



Pacific Fishery Management Council

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Brad Pettinger, Chair | Merrick J. Burden, Executive Director

November 10, 2023

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

Honorable Governor Tina Kotek
900 Court Street, Suite 254
Salem, OR 97301-4047

Re: Bureau of Ocean Energy Management Request for Comments: *Draft Wind Energy Areas - Commercial Leasing for Wind Power Development on the Oregon Outer Continental Shelf (OCS)*

Dear Mr. Boren and Governor Kotek:

The Pacific Fishery Management Council (Council) appreciates the opportunity to comment on the Bureau of Ocean Energy Management's (BOEM) Draft Wind Energy Areas (WEAs) off the Oregon Coast. Within the Request for Comments, BOEM identifies nine features, activities, mitigations, or concerns within or around the Draft WEAs on which it is seeking comments. The comments provided in this letter address several of those nine topics.

The Council appreciates BOEM's collaboration with the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Coastal Ocean Science (NCCOS) to use an ocean planning model with the goal of identifying the most suitable areas for potential Draft WEAs within the Oregon Call Areas. The Draft NCCOS Report: *A Wind Energy Area Siting Analysis for the Oregon Call Areas* (Draft Report or Carlton et al., 2023) is a useful tool that has promise, but significant questions remain about operational aspects of the model's application to waters off the Oregon Coast. The Council also appreciates BOEM and NCCOS presenting information at the September Council meeting and participating in Council Advisory Body meetings, including providing a presentation to the Council's Coastal Pelagic Species Advisory Subpanel (CPSAS) online meeting August 30, and participation in a joint Groundfish Advisory Subpanel (GAP) and Marine Planning Committee meeting on September 1 to field questions.

The Council manages West Coast commercial and recreational fishing for many key California Current species. This includes responsibilities for protecting the marine ecosystem, the habitats upon which healthy fisheries depend, and the wellbeing of coastal communities. The Council's Fishery Ecosystem Plan includes a vision statement that captures these responsibilities: *The Pacific*

Fishery Management Council envisions a thriving and resilient California Current Ecosystem that continues to provide benefits to current and future generations and supports livelihoods, fishing opportunities, and cultural practices that contribute to the wellbeing of fishing communities and the nation (PFMC 2022).

In prior communications with BOEM, the Council has expressed concern that the offshore wind (OSW) planning process for Oregon has been too rushed and has failed to adequately evaluate the most suitable locations for OSW development with the least impact to fishing activities, important habitats, and the wellbeing of Oregon's coastal communities. The Council, as well as members of Oregon's U.S. Congressional Delegation and the Oregon Governor, requested a pause in the process to more fully and transparently evaluate suitable areas for OSW off Oregon. In our opinion, the pause has been insufficient to allow the robust evaluation the Council has requested. In this letter we offer detailed comments and recommendations to be considered prior to issuing final WEAs off Oregon. An Executive Summary provides an overview of Council concerns and recommendations, followed by detailed descriptions.

1. Executive Summary

The Council believes that meaningful engagement should follow a linear process where presentations and discussions occur prior to a public comment period, not simultaneously. Without adequate timing for these discussions, concerns arise over the lack of transparency around BOEM's rationale for data inclusion and exclusion in the area siting process. **The Council recommends that additional discussions between BOEM, NCCOS modelers, Council members, and the public occur** where there is a two-way dialogue on how and why decisions are made, and how public comment input can be used or has been used to find solutions to remaining identified conflicts prior to finalizing WEAs.

Offshore wind energy development has the potential to cause substantial impacts to the cultural identity, food security, wellbeing, and economy of Tribes, especially those that have federally recognized fishing rights. The Council notes that these Tribes are concerned that if these Draft WEAs are developed, the displaced fisheries could increase vessel traffic and fishing effort, thereby impacting the Tribes' fishing areas and activities. In addition, impacts to habitats and the marine ecosystem could also negatively affect tribal fishing activities. **The Council recommends BOEM continue working with the Tribes to address outstanding Tribal concerns, prior to continuing with the OSW siting process.**

The Council remains concerned about the lack of certain fishing data (particularly recreational fishing information other than albacore charter) included in any of the data layers but understands there is a lack of recreational spatial data available to be used in the suitability model framework. Given the importance of recreational fisheries to coastal communities, the Council **recommends that BOEM work with the Council and recreational sectors to address fisheries data gaps prior to finalizing the Oregon WEAs.**

A common theme throughout the Draft Report is that data/information was not included due to time constraints. One important example of data that is deficient is the socioeconomic data for commercial and recreational fisheries, coastal communities, and ports. Currently the economic data that is included uses only cumulative value measures paid directly to fisheries participants.

