental impact analysis to the very end, and again, when the time and funding expended effectively forecloses the consideration of alternative project locations and when an action alternative would appear to be all but a forgone conclusion. A programmatic approach would better account for reasonably foreseeably wind energy acreage needs and improve public understanding of the likely cumulative impact to the California Current and its fishing communities.

Council Authorities and Responsibilities

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) governs marine species and fisheries management in U.S. federal waters (3-200 nm offshore) and provides 10 National Standards for fishery conservation and management, including requiring the prevention of overfishing, using best available science in decision-making, providing for the sustained participation of fishing communities in fisheries, and promoting the safety of life at sea. We consider the MSA, related regulations, and the National Standards fundamental to our purpose and actions. The Council has responsibility to manage marine commercial and recreational fisheries in a manner that:

- Ensures a sustainable and safe domestic seafood supply and cultural benefits from fisheries, by achieving and maintaining, on a continuing basis, the optimum yield from each fishery;
- Protects ecosystem health and sustainability, including protection of essential fish habitat (EFH) and ecosystem services; and
- Minimizes long-term economic and social effects to fisheries and fishing-dependent communities, in part by improving the ability to adapt to climate change and competing ocean uses.

Essential Fish Habitat

The EFH provisions of the MSA promote the conservation of fisheries species by requiring fishery management councils to describe, identify, conserve, and enhance EFH for Council-managed species. As defined at 50 CFR 600.10:

Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. For the purpose of interpreting this definition of essential fish habitat: “waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.

The MSA also requires Councils to identify actions that could have adverse impacts on EFH. Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. 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 (50 CFR 600.810). The MSA authorizes the Council to comment on actions that may affect the habitat, including EFH, of a fishery resource under its authority (Section 305(b)(3)(A)) and requires the Council to comment on actions that may significantly affect the habitat of an anadromous fishery resource under its authority (Section 305(b)(3)(B)).

EFH Conservation Measures

Consistent with 50 CFR 600.10, the Council describes EFH conservation measures in its fishery management plans (FMP). Specific to the groundfish FMP, Essential Fish Habitat Conservation Areas (EFHCAs) are spatially discrete areas of particularly sensitive or productive benthic habitats where fishing with some or all types of bottom-contact gear is prohibited. Habitat areas of particular concern (HAPCs) are specific habitat features or spatially discrete areas of EFH that meet a set of criteria for designation: important ecological function, especially sensitive, vulnerable to degradation, or particularly rare habitat. Activities that could affect HAPCs receive greater scrutiny during EFH consultations. HAPC designations for groundfish are rocky seafloor, canopy kelp, seagrass, estuaries, and unique areas such as seamounts and canyons. HAPC designations for salmon are kelp, estuaries, spawning habitat, submerged aquatic vegetation, complex flood channels, and thermal refugia. Many other important habitat features are included in the overall description of EFH, including methane seeps, sand, mud, and coral/sponge habitats.

Offshore Wind Planning Process Concerns

According to the Call, “*the identification of the Call Areas is a result of data and information received throughout the planning effort from 2020 through 2022.*” However, not all data and information provided has been applied to the identification of Call Areas and significant analysis remains to be done to identify vulnerable areas of ecosystem resources and fisheries to inform the placement of WEAs. In proceeding toward the competitive leasing stage, the public notice states

that BOEM will consider “*all information received in response to the Call during area identification*” including “*Task Force input, Tribal input, ocean user input, and stakeholder input.*” **The Council strongly recommends data gathering and analysis pertaining to siting be conducted during Area Identification, prior to designation of WEAs; appropriate siting of WEAs is crucial to avoiding and minimizing impacts to natural resources and existing ocean users.** To determine areas most appropriate to establish WEAs, BOEM should evaluate potential impacts to habitat and fisheries, including socioeconomic effects and other likely impacts resulting from OSW energy development.

WEA Siting Analysis

The Call Notice states that BOEM intends to use the information received from this Call and other input from interested parties to inform its decisions on area identification for WEAs. To date, BOEM has not explained *how* the information will be used to inform their decision on the location, size, and configuration of the WEAs. The Council **recommends** that during this Area Identification phase, BOEM conduct a robust *geospatial compatibility analysis* that incorporates all relevant data (ecosystem resources, fisheries, and socio-economic) and associated impact risks to identify areas where wind farms, ecosystem resources, and existing ocean uses can successfully coexist. BOEM should consider collaborating with the National Centers for Coastal Ocean Science on marine spatial planning for wind energy development and utilize their modeling methods and scenario analyses for finding win-win solutions that avoid or minimize spatial conflicts.

