Oregon

Kate Brown, Governor

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June 28, 2022

BOEM

Submitted electronically in packet from Oregon Governor and agencies

To whom it may concern:

On April 28, 2022 BOEM published in the Federal Register a Request for information and Nominations: Commercial Leasing for Wind Energy Development on the Outer Continental Shelf Offshore Oregon (Docket No. BOEM-2022-0009). This call for information and nominations (Call) invites "*comments and information regarding site conditions, resources, and multiple uses in close proximity to or within the Call Areas*" by June 28, 2022. The Oregon Department of Fish and Wildlife (ODFW) is the state agency with management responsibility for fish and wildlife species and habitat as well as for recreational and commercial fisheries (ORS 496.012, ORS 506.109). We have worked with BOEM since late 2019 to encourage meaningful stakeholder engagement and data gathering, including participation in Task Force, PFMC/MPC discussions, webinars, submitting comments August 2021, providing data for OROWindMap, and others. ODFW understands that the purpose of the Call is to, in part "*collect information and feedback on site conditions, resources, and ocean uses within the identified area*" that will "*help BOEM determine areas that may be suitable for offshore wind energy development*". BOEM is requesting "*specific and detailed comments*" regarding several features, activities, or concerns in or around the Call Areas that are within ODFW's area of expertise and management purview, including:

- Geological, geophysical, environmental, and biological conditions (including bottom and shallow hazards and live bottom)
- Uses in or near the Call Areas including navigation, recreational and commercial fisheries, socioeconomic information, and recommendations for reducing use conflicts.
- 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.
- 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.

ODFW generally supports well-sited, adequately mitigated, and responsibly operated renewable energy developments. Well-sited, adequately mitigated, and responsibly operated renewable energy developments are:

1. sited in locations that avoid or minimize impacts on fish, wildlife, and their habitats;
2. assessed to determine how unavoidable impacts may be adequately mitigated;
3. implemented with temporally and spatially adequate mitigation in place; and
4. responsibly operated in compliance with regulatory requirements or conditions established to protect fish, wildlife, and their habitats.

ODFW is providing this input to BOEM on responsible development of offshore wind in alignment with our mission to protect and enhance Oregon's fish, wildlife, and their habitats for use and enjoyment by present and future generations.

ODFW acknowledges and, in many cases, shares concerns raised by stakeholders during the series of public meetings that have been convened in the last two months, since BOEM published Call Areas. As described by Oregon's coastal state legislators in a letter to BOEM (dated May 27, 2022), stakeholders are overwhelmingly concerned; individual ports, counties, fisheries associations and individuals have provided copious verbal and written comments, documenting their concerns about ecosystem and fisheries impacts, suggesting that BOEM slow down the timeline to allow for thoughtful OSW siting, and sharing frustrations with an apparent lack of response by BOEM to stakeholder concerns that have been raised.

In light of the above-described context, ODFW herein provides detailed but not comprehensive comments and recommendations, and requests that BOEM resolve these issues as recommended during Area Identification and before WEA(s) are finalized. ODFW recommendations are based on Oregon's relevant statutes, rules, and policies as well as the Territorial Sea Plan, the Geographic Location Description within the Oregon Ocean Stewardship Area, the Oregon Nearshore Strategy, and the Oregon Conservation Strategy; BOEM should strongly consider all of these policies and resource protections contained therein.

1. General Recommendations

1.1. Winnowing down during siting

According to the Call, "*Call Areas are of a sufficient size to allow for refinement during area identification, the next step in the leasing process after the Call. The wind energy Areas (WEA) that result for area identification will be smaller than the Call Areas in this notice. The WEA will be the subject of environmental review… In coordination with the State, BOEM is considering 3 gigawatts of near-term commercial development for the first leasing activities offshore Oregon. … Two Call Areas are included in this notice… the Coos Bay Call Area and the Brookings Call Area, which total about 1,159,298 acres (1,811 square miles) … The estimated offshore wind capacity of both Call Areas is about 14 gigawatts, assuming a power density of approximately 0.012 megawatts per acre (3 megawatts per square kilometer).*" At this time our expectation is

that BOEM will use comments received on the Call Areas and subsequent analysis of biological, physical, and socio-economic information to winnow down from the 1811 square miles for the 14 gigawatts (GW) Call Areas to a smaller area most suitable for WEA consideration. While the target size of the WEA(s) remains uncertain, the area(s) would be established with the objective of no more than 3GW of near-term development, which equates to up to 400 square miles based on BOEMs power density assumption. WEA(s) of this total size within one or both of the call areas will have impacts on resources and activities important to Oregon, as raised by ODFW and others (e.g., Task Force members, fishery representatives, environmental groups, state legislators, members of US Congress). Thoughtful analysis will be required during area identification and before WEA(s) are finalized to avoid those impacts to the maximum extent practicable, while addressing concerns from wind energy proponents that there is a need to start siting now. Winnowing down from the current large size (14GW) to a much smaller WEA(s) is consistent with Task Force discussion and expectations and will streamline future analysis by BOEM and the state. As stated in House Bill 3375, which provides for "planning up to 3GW" of offshore wind, if analysis shows that avoiding significant impacts in the current call areas is not possible, then WEA(s) less than 3GW could move forward now and future siting opportunities could be explored separately, but concurrently.

ODFW recommends that BOEM limit the size of the WEA(s) to no more than the size necessary to accommodate up to 3GW with room for micro-siting development, and that BOEM consider creating initial WEA(s) that are significantly smaller than 3GW in the current Call Areas as needed to avoid significant impacts.

1.2. Water depth

According to the Call, BOEM considered water depth in the development of the Call Areas. "Outreach and data gathering efforts conducted by BOEM and the State focused on areas with water depths up to 1,300 meters as a reasonable limit for near-term development of floating offshore wind energy facilities, based on the current technoeconomic feasibility as suggested by NREL in offshore wind cost modeling studies on the West Coast (see Wind resource and cost of energy section). On the westward boundary, partial OCS blocks within the Call Areas include 1,300 meter water depths. Future planning may consider additional areas in water depths greater than 1,300 meters." However, focusing WEA designation on the deeper western edge of the Call Areas or farther offshore then 1300 meters could avoid or reduce several conflicts with fisheries and ecosystem resources. Overall, based on data available on OROWindMap, it appears turbines would have fewer conflicts with many seabird species if they were located on the western boundary of the Call Areas (e.g. predicted seabird abundance "hotspots") or farther offshore than 1300 meters depth (e.g., Cassin's auklet, rhinoceros auklet, common murre). Excepting albacore and other highly migratory species, most fishing activity takes place in waters shallower than 1300 meters. Call Areas are being considered offshore of Delaware, Maryland, Virginia and North Carolina that begin 44 to 56 nautical miles from shore and extend out to 2600 meters deep (Docket ID BOEM-2022-0023). While the bathymetry, slope, and other seafloor characteristics are very different on the west coast, BOEM should consider the potential for OSW to occur in waters deeper than are currently being considered and publicly seek interest from potential developers for these deeper waters to determine viability for wind development and decreasing

conflict with fisheries and ecosystem resources. Areas being considered for siting wind energy infrastructure within 1300 meters depth may overlap significantly with important fishing areas.

ODFW supports statements made by Governor Kate Brown in her January 13, 2022 letter to BOEM and recommends that BOEM siting should consider areas that provide the flexibility for the potential use of waters beyond 1300-meter depth that could be technically and financially viable for development in the near or distant future. Additionally, ODFW recommends that BOEM publicly seek interest from potential developers for these deeper waters to determine viability for wind development and decreasing conflict with fisheries and ecosystem resources.