The Pacific Fishing Effort Mapping (PacFEM) tool is currently being developed to evaluate more comprehensive regional and local economic impacts. **The Council recommends that additional time be provided to improve the suitability modeling effort by including data/information such as that from the PacFEM project.**

The Council is supportive of evaluating areas outside the current Call Areas that may be suitable for OSW development and may have fewer impacts to fishing, habitat, and coastal communities. Currently, only historical fishing grounds are used for the suitability modeling. Given the change in the California Current from climate change-related oceanographic processes and change in management measures (e.g., modifications to the configuration of areas open or closed to commercial fishing), future shifts in fishing effort should be considered when evaluating suitability for OSW siting. **The Council recommends that BOEM extend the geographic scope of the NCCOS suitability model coastwide off Oregon to determine suitable areas for OSW development outside the Call Areas.**

The Council remains concerned that the National Marine Fisheries Service's (NMFS) recommendation for using the presence and Critical Habitat of Endangered Species Act (ESA)-listed species as a constraint layer in the suitability model was not selected by BOEM, while the Department of Defense and U.S. Coast Guard recommendations were included as constraints.

The Council is also concerned that the levelized cost of energy values are out of date, and **the Council recommends that BOEM update the levelized cost of energy, as the current values may no longer be valid.**

Juvenile and larval fish distribution provided by NMFS were not included in the suitability model. These data and other ecosystem-based data layers should be included in the NCCOS suitability model for future OSW siting. **The Council recommends that BOEM include a careful analysis of ecosystem impacts, such as wind wake effects on ocean processes, and should identify sensitive areas such as larval nursery areas that may be impacted by OSW siting.**

The Council remains very concerned about potential disruptions to important scientific surveys that provide data vital to fisheries management and ecosystem protection actions. In June 2022, NMFS [responded](#) to BOEM's *Call for Information — Commercial Leasing for Wind Energy Development on the Outer Continental Shelf (OCS) Offshore Oregon*, expressing concern about the impacts to scientific surveys. The Council is concerned that these NMFS surveys in or near the Draft WEAs could be negatively impacted, which could then impact stock assessments and other scientific products used to inform management decisions, especially in the context of multiple lease sales along the West Coast.

Based on the concerns described above, the Council strongly recommends that BOEM not take any further actions on OSW energy planning off Oregon until these concerns, described in the September 2023 Marine Planning Committee (MPC) Report (Agenda Item H.3.a, Supplemental MPC Report 2, September 2023¹) are addressed and included in the process, as appropriate.

¹ See - <https://www.pcouncil.org/documents/2023/09/h-3-a-supplemental-mpc-report-2/>

However, if BOEM chooses to move forward with the OSW planning process before adequately addressing the concerns outlined here, we offer additional recommendations contained in this letter.

Impacts to Fisheries (See Section 2.1)

The Council recognizes and appreciates BOEM's efforts to minimize impacts to fishing activities in the Call Areas. Contributions and recommendations from NCCOS, NMFS, and the Oregon Department of Fish and Wildlife (ODFW) have helped guide the location of the Draft WEAs. After careful consideration of the Draft WEAs and available fisheries data, the Council concludes there are areas integral to fishing activities within the Draft WEAs that should be removed prior to issuing final WEAs.

The groundfish fishery includes dozens of rockfish species, several flatfish (flounders and soles), and roundfish species (such as sablefish and hake) and is the primary year-round economic driver for most Oregon ports. It also includes both recreational and commercial sectors. While most recreational effort takes place shoreward of the Draft WEAs, a lack of robust recreational data is concerning and should be quantified before WEAs are finalized.