The Council’s overarching opinion is that OSW energy development is likely to have significant effects on existing fishing practices as well as important habitats that support commercial, recreational, and Tribal fisheries. The BOEM process should include a comprehensive analysis of potential impacts resulting from the development and operations of OSW facilities prior to establishing WEAs, rather than waiting until energy companies have bid on and won the rights to develop portions of the ocean. Once WEAs are designated, BOEM has stated it will conduct an Environmental Assessment (EA). However, we are concerned that the resulting EA may not provide the kinds of analyses necessary to characterize the potential impacts and mitigation strategies for OSW site assessment. An Environmental Impact Statement (EIS) may be a more appropriate approach during the Area Identification stage, under the National Environmental Policy Act (NEPA).

Engagement

The Council appreciates and values the efforts that BOEM staff have made to participate in Council meetings, coordination calls, and engagement. However, some segments of fishing communities continue to feel unheard. The MSA defines a fishing community to include processors, vessel owners, and others who are involved with or dependent on seafood production. The BOEM process should ensure adequate meaningful engagement with all segments of the fishing community¹, not just the fishing participants themselves. The Council is willing to assist

¹ Magnuson-Stevens Act (MSA) defines a fishing community as “...a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.” In interpreting this definition, National Marine Fisheries Service has stated that “A fishing community is a social or economic group whose members reside in a specific location.” This interpretation means that a fishing community exists in a specific place.

in finding a structure that offers an improved process for the fishing industry and fishing community, and to ensure that all necessary fishery information is included in BOEM's OSW planning process. We are fully supportive of BOEM's plans for sector-specific engagement, including recreational, Tribal, and subsistence fisheries at the local and regional levels which, for some sectors, should include adjacent states. For example, the commercial albacore fishery includes participants ranging coastwide from San Diego, California to Washington state. In addition to engagement with the albacore fleet(s) based in Southern Oregon, the rest of the fleet should be provided with a meaningful way to communicate their ideas and/or concerns.

To the extent the Council, through its Ad Hoc Marine Planning Committee (MPC), can assist in facilitating those conversations and/or connecting BOEM with other institutions (e.g., Sea Grant, West Coast Oceans Alliance, etc.) or fishing associations, we stand ready to provide that assistance. However, BOEM must be cognizant that there are state-managed fisheries such as Dungeness crab, pink shrimp, and market squid that also make use of the Call Areas but are managed outside of the Council process. A revised engagement approach may slow the overall process, but the result would benefit both BOEM and fishing stakeholders, and there would be greater likelihood of producing information that would improve decision-making.

The Council **recommends** that BOEM continue to emphasize the importance of meaningful engagement throughout OSW leasing and development, including:

- Lease stipulations and authorizations to construct OSW projects should require engagement plans for the entire life of project;
- Leases should include requirement to establish cable routes and landing sites in accordance with state policy and the priorities of local communities; and
- Include plans for meaningful, ongoing engagement related to monitoring, reporting results, and adaptive management throughout the life of the project.

Adverse Effects and Potential Impacts

The Council appreciates BOEM's mandate of developing OSW while minimizing interference with other reasonable uses of the ocean; however, the Council remains concerned that potential future impacts on fish, fish habitat, and fishing activities are not fully understood or evaluated by BOEM. It is important to identify potential impacts of OSW now, so that research, monitoring, and OSW siting can proceed according to BOEM's OSW planning goal of minimizing impacts to the ocean and existing users. As stated above, more analysis should be completed before establishing WEAs, consistent with principles of avoidance and minimization of the impacts of WEAs on habitats, fisheries, and ocean ecosystems. These additional analyses may necessitate extending the timeline between Call Areas and WEAs.

Impacts to Fishing Activities

Excepting albacore, other highly migratory species, and some groundfish most Council-managed fishing activity takes place in waters shallower than 1300 meters. The Council is concerned that the areas identified for siting wind energy infrastructure may overlap significantly with important fishing areas. If overlap is substantial and fishing effort is restricted in proximity to wind energy facilities, then fishing activity will be displaced, effort will be constricted potentially into less desirable areas, gear and fishery conflicts will increase in nearshore areas, and fishing impacts on habitat may increase in the reduced areas available to fishing. Recreational fishing activity, and

therefore the economic benefits derived from such, may be reduced in southern Oregon ports if OSW areas limit transit. We also note that direct impacts on fishing activities have indirect carry-on effects to fishing-dependent communities, including seafood processing facilities and other marine-related businesses due to decreased fishing activity.

For example, the Call Areas encompass historically important Pacific whiting (hake) grounds at all depths. It is important to note that due to non-whiting bycatch constraints, whiting fishermen seek out areas that are often less productive for whiting but which produce less bycatch. Therefore, it is critical to identify areas that may not include fishing grounds of high productivity for target species, but grounds that allow vessels to avoid bycatch of constraining species. BOEM should explore this facet of the Call Areas in greater detail with the groundfish and whiting fleets. This is a critical component of harvest strategy.