1.3. Cable route and landing site evaluation

In addition to offshore WEA(s), data and analysis are needed on cable routes, landing sites and onshore infrastructure needs. BOEM should consider nearshore and onshore areas appropriate for cable and facility siting while evaluating offshore areas for WEA(s). Per the Oregon Territorial Sea Plan (TSP) Part Four, cables "*shall be buried so as to ensure continuous burial*" and as such, should be routed around hard substrate. Cable installation methods are likely to suspend sediment for brief periods, and the settlement of that sediment may increase localized risks of smothering immobile plant and animal communities. Cable routes and landing sites should be sited to avoid rocky reefs, which are most prominent along Oregon's south coast. Shoreline cable crossings will most likely be installed via horizontal directional drilling and some of Oregon's coastal geology is less amenable to drilling activity. Because cable routes and landings need to avoid rocky habitat and other sensitive ecological areas, the number of potential suitable routes and landing sites is very limited. These limitations will influence the choice of optimal locations for development within Call Areas. In addition, according to the Call, BOEM considered transmission availability in the development of the Call Areas. "*NREL estimated that approximately 2.6 gigawatts of offshore wind could be physically integrated into Oregon's onshore power system without major trans-coastal upgrades or curtailments if it were distributed along five existing points of interconnection along the Oregon coast. Of the five points of interconnection studied by NREL, Wendson and Fairview are closest to the Call Areas*." If only two (i.e. Wendson and Fairview) of the five interconnection points are accessible to future WEA(s) sited off the southern Oregon coast, then far less energy produced by offshore wind could be integrated into Oregon's power system without further ecological impacts stemming from infrastructure upgrades or new installations. Oregon House Bill 2603 requires analysis of submarine cable permitting and revision of TSP Part Four, which will likely involve analysis of coastal geology and identification of potential landing sites that could minimize conflicts with habitat.

ODFW recommends that BOEM evaluate potential cable routes and landing sites and correlate offshore WEA(s) with onshore infrastructure needs to differentiate higher and lower risk options for offshore siting of WEA(s). ODFW recommends that BOEM coordinate with the state during Area Identification and before WEA(s) are finalized, to identify and evaluate least-conflict cable routes and landing sites, preferably informed by the state's in-progress analysis per House Bill 2603.

1.4. Data gathering and analysis needed

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*". ODFW submitted input to BOEM several times during this period in both written and verbal form. However, not all data and information provided has been applied and significant analysis remains to be done. At this time potential future impacts on habitats, species, and fishing activities have not been fully evaluated by BOEM. As stated in the Call, "*BOEM will use information and feedback resulting from this Call to inform the delineation of WEA(s) for environmental reviews for potential offshore wind leasing*." and "*may conduct visual simulations of hypothetical projects to inform the designation of WEA(s)*." Appropriate siting of WEA(s), transmission, and associated infrastructure is crucial to avoiding and minimizing risks to natural resources and impacts on existing ocean users. Analysis of adequate data and information is necessary at the siting stage to designate areas for responsible energy development. To determine which areas are most appropriate, specific data gaps should be rectified and analysis completed before WEA(s) are established which may necessitate extending the timeline between call areas and WEA(s). Assuming BOEM proceeds with the competitive leasing process, BOEM will consider "*all information received in response to the Call during area identification*" which is "*the process in which BOEM establishes WEA(s) based on information received on this Call, Task Force input, Tribal input, ocean user input, and stakeholder input. … After designating WEA(s), BOEM will conduct environmental analysis under NEPA*". The comments discussed below contain many recommendations for additional data analyses and considerations that should occur during Area Identification and before WEA(s) are finalized. ODFW may provide additional recommendations as BOEM proceeds with these analyses.

ODFW recommends that BOEM (and/or partners) conduct additional data gathering and analysis (as detailed herein) during Area Identification and before WEA(s) are finalized.

1.5. Suitability analysis

ODFW understands that NOAA's National Centers for Coastal Ocean Science (NCCOS) recently released marine spatial planning atlases for Aquaculture Opportunity Areas (AOAs) in California and the Gulf of Mexico that provide analysis of more than 200 datasets. NCCOS applied suitability models to weight and score data to map areas with lower and higher natural resource and ocean use conflicts. Methods were peer-reviewed and approved by the Center of Independent Experts and included extensive stakeholder engagement to strengthen the quality and credibility of the agency's science and improve stakeholder's trust that the agency is basing policy decisions on the best scientific information available. ODFW understands BOEM and NOAA are collaborating to develop a spatial suitability model for future WEA(s) in the Gulf of Mexico and the Central Atlantic, leveraging previous spatial analysis, data and modeling methods developed for AOAs. This collaboration is supporting more comprehensive spatial analysis during area identification for WEA(s) and transmission lines. ODFW understands that if time and funding were available, NOAA could perform this robust analysis in Oregon using peer-reviewed transparent methods to arrive at science-based conclusions about appropriate siting of WEA(s) and transmission to minimize conflicts.

ODFW recommends that BOEM provide resources to and collaborate with NOAA NCCOS to perform a suitability analysis off Oregon during Area Identification, to minimize ecosystem and use conflicts prior to delineation of WEA(s).

1.6. NEPA and cumulative effects analysis

Once WEA(s) are designated, BOEM will conduct a NEPA analysis. "*Previously when deciding whether and where renewable energy leases may be issued, BOEM has prepared an environmental assessment (EA) to consider the reasonably foreseeable environmental consequences of activities that take place after leasing, such as site characterization activities (including geophysical, geotechnical, archaeological, and biological surveys) and site assessment activities (including installation of a meteorological tower or meteorological buoy). BOEM may also conduct consultations. These consultations may include, but are not limited to, those required by the Coastal Zone Management Act, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act … Through the NEPA and consultation process, BOEM may identify mitigation measures to minimize possible environmental impacts resulting from project activities, such as impacts to migratory birds, marine mammals, and sea turtles*." It is unclear whether the WEA(s) delineated during Area Identification may be modified during this NEPA review prior to any areas being leased. It is also unclear whether a Finding of No Significant Impact (FONSI) would be appropriate and whether the resulting EA would provide the kinds of analyses necessary to characterize the potential impacts and mitigation strategies for offshore wind site assessment or if perhaps an Environmental Impact Statement would be better suited. In particular ODFW is concerned about cumulative impacts to habitats and ocean processes during the siting assessment as well as the installation and maintenance of many potential wind farms. For some fisheries or some species migrations the Affected Environment should encompass the entire Oregon coast and portions of adjacent states.

ODFW recommends that BOEM (and/or partners) conduct a robust cumulative effects analysis evaluating the effects of multiple activities on ocean processes and habitats on the Oregon Coast and throughout the California Current Ecosystem (Affected Environment) as soon as possible, and no later than during NEPA. This analysis should encompass all proposed, existing or reasonably foreseeable offshore wind sites off California, Oregon, and Washington, and spatial designations other than OSW that also may affect existing resources or existing uses within the Affected Environment.

1.7 Heceta Bank and associated area habitat exclusions

The Coos Bay Call Area eastern boundary is in water depths from 120 to 220 meters. The area extends from 13.8 to about 65 miles offshore and is about 67 miles long and 41 miles wide. The entire area is approximately 1364 square miles and has an estimated power capacity of 10.6 GW. This area overlaps with features of Heceta Bank, including rocky habitat, methane seeps and biogenic habitat as well as a unique recirculation pattern that intensifies during summer upwelling and affects nutrient and dissolved oxygen concentrations and temperatures. Heceta Bank is one of the most productive upwelling systems on the entire Oregon coast. Shoreward from the Coos Bay Call Area are beach, wetland, estuarine, and forested habitats that BOEM

should evaluate and minimize habitat impacts in cable routing, cable landing sites, and associated onshore facilities or transmission.