Commercial groundfish fishermen use a variety of gear types and operate in very distinct areas based on their target species and, in some cases, species they must avoid (e.g., salmon). Thus, the Council considers each primary groundfish sector and proposes areas to be removed that would afford the best retention of fishing opportunity while leaving larger areas intact. Most groundfish fishing occurs in areas shallower than 400 fathoms (731.5 meters); removing those areas would allow retention of most groundfish fishing effort. Additionally, removing specific areas will provide mobile gear fleets, such as trawlers, the ability to move and navigate around the WEAs while fishing in adjacent fishing grounds, provide "travel-through" or transit channels where fishermen can set their gear (mobile gear or fixed gear), retrieve their gear and exit the WEA in a continuous fashion, and provide for greater safety when multiple vessels are operating in the same area near a WEA.

The Highly Migratory Species (HMS) fishery includes commercial and recreational fisheries for albacore tuna that are important economic drivers for HMS participants and for Oregon's coastal communities. The Council is recommending removal of areas in both Draft WEAs based generally on ranked importance levels of 50 percent or greater. While areas recommended for removal in Draft WEA B show a lower ranked importance, those areas are very important to commercial and recreational fishermen based in Southern Oregon and Northern California, and likely to become more so as activities associated with leases in the Humboldt lease sites begin. Deep-set buoy gear (targeting swordfish, which is part of the HMS fishery) was recently authorized for use as a gear type off Oregon. Many oceanic features in both Draft WEAs lead experienced commercial fishermen to believe those areas could be prime swordfish grounds as the fishery expands to Oregon. Since that fishery has no historic footprint off Oregon, it received no consideration during the NCCOS modeling process.

The Coastal Pelagic Species (CPS) fishery is active in Oregon and is a very valuable economic contributor especially during periods of high Pacific sardine and market squid presence. The CPS fishery typically operates shoreward of the Draft WEAs and thus does not have an active presence

in the Draft WEAs. However, the Council is concerned about the potential impacts to spawning activities and the larval life cycle of the Pacific sardine, and the exclusion of larval distribution data from the NCCOS model. This information can be provided by NMFS from survey activities conducted in or near the two Draft WEAs.

Current recreational and commercial salmon fishing effort does not seem to be directly impacted by the Draft WEAs, but BOEM should recognize that may change in the future. Recreational fishing data is also sparse and should be addressed before final WEAs or lease areas are proposed. Understanding salmon species' movements throughout the draft WEAs is also important to fisheries such as the trawl fisheries, particularly the midwater hake (Pacific whiting) trawl sectors, because salmon is caught incidentally in these fisheries. Trawlers must abide by strict rules to avoid them. Full OSW development in the WEAs could interrupt salmon migratory patterns and cause unintended consequences for other fisheries.

Based on Council concerns about impacts to these fisheries, we recommend that BOEM consider removing specific areas from the Draft WEAs. Figure 2 and Figure 1 below display the composite ranked importance data layers for several fisheries in Draft WEA A (Coos Bay) and Draft WEA B (Brookings), respectively. Figure 4 and Figure 3 display the BOEM aliquots in Draft WEAs A and B respectively, that should be considered for removal, based on the importance to specific commercial or recreational fisheries or sectors. Detailed explanations and a list of aliquot numbers are found in the Fisheries section below. The Council is willing to assist BOEM in further refining the Draft WEAs.

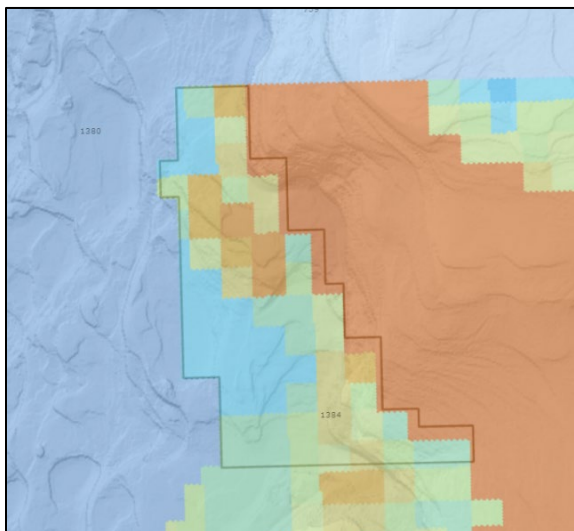


Figure 2: Draft WEA A (Coos Bay) and composite ranked importance. Red/orange = less suitable for OSW; blue/green = more suitable for OSW (source: OROWindMap)