In addition, any major decrease in production in this important harvest area could lead to plant capacity reductions or closures and/or consolidation of processing, and at-sea processing vessels would likely cut the number of processing vessels deployed, commensurate with harvest reductions. This would further reduce the fishing opportunity for Oregon-based fishing vessels.

Spatial displacement of fisheries and the economic value they provide to coastal ports and communities are not easy to quantify, but consistent with the NEPA process, a range of potential economic impacts should be part of a cumulative analysis completed before WEAs are identified to avoid or minimize those losses. The Council's Ecosystem Working Group notes in its [March 2022 C.2.a, Supplemental EWG Report 2](#) that, *"simply quantifying where fishing is occurring today or has occurred in recent years may underestimate the socioeconomic effects of any closures due to: 1) eroding the portfolio of fishing location choices, and 2) potential additional effects of moving and concentrating fishing effort outside closed areas."*

For Oregon, much of the fishing effort displaced from the Call Areas would, by necessity of fish congregations or regulatory actions, increase in the nearshore areas. Conflicts between various fishing sectors, such as sport and commercial, groundfish, and Dungeness crab, etc., would be exacerbated. These kinds of conflicts and changes reduce operational flexibility. The Council's Groundfish Advisory Panel [March 2022 C.2.a, Supplemental Report 1](#) indicates that, *"forcing fisheries into less productive grounds increases operational costs because more time is spent catching fewer fish. More time on the grounds increases safety risks, which are already heightened because of the navigational obstacles presented by [offshore wind] placements."*

It is incumbent on BOEM to explore these deeper socioeconomic relationships in coastal ports beyond the revenues paid directly to fishermen. As the Council has stated in prior correspondence (most recently in a January 2022 [letter](#) regarding Morro Bay WEA), ex-vessel revenue totals fail to capture the true economic impact of fisheries to coastal communities. Processors, buyers, fuel docks, marine equipment suppliers, and employees specializing in marine work to fishing vessels are also negatively affected. Hard asset values such as fish plants, fishing vessels, and Limited Entry Permits all could see diminished asset values as would as housing, schools, ports, and local businesses. BOEM should carefully consider not only the displacement of fishermen, but also the potential effects the businesses in nearby ports and communities that may be located in adjacent states.

Seafood processors and buying stations are located on docks and in ports to offload fresh seafood; they cannot move. Buying stations and processors may face closure or increased costs to obtain the kinds of seafood needed to supply their market demands if fishermen are displaced. These brick-and-mortar businesses have evolved to serve the communities and, by proxy, provide the public at large access to a publicly held resource managed by the Council and National Marine Fisheries Service (NMFS). These resources guarantee our Nation's food security for a long-term sustainable supply of seafood with a minimal carbon footprint.

Recreational fishing activity and the associated economic benefits may be reduced in southern Oregon ports if OSW areas limit vessel transit. For example, the Coos Bay Call Area represents a significant safety risk (and greater potential economic harm) to sport and commercial fishing albacore vessels fishing out of Winchester Bay. It is roughly 20 nautical miles (23 statute miles) from the mouth of the Umpqua River at Winchester Bay to the northeastern corner of the Coos Bay Call Area; it is roughly 33.8 nautical miles (39 statute miles) to the southeastern corner of the Coos Bay Call Area. Commercial, private, and charter albacore fishermen will have to travel miles out of their way – either north or south – to access the tuna fishing grounds typically found in deeper waters. With no transit lanes through the Call Area, these vessels have a greater chance of encountering inclement weather, especially during the spring and fall weather transitions. This represents a serious safety risk.

Additionally, both private and charter fisheries are important components of Oregon fishing communities, but the available data representing them is currently insufficient. Some Oregon Department of Fish and Wildlife (ODFW) recreational fishing data is included in the OROWindMap resource; that is, albacore charter fishing and recreational bottomfish (see: <https://bit.ly/315XHvu>). Charter fishing for albacore is evident throughout most of the Coos Bay Call Area and in the northern part of the Brookings Call Area. Therefore, we **recommend** BOEM engage with southern Oregon sport and commercial fishermen to determine how best to accommodate fishermen's safe transit to fishing grounds through the Coos Bay and Brookings Call Areas and for reducing economic harm to the fleet and communities. We further **recommend** that WEAs should be designed to accommodate transit corridors. These could serve to minimize impacts to vessel transit and could benefit search and rescue operations, scientific surveys, and could possibly allow for commercial fishing activities.