BOEM's intent was that the Coos Bay Call Area was delineated to remove Heceta Bank from consideration. According to the Call, *"Avian diversity and density generally decrease with distance from shore. The National Audubon Society identified Heceta, Stonewall, and Perpetua Banks as "Important Bird Areas," (http://www.audubon.org/important-bird-areas) citing the combination of productive waters and the activity of fishing boats drawing a diversity of seabirds. These three banks were removed from consideration for the Call Areas."* However, the southern flank is still included as are portions of Important Bird Areas (IBA, described below) such as the Heceta Bank IBA (Audubon, 2013a) and the Heceta Valley Cape Blanco IBA (Audubon, 2013b). These productive upwelling areas host 3 of the scarce records of short-tailed albatross along with large numbers of black-footed albatross, pink-footed shearwater, sooty shearwater, northern fulmar and Cassin's auklet (Audubon, 2013a). The northern portion of the Coos Bay Call Area extends up the southern slope of Heceta Bank and the northeast portion overlaps with productive foraging areas associated with the shelf break. If turbines were installed in this area they may interfere with migration between shore and important productive foraging areas. The southeastern portion of the Coos Bay Call Area falls within the Heceta Valley Cape Blanco IBA, and important feeding areas for the pink-footed shearwater (Audubon, 2013b).

ODFW recommends BOEM exclude from the Coos Bay Call Area the remaining portion of Heceta Bank and associated sensitive EFH areas (methane seeps, biogenic habitat, rocky reefs and canyons), and important seabird migratory/foraging corridors from further consideration.

1.8 Rogue Canyon and associated area habitat exclusions

The Brookings Call Area eastern boundary is in water depths from 125 to 340 meters. The area extends from 13.8 to about 46 miles offshore and is about 46 miles long and 22 miles wide. The entire area is approximately 448 square miles and has an estimated power capacity of 3.5 GW. According to the Call, BOEM considered seafloor slope in the development of the Call Areas. "*The slope of the seafloor affects the suitability of an area for offshore wind energy development. BOEM removed the Rouge* [sic] *canyon system, including canyon floors and walls, from consideration for the Call Areas due to the anticipated engineering challenges. Canyon systems have complex bathymetry and a density of slopes of greater than ten degrees that correlate with increased project cost and complexity*." The Brookings Call Area overlaps the Rogue River Reef EFHCA and rock habitat found therein, and is situated between Rogue Canyon and Rogue River Reef. Here too, wind wakes created by clusters of wind farms could potentially reduce wind speeds enough to impede upwelling across Rogue River reef. Methane bubble plume sites are clustered at the head of Rogue Canyon and also in the south of the Call Area. Shoreward from the Brookings Call Area are rocky shore, offshore island, headland, wetland, estuarine, and forested habitats that BOEM should evaluate and avoid in siting preferred cable routes, landing sites, and associated onshore facilities or transmission.

The Brookings Call Area is delineated to remove the Rogue canyon from consideration. "*The slope of the seafloor affects the suitability of an area for offshore wind energy development. BOEM removed the Rouge* [sic] *canyon system, including canyon floors and walls, from*

consideration for the Call Areas due to the anticipated engineering challenges. Canyon systems have complex bathymetry and a density of slopes of greater than ten degrees that correlate with increased project cost and complexity. A map of the Rouge [sic] *canyon delineation with the canyon floors and walls is available at https://bit.ly/3MxdNL9*." However, the northeastern portion of the Brookings Call Area is between the Rogue canyon and nearshore rocky habitat, both reef and rocky shore, that support an abundance of seabird nesting colonies and nearshore foraging areas. If turbines were installed in this area they may interfere with migration between the shoreline, nearshore and important offshore foraging areas.

ODFW recommends BOEM exclude the northern portion of the Brookings Call Area from further consideration due to its location within, between, and adjacent to highly productive areas with complex seafloor characteristics. Further, ODFW recommends BOEM exclude the northern part of the Brooking Call Area that is within the IBA between Rogue Canyon and a high abundance of shoreline seabird nesting colonies.

2. Habitat and Ocean Processes

2.1 Seafloor mapping and sensitive habitat identification

Oregon seeks to protect areas of rocky substrate, communities around methane seeps, biogenic habitats, productive pelagic areas, rocky shores, and sensitive onshore habitat from disturbance or development. This is consistent with ODFW policies in the Oregon Conservation and Nearshore Strategies, Habitat Mitigation Policy, and with the state's Territorial Sea Plan and Statewide Planning Goal 19. Comprehensive high-resolution seafloor mapping and habitat classification is needed throughout Oregon Call Areas and cable corridors to locate and avoid fragile habitats and to support biological community characterization surveys. ODFW has identified additional sources of seafloor data that are not in OROWindMap including BOEM-funded surveys, USGS and PMEL data, as described below. These data should be incorporated into analysis and used prior to delineation of WEA(s) because wind energy development may not be compatible with the presence of these important physical and biogenic habitat features, and should be sited to avoid offshore, nearshore and onshore areas within and around important habitat. Sensitive habitat features should be spatially delineated and a no-development buffer should be considered around these features, to avoid indirect impacts from OSW activities. In addition to Area Identification, nearshore and onshore habitat should be evaluated in areas where cable routes, cable landing sites, onshore facilities or transmission are being considered. This evaluation of nearshore and onshore habitat should coincide with Area Identification of offshore WEA(s) due to limited existing cable landing and onshore infrastructure to support the ontake of offshore energy.

ODFW recommends that BOEM (and/or partners) update seafloor data and identify sensitive habitats using updated information; this update should occur during Area Identification and before WEA(s) are finalized, so that the best available information is used to identify and exclude areas that will be incompatible with wind energy development (offshore, nearshore, and onshore).

2.2 Rock substrate

As described in the Call, "*The majority of the seabed within the Call Areas consists of soft sediments ... Rock outcrops may form reefs at any depth and occur over a much smaller percentage of the seabed, but are often concentrated in offshore banks. …Biodiversity and biological productivity show the highest values in reef habitats and in nearshore environments. Therefore, in addition to Heceta, Stonewall, and Perpetua Banks, Siltcoos and Coquille Banks were also excluded from consideration for the Call Areas due to their biodiversity. BOEM will continue to coordinate with DLCD on the definition and locations of sensitive or highly productive habitats and anticipates removing such areas during the planning and leasing process*." ODFW appreciates BOEM's efforts to identify and avoid these areas of high biodiversity and productivity. However, the northern portion of the Coos Bay Call Area encompasses rocky substrates that should also be avoided. Areas shoreward of both Call Areas include rock that should be avoided in the assessment of suitable cable routes. Rocky habitat is defined in the Oregon Territorial Sea Plan (TSP) Part Three, Rocky Habitat Management Strategy and includes headlands, tidepools, rocky beaches, cliffs, offshore rocks, islands, and reefs. The strategy is a combination of policies, objectives, and site-specific recommendations supported by scientific information designed to provide site-based management and protection of unique ecosystems along the Oregon Coast. Multiple rocky habitat management sites are designated and the goals for each designation to maintain, protect, or conserve natural systems may conflict with cable installation or landing sites. The Surficial Geologic Habitat SGH-4 map (Goldfinger et al. 2014) interprets seafloor geology from multiple data types and applies the ecological components of the Coastal and Marine Ecological Classification Standard (CMECS). The combined CMECS codes (subclass, group, subgroup and modifier) provide the ecological context necessary for identifying benthic habitats important to many marine species, unlike the induration classification scheme (hard-mixed-soft) that misidentifies many important rocky habitats.