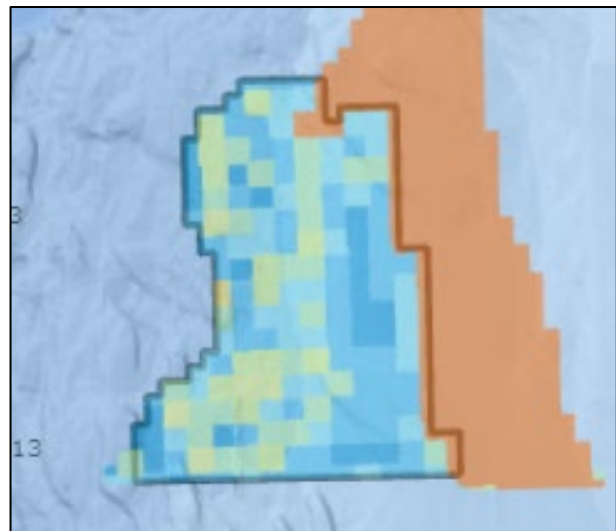


Figure 1: Draft WEA B (Brookings) and composite ranked importance. Red/orange = less suitable for OSW; blue/green = more suitable for OSW (source: OROWindMap)

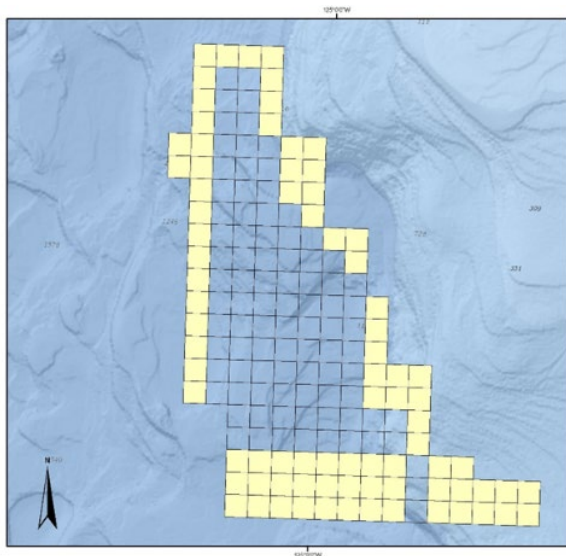


Figure 4: Draft WEA A (Coos Bay) aliquots recommended for potential removal to minimize impacts to fishing activities.

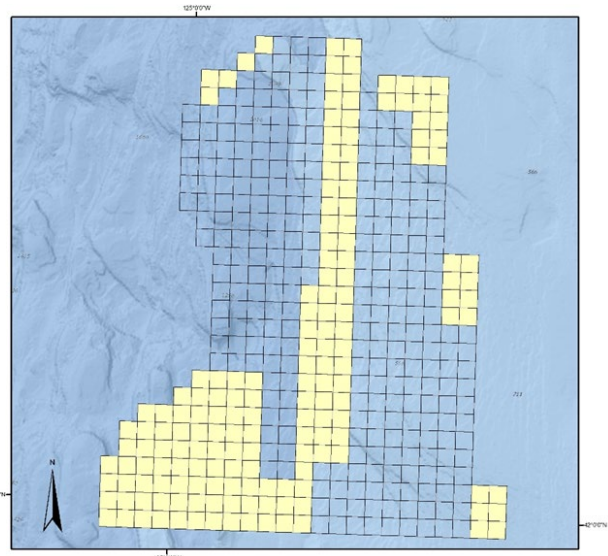


Figure 3: Draft WEA B (Brookings) aliquots recommended for potential removal to minimize impacts to fishing activities.