We understand that BOEM, through other requests for information related to potential offshore wind areas, notes that many commercial vessels that fish in the Call Areas carry automatic identification systems (AIS). Data included in OROWindMap reflects BOEM's reliance on AIS (and, to an extent, vessel monitoring systems (VMS)) to identify vessel traffic operating within the Call Areas. BOEM combines that with other fisheries-dependent data to confirm which fisheries operate in those areas. Though not identified in the Oregon Call, the Council reiterates that AIS and VMS likely underestimate the number of commercial vessels fishing in those areas, and the navigation patterns of those vessels, because: 1) AIS is only required on commercial fishing vessels 65 feet or more in length (33 CFR 164.46); and 2) not all commercial vessels are required to carry VMS. Similarly, most recreational vessels don't carry AIS and none are required to carry VMS. Beginning in 2016, commercial fishing vessels 65 feet or greater were required to have AIS. However, many commercial fishing vessels operating in and around the Call Areas are under 65

feet, and thus not required to use AIS. BOEM **should** include all commercial and recreational fishing vessels in the evaluation of impacts on marine navigation, not just those with AIS. BOEM should consult the [Pacific Fisheries Information Network \(PacFIN\)](#) APEX Reporting System, the [Recreational Fisheries Information Network \(RecFIN\)](#), and fishing communities for data on major navigation routes for these vessels. In addition, the Council **recommends** that BOEM conduct participatory mapping or similar activity in partnership with industry and the recreational sector to better understand the spatial overlap of fishing activity from multiple fisheries and sectors in the Oregon OSW Call Areas. We also **recommend** that BOEM utilize predictive analyses with regard to displacement of fishing sectors and related factors such as increased travel risks and additional costs (fuel, labor, etc.).

Habitat and Ecosystem Concerns

EFHCAs and HAPCs occur within and adjacent to the Coos Bay and Brookings Call Areas. The Council **recommends** that these conservation designations be protected from OSW activities (including site assessment/site characterization) that could harm these habitats. The Council also **recommends** that WEAs be located with sufficient distance from these conservation designations or buffer these areas to minimize adverse effects from wind farms. In the process of Area Identification, BOEM should also consider the likely cable routes in proximity to these conservation designations and ensure there are adequate cable route options for avoiding sensitive habitats (e.g., rocky reef).

The Council is concerned about habitat resources in the Coos Bay Call Area. Heceta Bank is one of the most productive and biodiverse regions on the Oregon continental shelf, fueled by ocean dynamics and circulation patterns unique to this region that also triggers seasonal hypoxia in some areas of the Bank, including in the area bisected by the Call Area. Recent analyses indicate that turbine arrays can create wind deficits downwind of the arrays up to several miles and may affect ocean dynamics and ecosystem function in surrounding areas (Akhtar et al. 2021, Lloret et al 2021). The potential loss of ocean productivity on or near Heceta Bank is a primary concern of the Council and should be a high priority analysis during the area identification phase. Understanding wind deficit effects on ecosystem processes in this region will be important to BOEM's decision on the placement and configuration of WEAs in the Coos Bay Call Area.

Additional habitat concerns for the north section of the Coos Bay Call Area include rock/boulder/cobble habitat, areas of high coral/sponge density and high habitat suitability, as well as concentrations of methane bubble plumes. These habitats may be particularly vulnerable to activities related to site assessment and characterization and the installation of wind energy structures. Information needs regarding ocean dynamics and habitat resources are further discussed under Data and Information.

The Council **recommends** excluding the far northern area of the Coos Bay Call Area from WEA designation until the effects of wind farms on ocean processes and habitats are sufficiently assessed in this region and determined to be minimal. The Council also **recommends** excluding or buffering major areas of high habitat suitability for corals or sponges in the western portion of the Call Area.

The Council has similar concerns for the north end of the Brookings Call Area which bisects Rogue Canyon and Rogue River Reef, a region of enhanced ocean productivity and biodiversity. As

discussed above, wind deficits (“wind wakes”) resulting from the presence and operation of wind farms could be detrimental to ocean processes and ocean productivity. Loss of ocean productivity in and around the Rogue River EFHCA is a primary concern of the Council and should be a high priority analysis. Additional habitats of concern in the northern area of the Brookings Call Area are the EFHCA and rock HAPC, methane bubble plume sites concentrated at the head of Rogue Canyon, and areas of high coral/sponge density and habitat suitability. Wind energy activities (seismic testing, drilling or other site characterization activities, wind energy implementation and maintenance) are likely to affect those habitats. The Council **recommends** excluding the northern area of the Brookings Call Area from WEA designation until a full impact analysis has been conducted to determine the ecosystem effects of wind farms on ocean processes and habitats in this region and determined to be minimal. The Council also **recommends** excluding or buffering major areas of high habitat suitability for corals or sponges in the southern portion of the Brookings Call Area.