ODFW recommends that all seafloor data, including any seafloor data gathered since 2014 be interpreted using the CMECS codes and be merged into an updated, comprehensive seafloor habitat map to provide the best available information for analyses, area identification and leasing decisions. ODFW supports statements made by Governor Kate Brown in her January 13, 2022 letter to BOEM, and recommends that rock reef habitat be excluded from consideration for inclusion in any WEA. ODFW further recommends that BOEM avoid rock substrate shoreward of both Call Areas during identification of cable routes and landing sites.

2.3 Carbonate/methane seep mapping

BOEM acknowledges that "*carbonate reefs can form where methane seeps occur."* Extensive multibeam sonar surveys and mapping of methane seeps and carbonate deposits were 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. In 2014, US Geological Survey (in cooperation with BOEM and Oregon State University) surveyed a portion of what is now the Coos Bay Call Area and produced maps of classified seafloor substrate and fish-invertebrate biotypes (Cochrane

et al. 2017). The survey identified pockmarks containing methanogenic carbonate clasts, (indicative of active methane seepage) that were significantly correlated with commercially important rockfish and habitat-forming crinoids. Pockmarks such as these can function as structural fish 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. Biogenic-habitat data acquired during the USGS 2014 survey should be incorporated into OROWindMap and be used to inform WEA siting. Pockmarks are likely to occur elsewhere in the Call Areas and should be a priority for seafloor characterization in regions of soft sediment. This network of methane seeps is the focus of ongoing oceanographic and climate research. Methane seeps are designated as groundfish essential fish habitat due to the ability of methane seeps and underlying methane hydrates to form carbonate hardgrounds (i.e., fish habitat) and support diverse biological communities. Many of these areas are in locations that current seafloor maps show as soft sediment (i.e., no reefs). BOEM's conclusion that Call Areas seafloor consists mostly soft sediment is based on low-resolution maps that do not show features such as carbonate reefs. While there can be benefits gained from additional data collection at methane seep sites during site assessment, some survey activities 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 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).

ODFW recommends that BOEM consult with NOAA PMEL and other researchers during Area Identification and before WEA(s) are finalized to evaluate existing information and gaps in the mapping of seep features. ODFW recommends that BOEM avoid or minimize impacts to these features within WEA(s) and cable routes.

2.4 Biogenic habitat

Portions of the Coos Bay Call Area, as well as of the Brookings Call Areas contain important and sensitive fish habitat. These include biogenic habitat associated with rock/boulder/cobble substrates, methane bubble plumes and areas of high coral and sponge density and/or habitat suitability for particular taxa (e.g., black corals, gorgonian corals, and glass sponges). These habitats may be particularly vulnerable to certain assessment activities such as seismic testing and drilling during site assessment and characterization and installations of wind energy structures. Many biogenic habitats are identified as essential fish habitat (EFH) and habitat areas of particular concern (HAPC) for species managed by the Pacific Fisheries Management Council. EFH conservation areas (EFHCA) protect important habitats that are particularly sensitive to disturbance and tend to be highly productive and biodiverse areas. HAPC are defined as particularly rare, significant to ecosystem function, or sensitive to disturbance. For groundfish species HAPC are rocky reefs, canopy kelp, seagrasses, estuaries and specific geologic features (seamounts, banks, and submarine canyons). Coral and sponge habitat exists in parts of both the Coos Bay and Brookings Call Areas and updated data are available on the NOAA Deep-sea Coral Research and Technology Program website (https://deepseacoraldata.noaa.gov/). In

addition, areas of high coral/sponge habitat suitability appear to occur in the Call Areas (Poti et al, 2020) however not all taxa relevant to the Oregon Call Areas are provided in OROWindMap for evaluation. In addition to avoiding direct impacts to these habitats, there should be consideration of a buffer around them to effectively protect them from site assessment, development, and operational activities.

ODFW recommends that BOEM conduct a careful impacts analysis of all available data representing biogenic habitats, including EFHCAs and HAPCs, and avoid or minimize impacts to these offshore and nearshore areas from site assessment/characterization activities (e.g., grab sampling, benthic sleds, drilling, borings, large buoy anchoring) and wind energy development; apply protections to the resource footprint and consider a protective buffer around them.

2.5 Circulation & upwelling

According to the Call, "*the majority of the identified Call Areas are in water depths greater than 130 meters*". Given the extent of in-water structure anticipated to secure floating turbines at these depths (e.g., mooring lines, floating turbine structures with ballast intakes, support vessels, monitoring equipment, marker buoys) pelagic habitat should also be considered in the siting of WEA(s). Productive areas within and around the Call Areas are important to fish and wildlife and are naturally variable. Wind-driven coastal upwelling is a primary driver of productivity in the California Current. ODFW is concerned that reduced wind speed downwind of turbine arrays could inhibit upwelling, disrupt circulation and alter productivity within and shoreward of future WEA(s). Data products related to upwelling and associated environmental aspects such as primary production and hypoxia are available through PMEL and NOAA NCCOS. ODFW is concerned that decreased wind speeds could also alter larval and juvenile transport of important species (e.g., Dungeness crab, sardine and anchovy). Analysis of these concerns could better inform siting and project design, which could minimize impacts to ecosystem function.

ODFW recommends that BOEM conduct scientific analyses and/or modeling to assess potential wind-generated effects on oceanic and ecological processes in this region of the California Current and consider the results of these analyses during Area Identification before WEA(s) are finalized.

2.6 Onshore sensitive habitat

ODFW understands that detailed analysis of potential impacts on onshore sensitive habitats is premature at this planning stage. However, consideration of where transmission cables and onshore facilities might be sited while avoiding or minimizing impacts on onshore habitats should be integrated into the initial siting of offshore WEA(s), garnering progressively more detail in subsequent stages of planning and analysis. The Call Areas are offshore of a stretch of Oregon's coastline from approximately Florence to Brookings, where a number of existing habitat types serve important functions to the production and survival of Oregon's fish and wildlife. In many cases, coastal habitats host intrinsically unique and sometimes expansive habitat features where installation of transmission or newly built facilities could be highly problematic or technically infeasible. For example the North Spit at Coos Bay is one of the only ocean peninsula land features in the state with estuarine, ocean, wetland, and upland habitats that

provide a number of strategic benefits for production of fish and wildlife. Native eelgrass (*Zostera marina*) stands in Oregon's estuaries provide critical cover for a number of fish and wildlife species, support for primary ecological production, and increased benthic complexity. Wetlands, streams, rock headlands and bluffs, and coastal forests provide important nursery, nesting and rearing habitat. The Oregon coast consists of long stretches of sandy beaches bounded by resistant headlands interspersed with rocky shores, mixed sand and gravel beaches. Most beaches of Oregon are backed by sea cliffs, which are particularly prominent along the south coast shoreward of the Call Areas. The "Coos Bay dune sheet" extends inland by as much as 2.5 miles and stretches nearly 60 miles from Coos Bay to Heceta Head (DOGAMI, 2022). This area is one of the largest expanses of temperate coastal sand dunes in the world encompassing tree islands, open dunes, wetlands, and beaches (USFS, 2022). Dunes, forests, and ocean in such close proximity to one another are rare and this area supports many species, including some found in few other places (USFS, 2022). Beaches and dunes support a number of bird species including the federally and state-listed western snowy plover. Onshore habitats (and for more information see the Oregon Conservation Strategy www.oregonconservationstrategy.org) include:

- sandy beach and dune
- estuarine: deep subtidal, intertidal, salt marsh, eelgrass beds
- freshwater aquatic: fish-bearing streams, anadromous streams and rivers
- wetland: bog and fen
- Rock headlands and bluffs
- forested upland and riparian

These subtidal, intertidal, and shoreline features provide important habitat for a number of culturally and economically important species of crab, clam, fish, birds and others. Estuaries, forested uplands and riparian areas, and especially coastal wetlands (bogs, fens) are increasingly valued for their role in carbon sequestration, recognized by Oregon in recent statewide recommendations for outcome-based goals designed to reduce Oregon's overall greenhouse gas emissions (OGWC, 2021). Areas in these categories that provide significant carbon sequestration function should be identified and avoided in offshore wind siting and transmission development stages.