Impacts to Habitats and the Marine Ecosystem (See Section 2.2)

The Magnuson–Stevens Fishery Conservation and Management Act (MSA) requires the Council to describe, identify, conserve, and enhance essential fish habitat (EFH) for Council-managed species. The MSA also requires the Council to consider identifying Habitat Areas of Particular Concern (HAPC) that require additional consideration, as well as actions that could have adverse effects on EFH. EFH for Council managed fisheries, along with several EFH Conservation Areas (EFHCAs) and important habitat features have been identified within the Draft WEAs. The Council is recommending avoiding these habitats by removing specific aliquots from the draft WEAs, as well as implementing a minimum 500 m buffer around important habitat features.

Significant sensitive habitat resources occur in both Draft WEAs A and B (Figure 6 and Figure 5, respectively), and/or in the surrounding areas. These habitat resources include:

- All hard substrate areas (rocky reef HAPC) identified in surficial geologic habitat (SGH) v.4 (Goldfinger et al. 2014), including nearshore and shoreline rocky habitat;
- All hard substrate areas (rocky reef HAPC) identified by Merle et al. (2021);
- Observed deep-water coral and biogenic habitats at NOAA research sites;
- “High robust” habitat suitability areas for coral taxa associated with hard substrate;
- Methane seeps bubble plume w/observed faunal communities and ongoing research;
- All methane seep bubble plume sites;
- Hard substrate areas (including carbonate clasts) mapped/characterized by Cochrane et al. (2017);
- Areas with canopy kelp (HAPC); and
- EFHCAs: Stonewall Bank, Heceta Bank, Deepwater off Coos Bay, Arago Reef, Bandon High Spot, Rogue Canyon, Rogue River Reef, and the Brush Patch

Within the Draft WEAs, the Council recommends avoiding areas with sensitive benthic habitat resources by removing aliquots that have substantial overlap with these resources and implementing a minimum 500 m buffer around the resources to prevent disturbance or damage from site assessment, installation, operations activities associated with wind projects and cable routes.

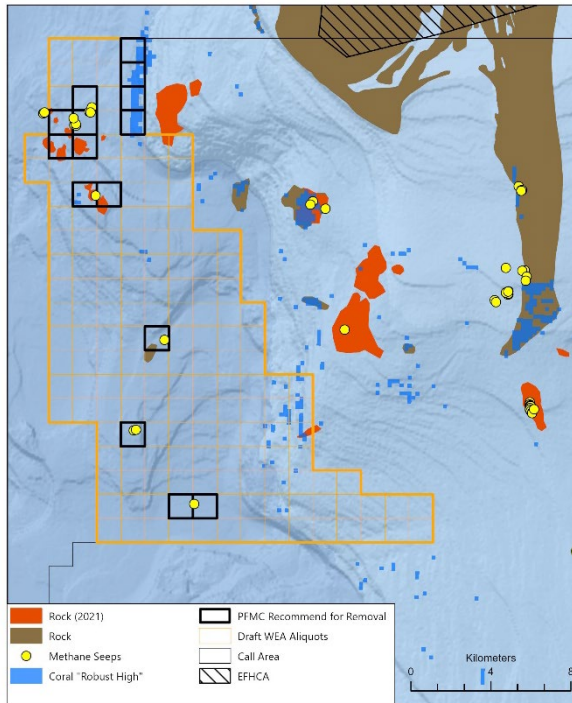


Figure 6: Sensitive habitats within Draft WEA A (Coos Bay), and aliquots proposed for removal (bold outline).