It is also essential to the Council that BOEM analyze and avoid the coastal and onshore impacts of activities needed to support OSW development related to these Call Areas. This includes channel deepening that can dramatically alter estuarine hydrology and ecosystems. Estuaries, eelgrasses, and other submerged aquatic vegetation are HAPCs which will be affected by such activities.

To summarize, it is the Council’s view that wind energy development may not be compatible with the sensitive habitat resources in and near the Oregon Call Areas (i.e., EFHCAs, HAPCs, rocky substrates, coral/sponge habitats, methane seeps and upwelling zones). The Council **recommends** that WEAs be located away from these habitat and ecosystem resources. To adequately inform BOEM’s decisions on the location and configuration of WEAs will require additional resource mapping during this current phase of BOEM’s process and should include methane seep bubble plume sites, Coastal and Marine Ecological Classification Standard (CMECS) classified seafloor habitat polygons, coral or sponge presence and suitability, and modeled wind wake effects on ocean processes in the affected region. If WEAs are not located away from these resources, the Council **recommends** applying sufficiently sized buffer zones around sensitive resources to minimize the effects from activities and operations associated with wind farms. Modeling and/or survey efforts may be necessary to determine the size and configuration of buffers.

Transmission Cables

The physical presence, installation activities, and potential maintenance of transmission cables and infrastructure can impact sensitive habitats. The Council anticipates that cables will be buried to the extent practicable to reduce operational conflicts with bottom fishing and that cable routes and landing areas will 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 such activity would present. 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** that BOEM require a

thorough analysis of seafloor conditions for cable burial during the site assessment phase and that the outcome of this analysis be described in the EA.

Cumulative Effects Analysis

The Council is concerned about cumulative impacts to habitats and ocean processes during all phases of BOEM's process, which includes site assessment, installation, operations and maintenance. Impacts to the seafloor (anchors, cables) and water column (mooring lines, floating turbine structures, support vessels) affect physical and biogenic habitats, while wind wake effects from turbine arrays (decreased upwelling, slowed currents, reduced larval and juvenile transport) could potentially affect ocean productivity. The cumulative effects of multiple OSW farms, developed over time, on the Pacific Coast should be included in such an analysis at the local, regional, and coastwide scale. The Council **recommends** that BOEM conduct a comprehensive cumulative effects analysis during the area identification phase to examine the likely combined effects of all activities associated with individual lease sales and multiple lease sales on ocean processes and habitats on the Oregon Coast and the California Current Ecosystem. The results of this analysis should be provided to the public prior to establishing WEAs. Because floating OSW is a nascent technology, modeling simulations should be utilized to better understand the level of risk to habitats and fisheries, as well as to the socioeconomics of coastal communities.

Impacts to Research, Monitoring, and Management

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 Oregon OSW Call Areas. These include the Joint U.S.-Canada Integrated Ecosystem and Pacific Hake Acoustic Trawl Survey, the West Coast Groundfish Bottom Trawl survey, and the Northwest Fisheries Science Center/Southwest Fisheries Science Center (NWFSC and SWFSC, respectively) "Pre-recruit" groundfish survey. Data from these surveys spans decades of sampling. Exclusion of scientific survey vessels from OSW lease areas would directly impact these extensive sampling time series. These multi-decadal data streams feed directly into the assessment and management of some of the region's most valuable fisheries species, and disruptions of these data streams would directly impact the Council's ability to sustainably manage those fisheries, including cooperative and international treaty fisheries management. However, the impact of these surveys extends beyond the Council's primary use for harvest and stock assessment; these surveys also represent a somewhat rare long-term data series that inform the impacts of climate and ocean change and will be our best source to inform the effectiveness of management approaches to address ocean change in the future. As data uncertainty increases, management (for both stock assessment and other uses of the long-term data series) becomes more precautionary if there is less confidence in the stock assessments, leading to decreased harvest potential and the economic impacts that conveys. The Council **recommends** that BOEM ensure that these critical NOAA surveys, as well as other scientific surveys implemented by universities and non-governmental organizations can continue. This implies working with survey Principals to identify and design WEAs (and eventually lease areas) 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.

Data and Information

The Council has identified additional data and information needs that should be obtained to inform site analyses and siting decisions. The Council **recommends** that BOEM consider the following habitat, fishery, and other information. Specific data needs and gaps should be rectified before WEAs are established.