ODFW recommends that BOEM site offshore WEA(s) based in part on an assessment of available opportunities for onshore transmission and facility siting capable of avoiding or minimizing impacts to onshore habitat, particularly for sensitive species and carbon sequestration habitats.

3. Fish and Wildlife Species

According to the Call, BOEM considered fish and wildlife species in the development of the Call Areas and expects to develop mitigation measures at subsequent phases. "*BOEM anticipates developing and imposing terms and conditions—including any measures necessary to mitigate potential impacts—at the leasing, site assessment, and/or construction and operations phases of its authorization process*." The Call identifies several species listed by the federal Endangered Species Act (ESA), many of which are also listed by the Oregon Endangered Species Act

((OESA) ORS 496.171 et. seq. & OAR 635-100) that requires state agencies to protect and promote recovery of state listed species.

3.1 Seabirds and Shorebirds

3.1.1. Important Bird Areas (IBAs)

Important Bird Areas (IBAs) are sites identified by the Audubon Society of Portland as important to bird conservation, scientific monitoring, and education (Audubon, 2022). Several IBAs have been identified in, near, or inshore of the Call Areas demarking significant offshore, nearshore, shoreline and onshore habitat values important to seabirds and shorebirds. In addition to IBAs, there are other productive marine areas important to offshore use by seabird species for foraging, including many that nest in Oregon. The nearshore marine environment along the Oregon coast is strongly influenced by the California Current System (CCS) characterized by high productivity and strong, localized wind-driven coastal upwelling, particularly in spring-summer. Underwater canyons, coastal headlands, and offshore banks as well as regional differences in winds and freshwater input are all important factors affecting these coastal upwelling processes and resulting productivity. The shelf narrows near Cape Blanco, and some of the strongest upwelling-favorable coastal winds occur from here down to Cape Mendocino in California. Identifying and avoiding productive areas like the shelf break could minimize conflicts with foraging seabirds.

ODFW recommends that BOEM avoid and/or minimize siting WEA(s) near IBAs and other productive marine areas for birds such as the shelf break.

3.1.2 Seabird use of Call Areas

ODFW is concerned about potential conflicts with a number of seabird species that use the Call Areas. The short-tailed albatross (*Phoebastria albatrus*), which is both ESA and OESA-listed as endangered. Spatial data are often not available or not representative of distribution because surveys rarely observe this rare species, so data representing other albatrosses such as black-footed albatross are used as proxy. Albatrosses and other seabird species like shearwaters, storm petrels, and fulmars use updrafts from waves to propel flight, feed in productive upwelling areas and are protected by the MBTA. Some species that breed on the Oregon Coast also utilize productive upwelling areas such as Leach's storm-petrel, Cassin's auklet, common murre and western gull. Areas with moderate or high abundance of these species should be avoided during Area Identification to minimize collision risk. Based on modeled data available on OROWindMap, siting WEA(s) near the western boundary of Call Areas or farther offshore may reduce conflict with some species. However, both Call Areas encompass areas with high predicted average abundance and/or predicted density for several of these species (Black footed albatross, Buller's shearwater, Pink-footed shearwater, Northern fulmar) indicating that siting alone will be insufficient to address potentially significant impacts on short-tailed albatross and other dynamic soaring seabird species.

ODFW recommends that BOEM and USFWS seabird experts collaborate with other subject matter experts to determine how best to delineate WEA(s) that avoid or minimize impacts on these species.

3.1.3 Seabird use inshore of Call Areas

In addition to offshore siting considerations for WEA(s), cable routes and landing sites should be analyzed to consider numerous challenges around nearshore, shoreline, and onshore habitat for seabirds and shorebirds. Based on the species present and maximum number of birds observed from 1979-2017, the relative ecological importance of seabird colonies is highest south of Coos Bay. Cape Blanco is an important area for birds, hosting some of the highest concentrations of seabirds in the California Current System (Audubon, 2013c). Cape Blanco has a high seabird diversity compared to surrounding areas, providing nesting sites for more than 72,400 seabirds of ten different species, including an area that encompasses 43% of Oregon's Common Murre breeding population (Naughton et al., 2007). In addition, many sites on Oregon's south coast such as Crook Point, Whaleshead Island, Goat Island, and Coquille Point host nesting colonies with tens of thousands of birds (Naughton et al., 2007). Note that Cape Perpetua Marine Reserve area is approximately 15 northeast of the Coos Bay Call Area and the Redfish Rocks Marine Reserve and Marine Protected Area are approximately 9 miles south of Cape Blanco and 15.5 miles northeast of the Brookings Call Area, where cable installation or any sort of development is not permitted (OAR 141-142-0020). Three OESA listed coastal bird species rely on nearshore, rocky shoreline, sandy beach, and forested habitat.

ODFW recommends that BOEM analyze potential seabird and shorebird conflicts offshore, nearshore, and onshore during Area Identification to inform delineation of WEA(s), as well as identification of cable routing and onshore transmission and facility planning.

3.1.4 Marbled Murrelet

The marbled murrelet (*Brachyramphus marmoratus*) is ESA-listed as threatened and OESA-listed as endangered. The murrelets life history strategy (e.g., long-lived, low annual reproductive potential, delayed reproductive maturity) requires high survivorship of adults, subadults, and young to yield a stable or increasing population. Murrelets have narrow habitat requirements in both terrestrial and marine systems, high breeding site fidelity, and restricted distribution (ODFW, 2021a). During the breeding season in Oregon (April through September), most murrelets prefer shallow, nearshore marine waters when at sea. Little is known about at-sea habitat use outside the breeding season but murrelets are likely more dispersed and farther from shore, having been observed up to 50 nautical miles from shore in Washington (Drew and Piatt, 2015). More information is needed about at-sea offshore distribution before impacts from OSW installations can be ruled out including bird strikes or entanglement, exhaustion due to attraction to night-lighting, reduced attentiveness to young at the nest, or other impacts to survival or fitness. At-sea murrelet distribution during the breeding season is positively associated with the amount of unfragmented nesting habitat directly inland and murrelets concentrate in nearshore areas with the most abundant and cohesive terrestrial habitat nearby. Most of the higher probability Marbled Murrelet nesting habitat currently persists on public land including state and federal forest lands along the south coast (ODFW, 2021a). Current suitable nesting habitat is limited, disconnected, and cannot be replaced in the near-term because it takes many decades or

more to develop. OSW energy projects may remove or degrade onshore habitat through construction and operation of ancillary facilities within or adjacent to forested onshore habitat. Electrical transmission lines require permanent vegetation removal within their right-of-way, which can range from 100 to 1000 ft in width, depending on the voltage of the line (ODFW, 2021a). For monitoring and management purposes, the USFWS Recovery Plan (USFWS, 1997) recognized six recovery units or "Conservation Zones", with Conservation Zone 3 and the northern portion of Conservation Zone 4 occurring in Oregon. Both zones include marine waters within 1.2 mi of the ocean shoreline and lands up to 35 mi from the coast plus any designated critical habitat units beyond that point.

ODFW recommends that BOEM consider marbled murrelet onshore and marine habitat needs and risks (from development) in the siting of WEA(s), cable routing, and onshore facilities or transmission.

3.1.5 Western Snowy Plover

The western snowy plover (*Charadrius nivosus nivosus*) is both ESA and OESA-listed as threatened. Plovers nest between March 15 and September 15 primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Occupied and suitable habitat exists along extensive stretches of sandy beach between Florence and Cape Blanco inshore from the Call Areas. Cable installation activities may be prohibited, limited or require mitigation if nesting is initiated on beaches proximal to cable landing sites.