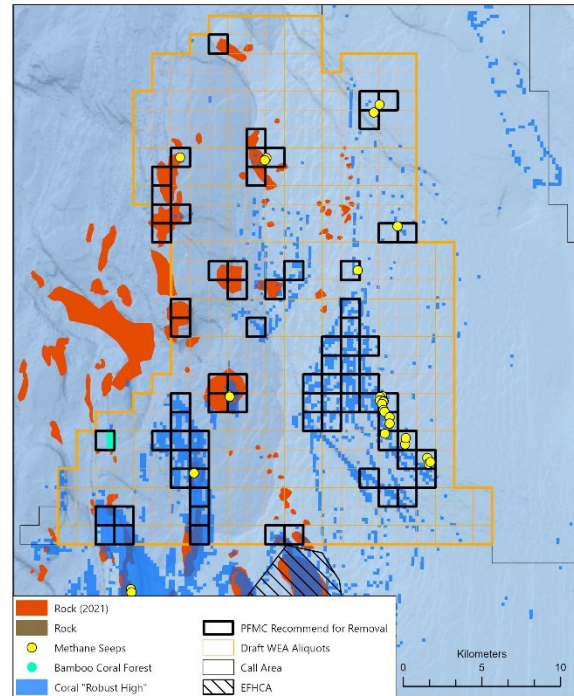


Figure 5: Sensitive habitats within Draft WEA B (Brookings), and aliquots proposed for removal (bold outline).

In areas outside the Draft WEAs, the Council recommends implementing a minimum 500 m buffer around sensitive habitat resources to prevent disturbance or damage from site assessment, installation and operations activities associated with cable routes.

In addition to the habitats listed above, there are notable features outside the Draft WEAs that could be impacted by cable routes. Specifically, there is substantial rock south of Heceta Bank not previously delineated though it is discernable in high-resolution backscatter data. Also, there is a large mud volcano southeast of Draft WEA A covered with carbonate rock and a unique faunal assemblage.

The Council also identifies the need for additional data or processing to inform WEA siting and cable routes, and makes the following recommendations:

- Use recent (2016-2023) high-resolution seafloor mapping data to identify sensitive habitats throughout the WEAs and at possible cable routes, not previously delineated in SGH v.4 (Section 2.2: Habitat and Ecosystem Concerns and Recommendations below).

- **Conduct high resolution seafloor mapping where data gaps remain shoreward of 200 m depth to identify sensitive habitats, including fish nursery habitats, prior to determining cable routes. (See Section 2.2: Habitat and Ecosystem Concerns and Recommendations).**
- **Initiate efforts to model the effects of wind tower arrays (‘wind wake’ effects) on local wind forces to understand the potential long-term effects on ocean productivity. This is especially relevant to the Heceta Bank rocky reef complex and adjacent shelf break. If such modeling indicates a likelihood of effects on Heceta Bank, then the Council recommends removing aliquots that are within range of contributing to those effects.**

2. Detailed Description of Concerns and Recommendations

Process resulting in the Draft WEAs and prior Council input

The Council has previously commented during the BOEM planning process offshore Oregon. On June 28, 2022, the Council provided comments on BOEM’s Request for Information and Nominations: Commercial Leasing for Wind Energy Development on the Outer Continental Shelf Offshore Oregon (Call Letter).² On April 6, 2023, the Council submitted a letter to BOEM and Oregon Governor Tina Kotek expressing “*concerns about the development of offshore wind (OSW) energy in ocean waters off the Oregon Coast*”³ and requesting that the Call Areas be rescinded so BOEM could “*restart the process of identifying Call Areas off Oregon by considering all areas greater than 12 miles offshore, including areas deeper than 1,300 meters.*” Those concerns remain, as evidenced by the Council’s discussion during the September 2023 meeting. On April 12, 2023, the Council submitted a letter to BOEM with some specific recommendations for improving the spatial suitability modeling and strengthening the OSW planning process.⁴ While some of the recommendations were addressed, others remain unfulfilled.

Related to prior Council correspondence, we reference two other letters. On June 9, 2023, the two Oregon U.S. Senators, two Congressional Representatives, and Oregon Governor Tina Kotek sent a [letter](#) to BOEM Director Elizabeth Klein, requesting a pause in the process to provide additional time “to consult with Tribal governments, engage stakeholders in coastal communities, and assist BOEM in identifying, understanding, and responding to local concerns.” And on August 8, 2023, the two Senators and two Representatives sent a [letter](#) to Director Klein encouraging BOEM to ensure meaningful engagement with stakeholders, and requesting a 60-day comment period for the draft Oregon WEAs, rather than the 30 or 45-day comment periods for Draft WEAs in other parts of the country.