Geological, geophysical, and biological conditions

While most of the specific potential impacts to marine habitats will be considered on a project-specific basis, the potential impacts of site characterization, surveys, and transmission cables should be considered as part of the site assessment and characterization activities. BOEM has funded region-wide habitat suitability modeling studies of benthic macrofauna, corals, sponges and other invertebrates (Henkel et al, 2020; Poti et al, 2020) that are not reflected in OROWindMap. High habitat suitability for corals and sponges appear to occur in the Oregon Call Areas. These models should be used to inform survey efforts, Area Identification, and site characterization.

Comprehensive high-resolution seafloor mapping and habitat classification is needed throughout the Oregon Call Areas and potential cable corridors to locate sensitive habitats and to support biological community characterization surveys. High resolution seafloor data should be used for Area Identification in advance of the leasing process to identify lease blocks that are incompatible for wind energy development. The Council is concerned that BOEM may not be using or providing all available seafloor habitat data.

Seafloor surveys conducted by BOEM, the United States Geological Survey (USGS), and the Pacific Marine Environmental Laboratory (PMEL) have occurred in the Oregon Call Areas, but those data are not in OROWindMap. The USGS, in cooperation with BOEM and Oregon State University, surveyed 255 square nautical miles of the Coos Bay Call Area in 2014 and produced maps of classified seafloor substrate and fish-invertebrate biotypes (Cochrane et al. 2017). Identified in the survey was a region of pockmarks of methanogenic carbonate clasts (indicative of active methane seepage) supporting commercially important rockfish and habitat forming crinoids that were determined to be significantly correlated. Pockmarks such as these can function as habitat “islands” in an otherwise unstructured expanse of soft sediment. The study authors discuss the significance of crinoids as rockfish habitat and suggest that crinoid-filled pockmarks may serve as important structural habitat linkages between the major offshore banks off Oregon in the absence of rocky habitat. Biogenic-habitat data acquired during the USGS 2014 survey and in any new surveys should be incorporated into OROWindMap. As pockmarks are likely to occur elsewhere in the Coos Bay Call Area and possibly the Brookings Call Area, these habitats when identified should be classified using the CMECS biotic component.

Additional data are available from extensive multibeam sonar surveys and mapping of methane seeps and carbonate deposits conducted off Washington, Oregon, and northern California in 2011, 2016, 2017 and 2018 (Merle et al 2021). When taken together, analyses of these surveys led to the discovery of over 1,000 new methane emission sites and over 3,000 associated bubble streams on the Cascadia Margin from the Strait of Juan de Fuca to Cape Mendocino. This network of methane seeps is the focus of ongoing oceanographic and climate research.

The Council designated methane seeps as groundfish EFH due to the ability of methane seeps and underlying methane hydrates to form carbonate hardgrounds (i.e., fish habitat) and support diverse biological communities (PFMC 2020). While there can be benefits gained from additional data collection at methane seep sites during site assessment, direct contact survey activities (e.g., grab sampling, benthic sleds, drilling, borings, large buoy anchoring) could potentially damage seep sites or interfere with ongoing research and must be carefully considered. Additionally, the potential for slope instability around methane seep areas is discussed in Merle et al (2021) and may be relevant to site assessment and effects analysis.

Additional seafloor mapping data have become available from NOAA's Pacific Marine Environmental Laboratory (PMEL) since the publication of data in Merle et al (2021) that may be relevant to Oregon Call Areas and cable corridors (NOAA PMEL Ocean Environment Division). BOEM should consult with NOAA PMEL to evaluate existing gaps in the mapping of these features, and coordinate with PMEL and other researchers on additional mapping needs to identify where unmapped seeps, hydrates, and carbonate deposits are located in the Oregon Call Areas.

The Surficial Geologic Habitat map ("SGH-4") prepared by Goldfinger and incorporated into the BOEM report *Benthic Habitat Characterization Offshore the Pacific Northwest Volume 1: Evaluation of Continental Shelf Geology* (Goldfinger et al. 2014) interprets seafloor geology from multiple data types (high-resolution multibeam sonar data, backscatter data seabed grab samples, visual survey data, and biological samples) and the data are classified using the ecological components of the CMECS classification standard. The combined CMECS codes (subclass, subgroup, and modifier) provide the ecological relevance for describing benthic habitats, including many areas of rocky habitat that are obscured in the induration layer currently in OROWindMap (derived from SGH-4 map product). The Council **recommends** that all seafloor data, including data gathered or compiled since 2014 be interpreted using the CMECS codes noted above and be merged into an updated seafloor habitat map to provide the best available information for ecological and technical analyses, area identification, and leasing decisions.

As discussed above, the Council **recommends** the use of buffers around sensitive habitats if they cannot be entirely excluded from WEAs or cable corridors. The Council recommends that modeling and/or surveys may be necessary to determine the size of buffers to ensure adequate protection during all phases of OSW activities (i.e., site assessment/characterization, installation, operations).