ODFW recommends that BOEM consider beach habitats where western snowy plover nesting has occurred, or management restrictions are in place, in siting of WEA(s) to avoid the crossing of WSP nesting habitat for cable landings.

3.1.6 Northern Spotted Owl

The northern spotted owl (*Strix occidentalis caurina*) relies on late-successional forest and is state-listed as threatened. Northern spotted owls are also federally-listed and have critical habitat designated by USFWS at the Oregon coast. Loss and modification of nesting, roosting, and foraging habitat has been a leading cause of the species decline throughout much of their historic range.

ODFW recommends that BOEM analyze onshore transmission and infrastructure upgrade needs to identify where upgrades could occur that will avoid impacts to NSO habitat.

3.2 Sea turtles

Four species of sea turtles (green, Pacific leatherback, loggerhead, olive ridley) forage along the Oregon coast and are listed in Oregon as threatened or endangered by both the ESA and the OESA. According to the Call, "*Potential impacts are reduced with the 13.8 mile exclusion buffer from shore, however, potential impacts to sea turtles will be further evaluated during the planning and leasing process."* Entanglement in fishing gear, or ingesting marine debris mistaken for prey are leading worldwide threats to leatherback and loggerhead sea turtles. While incidences with these species off Oregon are uncommon, the potential for moorings and

structures to increase risks of secondary entanglement, or for OSW installations to broaden the distribution of marine debris, should be considered. Of particular concern, the Pacific leatherback sea turtle (*Dermochelys coriacea*) is listed as endangered under the ESA and OESA and is at high risk of extinction. The final rule designating critical habitat for leatherbacks off the West Coast noted that offshore energy, including wind, was one of the activities with potential to affect leatherback critical habitat and may require conservation measures. Entanglement in fishing gear is one of the primary threats to Pacific leatherbacks, and any offshore wind energy activity that could cause leatherback entanglement (e.g. in meteorological buoy mooring lines, marine debris, or lost fishing gear) would be a concern. Leatherbacks feed on jellies off the Pacific Northwest, which is a component of their critical habitat. They rely on aggregations of jellies off the West Coast to acquire energy stores to make their long migration back to their nesting beaches on the Western Pacific. Great densities of leatherback's primary prey species, brown sea nettles, occur seasonally north of Cape Blanco and a principal foraging area includes important habitat associated with Heceta Bank. Concerns with future development include coastal and offshore construction and/or vessel traffic between July and November when leatherbacks are present, as well as potential impacts to their prey base (critical habitat) and migratory corridors. According to the Call, *"Leatherback sea turtle critical habitat includes approximately 16,910 square miles (43,798 square kilometers) stretching along the California coast from Point Arena to Cape Blanco, Oregon, east of the 6,561 foot (2000 meter) depth contour. A map is available at https://bit.ly/3tFOQEm."* However, critical habitat is designated not in this area but in areas south of Point Arena CA and north of Cape Blanco OR, and this should be corrected. The Coos Bay Call Area is entirely within leatherback critical habitat and overlaps with important foraging areas near Heceta Bank.

ODFW recommends BOEM make the above correction to leatherback critical habitat. ODFW recommends that the northern portion of the Coos Bay Call Area near Heceta Bank be excluded from further consideration, and that BOEM work with NOAA to identify and exclude any other particularly productive leatherback foraging areas.

3.3 Marine mammals

3.3.1 Sea otters

Sea otters (*Enhydra lutris*) are both ESA and OESA listed as threatened. USFWS was directed to conduct a feasibility analysis on the possibility of reintroduction which, if it occurs, would likely be dependent on areas with healthy kelp beds. Kelp beds are most prominent on the south coast in nearshore areas east of the Call Areas and are associated with rocky habitat.

ODFW recommends that cable routes and landing sites be sited to avoid rocky habitat, as important sea otter habitat (also see rock habitat, above).

3.3.2 Large whale biologically important areas (BIAs) and entanglement risk

Several species of whale are both federally-listed and state-listed as threatened or endangered including blue, fin, humpback, sperm, sei, and north Pacific right whales. All gray whales are state-listed as endangered, and the Western North Pacific stock is federally endangered. The southern resident killer whale is federally endangered and not state-listed. According to the Call,

"*Potential impacts to multiple protected species and habitats are reduced with the 13.8 mile exclusion buffer from shore.... Endangered Species Act (ESA) protected species … will be further considered during the planning and leasing process*." Biologically important areas and core areas of use have been identified for several of these large whale species and are represented on OROWindMap depicting important feeding and migration areas throughout the Call Areas. Potential risks to marine mammal species that can be avoided or minimized by responsible siting should be considered during Area Identification. One such risk is mammal entanglement in fishing gear that is ensnared on OSW structures and equipment. Since 2014, the elevated number of marine mammal entanglements in fixed fishing gear has emerged as a management challenge across the entire West Coast, driven largely by interactions between humpback whales and commercial Dungeness crab gear (ODFW, 2021b; NOAA, 2022a). ODFW has been actively working to address entanglements involving Oregon's fixed gear fisheries, with increased effort since 2017 (ODFW, 2021b). ODFW has been developing a proactive management strategy to address entanglements in Dungeness crab gear and released a draft of this plan in 2021 (ODFW, 2021b). As part of this plan ODFW has implemented new regulations primarily designed to reduce the risk of future entanglements by minimizing co-occurrence between ESA-listed species and crab gear (ODFW, 2021b). In an effort to fill data gaps and better understand entanglement risk in Oregon waters the Oregon State University, in partnership with ODFW, has been studying rorqual whale distribution off Oregon to identify areas where whales and fishing co-occur. Shipboard and helicopter surveys from 2016 to 2021 document blue, fin, humpback and other whales between shore and 1500 meters depth, showing an increase in the number of whales observed compared to 2011-2012 PacSEA surveys off Oregon (Derville et al, 2022) including areas in or near both Call Areas. Survey data and whale distribution models from this study will be part of ongoing efforts to assess co-occurrence with fishing activity. Depending on local conditions, risk of entanglement may be reduced by focusing WEA designation on the western side of Call Areas or farther offshore. Mooring lines are more likely to accumulate lost fishing gear if installed closer to shore where fishing activity is higher. Additionally, WEA(s) sited closer to shore are more likely to displace fishing activity and compress conflicts from active fishing and lost gear within core marine mammal feeding areas and migratory corridors.

ODFW recommends that BOEM evaluate risks for large whales and site WEA(s) farther offshore to avoid or minimize impacts to large whales feeding in or migrating through biologically important areas (BIAs) and other areas where entanglement risk may be higher.

3.3.3 Humpback Whales

Humpback Whales (*Megaptera novaeangliae*) are ESA and OESA-listed as endangered. According to the Call, "*BOEM's current understanding of marine mammal use of Oregon coastal waters includes … humpback whales are generally concentrated in water depths up to 328 feet (100 meters)"*. However, humpback whales foraging off Oregon are more prevalent farther from shore. The final rule designating critical habitat (CH) was published by NMFS on April 21, 2021 and went into effect May 21, 2021. This final rule describes the CH for the endangered Central America and threatened Mexico distinct population segments (DPS) of humpback whales off of Oregon and the basis for the designations. For both DPSs, designated areas encompass seasonal feeding habitat containing prey that is essential to humpback conservation and that may require special management considerations or protection. As a long-

distance migratory species, humpback recovery and protection is reliant on foraging areas of biological importance, including off of Oregon, where they feed to obtaining enough energy for reproduction and completion of annual migrations over thousands of miles; the threshold for adaptability is very low. Both DPSs of humpback whales feed off the Oregon coast May through November, and both CH units 13 (50-1200 meters depth) and 14 (50-2000 meters depth) off the southern Oregon coast include areas that were found to be "high" conservation value. Areas around Heceta Bank, along the shelf break (roughly following the 200-meter isobath), and close to the Oregon-California border are important foraging areas for humpback whales that overlap with the Call Areas.