The Council strongly recommends that BOEM not take any further actions on OSW energy planning off Oregon until the concerns described in Agenda Item H.3.a, [Supplemental MPC Report 2 September 2023](#)⁵ are addressed and included in the process. These concerns are largely identical to those expressed in our April 12, 2023, letter. In support of BOEM’s stated goal

² See - <https://www.pcouncil.org/documents/2022/06/june-2022-letter-to-boem-on-oregon-call-areas.pdf/>

³ See - <https://www.pcouncil.org/documents/2023/04/april-2023-boem-offshore-wind-gov-kotek.pdf/>

⁴ See - <https://www.pcouncil.org/documents/2023/04/april-2023-letter-to-boem-on-offshore-wind-process-recommendations.pdf/>

⁵ See - <https://www.pcouncil.org/documents/2023/09/h-3-a-supplemental-mpc-report-2/>

of developing a clean energy future that benefits communities and co-exists with other ocean users, BOEM should take additional time to ensure better-informed decisions that would allow OSW off Oregon to be developed in a way that minimizes impacts to fishing, coastal communities, habitats, and the ecosystem. This request reiterates previous requests for a pause in the process, from the Council and other entities. In addition to the overarching request to pause the process, we offer several comments in response to BOEM's request for comments on the Draft Oregon WEAs.

Summary of Council Concerns

This section summarizes the Council's overarching concerns. The detailed comments provided should be read in recognition of the major concerns expressed about the lack of time to absorb and understand the information presented. Much of the concern described here was more fully described in the Supplemental MPC Report referenced above. But again, the time for MPC discussion and preparation of that report was also very compressed. Additional detailed comments, including identification of aliquots for removal, were compiled by the MPC Committee members, working with members of their respective advisory bodies, and the Habitat Committee. It was clear from the discussion of Council advisory bodies that the data, results, and methods of the suitability analysis and other factors taken into account by BOEM in identifying the draft WEAs are not well understood. The limited time and explanation are major reasons why the Council remains concerned about opportunities for meaningful engagement and transparency with West Coast fishing communities to date.

Data Layer Concerns

The Council remains concerned about opportunities for meaningful engagement and transparency with West Coast fishing communities. The Draft Report states: "over 400 data layers were acquired during data inventory."⁶ Appendix A of the Draft Report provides a list of data utilized for this spatial planning analysis and lists a total of 40 datasets. Of these, links are provided for 10 datasets, 23 reference unpublished datasets, and the remaining seven are available upon request. Questions remain about the quantity, quality, and thoroughness of the data used in the model. The Council is also concerned about some of the assumptions and methodologies utilized in the model and either not included in the report and/or not explained during the meetings. The Council recommend that BOEM provide the decision framework that was used behind data and model input selections to increase transparency regarding the selection of data included in the model or considered. By advocating for additional transparency, **the Council recommends that additional discussions between BOEM, NCCOS modelers, Council members, and the public occur where there is a two-way dialogue on how and why decisions are made, and how public comment input can be used or has been used to find solutions to remaining identified conflicts.**

The Council appreciates BOEM and NCCOS including the fisheries datasets provided by ODFW and NMFS in developing a combined fisheries data layer.⁷ The nine fisheries identified for the model included groundfish bottom trawl, at-sea hake mid-water trawl, shoreside hake mid-water trawl, pink shrimp trawl, groundfish fixed gear pot, groundfish longline, commercial albacore, charter albacore, and Dungeness crab pot fisheries. The Council remains concerned about the lack

⁶ Draft Report, Section 2.3.2., pages 18 & 19

⁷ Draft Report, Appendix E, pages 153 - 166

of recreational fishing data other than albacore charter included in any of the data layers but understands there is a lack of recreational spatial data, and the commercial data may also cover or overlap many of the recreational fishing grounds. Additionally, ODFW and NMFS had only a limited amount of time to pull the information together. Recreational fishermen noted the Brookings Draft WEA (Draft WEA B) could potentially create problems for private sport albacore fishing, deep-water halibut and groundfish bottom fishing because it creates a navigational challenge.

The Council recommends that BOEM work with the Council and recreational fisheries sectors to address fisheries data gaps to identify areas of potential conflict that occur within the proposed draft WEAs.