Information regarding recreational and commercial fisheries

As noted above, better data on commercial and recreational fishing areas is needed to both plan locations of WEAs as well as determine impacts of WEAs on commercial and recreational fisheries. The Council advocates working with Pacific States Marine Fisheries Commission, NOAA Fisheries, and fisheries stakeholders to identify current, historical, and potential future fishing areas.

The Council advocates for ongoing coordination with BOEM on matters of OSW planning and development. As stated in the Call, "*Coordination with the National Marine Fisheries Service, the Pacific Fishery Management Council, the Oregon Department of Fish and Wildlife, the fishing industry and individual members of the fishing community is ongoing and will assist in further*

reduction of existing space-use conflicts during the planning and leasing process.” (Pages 9-10). The Pacific Fishing Effort Mapping (PacFEM) Project is led by NOAA Fisheries and the Pacific States Marine Fisheries Commission in partnership with BOEM, West Coast states, and the NMFS West Coast Region. The goal of the PacFEM project is to develop spatial data to support ecosystem management initiatives and marine planning in the West Coast region. A database is being developed to comprehensively join confidential fishery data from multiple sources, such as observer data, fish tickets, electronic trip reports, vessel monitoring systems, logbook data, and fishing revenue. A publicly accessible fishing effort mapping tool is being developed which utilizes the underlying confidential database that incorporates information from each data source available. The project is designed to inform socioeconomic impact discussions and to be used in siting discussions and decisions about WEAs, cable routes, and landing sites. The Council strongly **recommends** that the PacFEM data be analyzed during the siting of WEAs off Oregon and that area identification of those WEAs not be considered complete until PacFEM products are available and applied to inform responsible siting of WEAs off Oregon.

When considering potential impacts of Call Areas on fisheries, the assessment of impacts should be broken out by fishery and gear type and be done in such a way to show trends over time. To accurately reflect potential impacts, BOEM should look beyond the last decade for information regarding fisheries in the area, as the recent ten-year period has been a time of tremendous change for many West Coast fisheries and future years should be quite different from this time period. For example, Amendment 28 to our Pacific Coast Groundfish Fishery Management Plan, adopted in 2019, implemented changes to the groundfish fishery by providing increased access to productive fishing grounds where fish populations have rebounded in recent years. Incorporating fishery-data from years earlier than the recent ten-year period could be used to estimate potential impacts post-Amendment 28.

Commercial and recreational fisheries for highly migratory species such as tuna often take place in waters deeper than 200 meters and both permitted commercial harvesters as well as recreational fishermen and women have historic reliance on albacore tuna. This means that the commercial and recreational fisheries for highly migratory species would likely be negatively impacted by OSW development in the Call Areas at these depths. These impacts will be felt by vessel owners and operators, sportfishing landings, live bait providers, fuel docks, and local hotels and restaurants. Hence, analyses of potential impacts of the WEA need to integrate both spatial information of lost commercial and recreational fishing grounds and larger socioeconomic impacts of the fishery. Providing ex-vessel revenues is useful in determining the potential economic loss to commercial harvesters but fails to capture the true economic impact. Members of the dependent fishing community – buyers and processors, fuel docks, marine mechanics, restaurants, etc., could all be negatively impacted. As part of the planning and site characterization evaluation, potential impacts to commercial and recreational fisheries as well as associated industries should be evaluated.

Other relevant information and analysis

The Oregon Call Areas are in a globally recognized productive nearshore upwelling system, which are found in only a small portion of the world’s oceans. Seasonal patterns in upwelling and downwelling have been associated with a variety of ecological and biological factors that are tied to and correlated with the productivity of the system. It is with this context in mind that the Council shares concerns that offshore wind turbine arrays may change the delicate balance of the upwelling

system that makes the California Current so productive. While the research on this topic is nascent, the results are concerning – large turbine arrays will be detectable in the oceanographic system, however the degree to which these oceanographic disruptions may cause negative ecological impacts is less understood. Some studies indicate that OSW installations may reduce wind speed downwind of turbine arrays, possibly affecting upwelling/downwelling, surface currents, and temperature/salinity profiles (Ludewig 2015; Christiansen et al 2022). The potential effects of altered wind speeds on ocean processes in an area as large as the Oregon Call Areas, in a region dominated by and dependent on upwelling have not been studied. The Council **recommends** that BOEM conduct scientific analyses and/or modeling to assess potential wind-generated effects on ocean processes in this region of the California Current, and to build sufficient time into the leasing schedule to accomplish these tasks. Data products related to upwelling and associated environmental aspects such as primary production and hypoxia are available through PMEL.