ODFW recommends BOEM exclude important humpback whale foraging areas from consideration in siting of WEA(s).

3.3.4 Southern resident killer whales

Southern resident killer whales (*Orcinus orca*) (SRKW) are ESA-listed and NOAA Fisheries has identified critical habitat. SRKW is at high risk of extinction given there are less than 75 animals left in the endangered DPS and population trends are decreasing. All three pods of the SRKW DPS may be found offshore and in coastal waters of Oregon year-round, but primarily during the winter/spring months. ODFW has partnered with NOAA to focus on key actions agencies can take to assist with species recovery including protection from harmful vessel effects and conservation of Chinook salmon prey. Three main threats to SRKW survival are vessel traffic noise and disturbance, health and contaminants, and prey availability (i.e., primarily Chinook salmon). Impacts to nearshore habitat for Chinook salmon from shoreside support activities for OSW will be an important consideration for SRKW conservation as the leasing process moves forward. The Oregon coast is an important SRKW migratory passageway between high use feeding areas. SRKW require open waterways that are free of obstruction (e.g., physical and acoustic) to safely move within and migrate between important habitat areas throughout their range, to effectively communicate, find prey, and fulfill other important life-history requirements.

ODFW recommends that BOEM work with NOAA to exclude any portion of both call areas that overlaps with habitat that NOAA deems important for SRKW recovery.

3.3.5 Gray whales

Federally endangered Western North Pacific gray whales (*Eschrichtius robustus*) number less than 300 animals and a portion of them migrate across the Pacific and along the West Coast and could potentially be vulnerable to any coastal activities. Eastern North Pacific gray whales undergo yearly migrations between low latitude wintering areas and high latitude feeding grounds, often close to the U.S. west coastline, and are protected by MMPA. Gray whales are also OESA-listed as endangered, and the most sensitive migration period is during phase b, April 1 - June 15, when nursing female-calf pairs are migrating northward past Oregon. According to the Call, "*BOEM's current understanding of marine mammal use of Oregon coastal waters includes … gray whale migratory routes are most dense within 6.9 miles from shore".* While available data indicate that migration activity is most dense close to shore, this conclusion is drawn from shore-based observational surveys from a single observation point at Yaquina Head, and so may not be representative of true distribution offshore. Migration also occurs farther from

shore and can include temporary use of estuaries to escape predation. Biologically important areas for migration overlap the eastern potions of both Call Areas. Areas important to feeding have been identified relatively close to Call Areas off Cape Blanco, Oregon and Point St. George, California. Gray whales are bottom-feeders and roll on their sides swimming slowly along the seafloor sucking sediment and benthic amphipods through coarse baleen plates (NOAA, 2013; Weller, 2010). This foraging activity may increase an individual's risk of entanglement in project equipment or ensnared fishing gear exposed on the seafloor. Site assessment activities should be performed with the expectation that whale-wise protocols will be required for at-sea vessel activity. Siting of cable routes should consider impacts of construction activities crossing the most dense migration corridor. ODFW is concerned that vessel noise from installation or cable laying may disrupt this sensitive mother-calf migration.

ODFW recommends that BOEM require developers to avoid site assessment, construction or other activities that may interfere with migration during the gray whale phase b period (Apr-Jun).

3.3.6 Blue whales

Blue whales (*Balaenoptera musculus*) are both ESA and OESA listed as endangered. Blue whales forage on euphausiids (krill) as they migrate past Oregon (National Marine Fisheries Service, 2020) between summer polar foraging grounds to winter breeding areas in Mexico and Central America (NOAA, 2022b). They likely feed off the west coast during summer when some individuals consume 6 tons of krill per day (NOAA, 2022b) making access to foraging grounds an important component of survival. Distribution is largely driven by availability and concentration of prey and may change in response to changes in prey abundance and oceanographic conditions (National Marine Fisheries Service, 2020). There is evidence that some foraging activity occurs off the southern Oregon coast. Blue whale foraging strategy involves swimming open-mouthed toward schools of krill (NOAA, 2022b). Primary threats are vessel strikes and entanglement in fishing gear (NOAA, 2022b) which may present elevated risks if OSW developments were located in areas where blue whales are accustomed to finding forage.

ODFW recommends that BOEM identify and exclude important foraging areas for blue whales during Area Identification and before WEA(s) are finalized.

3.3.7 Pinnipeds: Seals and sea lions

Pinniped species haulout to rest on rocks and beaches and have been observed at various locations along the coast. As noted in our August 18, 2021 letter to BOEM, pinniped abundance at haulout sites fluctuates seasonally or monthly as animals migrate for breeding or foraging. ODFW 2011 haulout counts for steller sea lions, California sea lions, Pacific harbor seals, and northern elephant seals are on OROWindMap. More recent data are available; ODFW is currently working on conducting and evaluating coastwide aerial surveys to update these counts, as well as creating a data layer that uses polygons to represent haulouts rather than line/point data.

ODFW recommends that BOEM exclude pinniped haulouts when identifying cable landing sites.

3.4 Fish and Invertebrates

BOEM should anticipate site assessment and site characterization activities designed to fill gaps in available information needed to inform impact analysis on fish hotspots, fish attraction, artificial reef effect, EMF from devices and mooring lines in the water column, areas important to salmonids, eulachon, sturgeon, lamprey, and cartilaginous species sensitivities, data needs about distribution, and trophic effects.

Marine invertebrates construct biogenic habitat (described above) and several shellfish species are important to recreational and commercial fisheries (described below). Many of ODFW's recommendations to avoid/minimize impacts from cable route(s) relate to sessile invertebrate disturbance, which can have negative long-term ecological effects on and around rocky habitats and through the nearshore.

4. Recreational and Commercial Fisheries

4.1 Commercial fisheries value (NOAA Fisheries PacFEM)

Improved data on commercial and recreational fishing areas are needed to both winnow down call areas to much smaller WEA(s) as well as determine impacts of site assessment activities and future development on commercial and recreational fisheries. 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*." We support this collaboration and suggest that, in addition to reducing existing space-use conflicts, BOEM work with these parties to identify historical and potential future fishing areas. When considering potential impacts of Call Areas on fisheries, the assessment of impacts should be done in such a way as to show trends over time. The recent ten-year period has been a time of tremendous change for many West Coast fisheries and significant differences in future years are anticipated. In addition, the assessment of impacts on fisheries should be categorized by fishery and gear type. The Pacific Fishing Effort Mapping (**PacFEM**) project is in progress to inform this characterization, led by NOAA Fisheries and the PSMFC 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, VMS, 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 WEA(s), cable routes and landing sites.

ODFW recommends that BOEM use PacFEM project results during Area Identification and before WEA(s) are finalized; ODFW recommends that WEA(s) should not be considered complete until PacFEM products are available and incorporated.

4.2 Dungeness crab and pink shrimp grounds

According to the Call, BOEM considered commercial fishing in the development of the Call Areas and stated that "*Substantial portions of the fishing grounds for Dungeness crab and pink shrimp, the two highest-value fisheries landed in Oregon ports, are avoided by the 13.8 mile exclusion buffer from shore*." This said, there are still significant portions of crab and shrimp grounds that remain in the call areas. Based on a review of logbook data from 1995-2020, there is significant shrimp trawl activity in the eastern portion of the Coos Bay Call Area. Similarly, Dungeness crab fishing activity is variable by year but does consistently occur in the northeastern part of the Coos Bay Call Area.

ODFW recommends that BOEM (and/or partners) conduct a full analysis of fisheries footprint and values (i.e. NCCOS and PacFEM, as described above) in the Call Areas, including crab and shrimp, during Area Identification and before WEA(s) are finalized.

4.3 Socioeconomic relationships

The economic value fisheries provide to coastal ports and communities should be part of a cumulative effects analysis or otherwise considered during BOEMs decision-making process. Socioeconomic relationships in coastal ports should be considered beyond the revenues paid directly to fishermen. Direct impacts on fishing activities also affect fishing-dependent communities, including seafood processing facilities and other marine-related businesses due to decreased fishing activity. Impacts would be felt in all of Oregon's fishing ports, not just the ports adjacent to the call areas. Members of the community dependent on fishing such as buyers and processors, fuel docks, marine supply chain, marine mechanics, restaurants, etc., could all be negatively impacted.

ODFW recommends that BOEM analyze and evaluate, as part of the planning and site characterization evaluation, the potential impacts to commercial and recreational fisheries as well as associated industries during Area Identification and before WEA(s) are finalized.

4.4 Spatial displacement

For Oregon, much of the fishing effort displaced from wind energy development would likely increase fishing effort in other areas that are already fully used by other existing fishermen, causing fishery conflicts and loss of fishing business efficiencies. The effort concentration could also cause localized depletion of fish stocks or increased bycatch. For example, due to bycatch constraints, whiting fishermen may seek out areas that are less productive for whiting but for which they will encounter less bycatch of other species. Constraints on fishing grounds may also restrict availability of grounds that also afford vessels to avoid bycatch of constraining species. Conflicts within and between various fishing sectors could also be exacerbated due to reduced operational flexibility.

ODFW recommends that BOEM analyze consequences of spatial displacement of fisheries, including effort shifts due to displacement and the effects on fishers and fishing communities distant from the Call Areas; this analysis should occur during Area Identification and before WEA(s) are finalized.

4.5 Oregon fishing vessels

According to the Call, BOEM considered commercial fishing in the development of the Call Areas and "*In the future, vessel monitoring system data and other datasets will be used to identify important fishing ground(s) for fisheries relevant to the Call Areas."* Use of VMS to map fishing effort may be effective for some portions of the fleet participating in select fisheries but fails to account for others, and completely excludes analysis of recreational fishing activity.

ODFW recommends that BOEM include all commercial and recreational fishing vessels (not just VMS data) in fishing effort analyses used during Area Identification and before WEA(s) are finalized. BOEM should complete the analyses listed in this letter and work in partnership with the fishing industry to better understand the spatial overlap of fishing activity from multiple fisheries and sectors within and around the Oregon Call Areas.

4.6 Recreational fishing

Recreational fisheries take place in waters deeper than 200 meters and could be negatively impacted by OSW development. Both private and charter fisheries are important components of Oregon fishing communities, but the data currently available are insufficient to describe recreational fishing grounds. ODFW recreational fishing data available on OROWindMap depict albacore charter fishing and recreational bottomfish. Charter fishing for albacore is evident throughout most of the Coos Bay call area and in the northern part of the Brookings call area.

ODFW recommends that BOEM engage with southern Oregon recreational fishermen to identify fishing grounds in both call areas, to reduce economic harm to the recreational fleet and communities.

4.7 Navigation and transit safety

Fishing activity and derived economic benefits may be reduced in southern Oregon ports if OSW development limits transit and fishing vessels have to travel longer distances around installations to access fishing grounds. If there are no transit lanes through the WEAs, these vessels could face increased risks of encountering inclement weather, which represents an elevated safety risk. The data currently available are insufficient to describe navigation and transit. However, ODFW understands that the United States Coast Guard (USCG) Pacific Coast Port Access Route Study (PacPARS) is currently underway and we anticipate that resulting recommendations will include transit routes and navigation lanes to address these concerns.

ODFW recommends that BOEM integrate outcomes from the USCG PacPARS during Area Identification and before WEA(s) are finalized.

4.8 Fishery stakeholder engagement

ODFW has worked with BOEM since late 2019 to sculpt an approach to stakeholder engagement designed to be inclusive and meaningful (see Data Gathering and Stakeholder Engagement Plan). However, the level of engagement that is being requested by the fishing community has not yet occurred. As described in letters to BOEM from Oregon coastal caucus legislators (May 27, 2022) and US Congressional delegates (June 22, 2022), coastal stakeholders are overwhelmingly concerned that conflicts with fisheries and natural resources are not being adequately addressed

by BOEM. For meaningful engagement to occur, engagement must provide for a two-way conversation and a common understanding of the goal, at a minimum. Achieving this may require other factors, which should be established between BOEM and the fishing community. Meaningful fishery stakeholder engagement may necessitate an extension of BOEM's timeline for area identification but could eventually benefit all parties if BOEM can successfully gather and demonstrate integration of stakeholder input into siting WEA(s) with the lowest possible impact.

ODFW recommends that BOEM conduct sector-specific fishery stakeholder engagement, that includes two-way dialog and common goals, and other factors as agreed upon with the fishing community. Engagement should include representatives from commercial, recreational, tribal and subsistence fisheries, at the regional and local levels throughout the process.

5. Scientific surveys

5.1 NOAA and IPHC stock assessments

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 NWFSC/SWFSC "Pre-recruit" groundfish survey. The dataset for 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, and disruptions of these data streams will directly impact the Council's ability to sustainably manage those fisheries, including international management. As data uncertainty increases, management becomes more precautionary if there is less confidence in the stock assessments, leading to decreased harvest potential and the economic impacts that conveys. Interference with these critical NOAA surveys should be avoided and/or minimized in collaboration with NOAA. One specific example is described in the recent report from the NWFSC to the PFMC on groundfish surveys (NWFSC, 2022).

In addition, the International Pacific Halibut Commission (IPHC) conducts stock assessment surveys from California up through Alaska waters each year, including sampling locations out to at least 275 meters water depth. These stock assessment surveys inform national and international halibut harvest caps and management and should not be impacted by OSW siting.

The impact of these stock assessment 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.

ODFW recommends that BOEM work with NOAA and IPHC to minimize impacts of siting on stock assessment surveys for both species and ecosystem management.

5.2 Ecosystem surveys

NOAA Fisheries, academic institutions, Pacific Marine Environmental Laboratory (PMEL), and non-governmental organizations conduct surveys across the California Current system. Long-term data series from these institutions are relatively rare and therefore of great value in describing this important large marine ecosystem (LME) and changes that are occurring within it. One example is the PMEL/NOAA periodic coastwide survey to document and describe climate and ocean change effects (also known as the "ocean acidification cruise").

ODFW recommends that BOEM identify long-term data series in the California Current LME and work with institutions to minimize impacts of OSW on those research activities.

In closing, the content of this letter is intended to respond to specific requests for information from BOEM in the Call for Information. These comments relate to siting OSW facilities and identify best available data and critical analysis needs to conduct responsible offshore wind development siting, that avoids or minimizes effects to ecosystem resources and fisheries activities. This letter does not comprehensively identify all of our concerns with potential impacts from OSW development on species, habitat or fisheries. We anticipate our work with BOEM will be ongoing in future stages at which time we will provide input regarding those site-specific impact concerns. ODFW will work with BOEM during Area Identification to further define areas to be avoided per our recommendations.

ODFW thanks BOEM, in advance, for consideration of these comments, as well as past and future comments.

Sincerely,

Caren Braby, Program Manager
Marine Resources Program

Cc: Curt Melcher, ODFW Director
Sarah Reif, ODFW Habitat Division Administrator

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