Additional data and analysis are needed on cable routes, landing sites, and onshore infrastructure needs and the associated ecosystem and fishery impacts. The Council **recommends** that BOEM integrate outcomes from the United States Coast Guard Pacific Coast Port Access Route Study (PAC-PARS), when completed. According to the Call, BOEM considered transmission availability in the development of the Call Areas. If only two (Wendson and Fairview) of the five interconnection points are accessible to future WEAs sited off the southern Oregon coast, then far less energy produced by OSW could be integrated into Oregon’s power system without infrastructure upgrades or new installations. We **recommend** BOEM evaluate potential cable routes from WEAs to landing sites, considering onshore infrastructure needs, to assess higher and lower risk options for siting offshore WEAs.

Because any infrastructure project has a limited life span, and because there can be unanticipated damage to installations, leases should include financial guarantees to ensure decommissioning and clean-up of all offshore and onshore infrastructure after it has reached the end of its lifespan, has been damaged, or is otherwise no longer functional. The Council **supports** BOEM’s requirement in the lease provisions to provide financial guarantees to ensure responsible decommissioning of OSW projects and related infrastructure.

The Council urges BOEM to consider waters deeper than 1300 meters for OSW development, which would greatly reduce the potential impacts to fisheries. We note that some Call Areas on the East Coast include waters up to 2500 meters. We realize that the bathymetry, slope, and other seafloor characteristics are very different on the West Coast. Nonetheless, BOEM should consider the potential for OSW to occur in waters deeper than are currently being considered. Similarly, when BOEM establishes WEAs and lease sites, shallower areas where most sensitive habitats and much of the fishing effort takes place should be eliminated from consideration.

Summary

Below, we provide a general summary of the recommendations contained in this letter, related to the Oregon Call Areas and subsequent steps of Area Identification and future lease sales:

- Conduct comprehensive data gathering and analysis pertaining to siting, prior to designation of WEAs.
- During the Area Identification phase, conduct a robust geospatial compatibility analysis that incorporates all relevant data and associated impact risks.

- Emphasize and prioritize meaningful engagement throughout the OSW leasing and development process, including opportunities for open public communication with affected communities and fishing sectors.
- Engage with southern Oregon sport and commercial fishermen to determine how best to ensure safe transit to fishing grounds through the Coos Bay and Brookings Call Areas.
- Conduct participatory mapping or similar activity in partnership with industry and the recreational sector to better understand the spatial overlap of fishing activity from multiple fisheries and sectors in the Oregon OSW Call Areas.
- Utilize predictive analyses with regard to displacement of fishing sectors and related factors such as increased travel risks and additional costs.
- Avoid establishing WEAs in EFHCAs, HAPCs, and areas of dense coral/sponge habitat and concentrations of methane bubble plumes. Ensure a sufficient distance from these sensitive habitats. If avoidance is not possible, apply sufficient buffers to minimize adverse effects from wind farms.
- Exclude the far northern area of the Coos Bay Call Area from WEA designation until the effects of wind farms on ocean processes and habitats are sufficiently assessed in this region and determined to be minimal.
- Exclude or buffer major areas of high habitat suitability for corals or sponges in the western portion of the Coos Bay Call Area as well as the southern portion of the Brookings Call Area.
- Exclude the northern area of the Brookings Call Area from WEA designation until a full impacts analysis has been conducted to determine the ecosystem effects of wind farms on ocean processes and habitats in this region and determined to be minimal.
- Conduct a comprehensive cumulative effects analysis during the Area Identification phase to examine the likely combined effects of all activities associated with individual lease sales and multiple lease sales on ocean processes and habitats on the Oregon Coast and the California Current Ecosystem.
- Ensure that critical NOAA surveys, as well as other scientific surveys implemented by universities and non-governmental organizations can continue.
- Design WEAs to accommodate transit corridors, which could minimize impacts to transit, search and rescue, scientific surveys, and fishing activities.
- Ensure that specific data needs and gaps are rectified before WEAs are established.
- Utilize CMECS habitat classification system for ecological and technical analyses to inform area identification and leasing decisions.
- Analyze PacFEM data during the area identification stage to inform the siting of WEAs.
- Conduct scientific analyses and/or modeling to assess potential wind-generated effects on ocean processes in this region of the California Current.
- Integrate outcomes from the PAC-PARS initiative, when completed.
- Evaluate potential cable routes from WEAs to landing sites to assess higher and lower risk options for siting WEAs.
- Require financial guarantees in lease provisions to ensure responsible decommissioning of OSW projects and related infrastructure.

We appreciate BOEM's consideration of these comments. Please contact Mr. Kerry Griffin on Council staff with any questions (Kerry.griffin@noaa.gov; 503-820-2409).

Sincerely,



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