The socioeconomic data layer for commercial and recreational fisheries, dependent fishing communities, and ports is deficient: the economic measure used in the fisheries data layer is based solely on ex-vessel revenues, which does not provide a full depiction of sport and commercial fishing's economic impacts to coastal communities and ports. Socioeconomic relationships in coastal ports should be considered beyond the revenues paid directly to fishermen. The Pacific Fishing Effort Mapping (PacFEM) project⁸ considers these socioeconomic relationships for all West Coast fisheries and ports and should be incorporated into subsequent runs of the NCCOS spatial suitability model to inform decisions on Final WEAs, to reflect the full socioeconomic value of those areas. **The Council recommends that BOEM not finalize draft WEAs or cable routes until an economic analysis using the PacFEM tool is conducted to identify potential impacts to U.S. West Coast ports from the proposed WEAs.**

Similar to the approach of compiling fisheries data, BOEM should include a careful analysis of ecosystem impacts and should identify sensitive areas such as larval nursery areas that may be impacted by OSW development. While BOEM has concentrated on direct impacts to fishing (and loss of operational fishing flexibility due to gear types), the Draft Report lacks the modeling necessary to show the potential decrease in fishing ground flexibility to fishermen based on the wind energy itself. The Draft WEAs and other areas being considered for development are frequently also the prime areas for the densest fish populations due, in part, to upwelling. Wind is essential to marine productivity. Accessing and/or removing the wind energy in the best areas could lead to lower fish abundance, which is something that should be modeled and incorporated into decision making.

The Council recommends BOEM conduct an analysis on the potential cumulative impacts of OSW siting on larval dispersal and ocean productivity through reduced or altered wind energy.

Tribal concerns

Offshore wind has the potential to cause real-world impacts to the cultural identity, food security, well-being, and economy of those Tribes of this Council that have federally recognized fishing rights. The Council notes that these Tribes are concerned that if these Call Areas are developed, the displaced fisheries could increase vessel traffic and fishing effort, thereby impacting the

⁸ This project is a collaborative state-federal project underway by PSMFC, led by NMFS and funded in part by BOEM.

Tribes' fishing areas and activities. In addition, areas developed for OSW could alter ocean ecosystem dynamics, resulting in unknown ecosystem outcomes and potential impacts to tribal treaty protected resources. Many of these Tribal resources originate in, or migrate from, areas off California and Oregon. Lastly, Tribes signed treaties with the United States Government, which the U.S. Supreme Court has upheld as the supreme law of the land, and the Biden-Harris administration has made commitments to uphold these rights. The Department of the Interior and BOEM have specific obligations, both as a party to the various treaties and as trustee of treaty-reserved resources, to ensure that the United States honors its commitments in those treaties in all aspects of its work, including OSW.

Modeling concerns

The NCCOS modeling efforts considered only areas within boundaries of the Call Areas. The spatial suitability effort should be applied to all U.S. waters off Oregon to determine if there are more suitable areas outside the Call Areas. The Council has made this request previously. As shown in the Draft Report, the wind resources and potential are similar in most of the waters off Oregon. Spatial and temporal variability should also be considered when modeling to identify potential impacts. Currently a historical perspective is used to identify impacts, but the within year (seasonal) and between year impacts are not considered independently for comparison to this average. Given that the past ten years has been a time of change in the California Current (e.g., marine heat waves, ocean acidification and hypoxia) and a time of fisheries management changes (e.g., changes to the non-trawl Rockfish Conservation Area (RCA)), temporal and spatial shifts should be considered to better anticipate potential future impacts.

The Council recommends that BOEM use the NCCOS spatial suitability model to all U.S. waters off Oregon to determine if there are more suitable areas outside the Call Areas. In addition, temporal analyses should be conducted to identify the spatial changes in fishing grounds over time when evaluating spatial suitability.

Rushed modeling

The inability to provide additional data/information due to time constraints is a common theme in the Draft Report, and thus precluded adequate evaluation of several important issues. The Draft Report includes many references in which time and/or incomplete information was identified as a limiting factor, including:

- Adequate evaluation of other fisheries and other fish species (pages 24, 122, & 154)
- Coastal and Marine Ecological Classification Standard (CMECS) substrate attributes (page 134)
- Mesoscale eddies data layers (pages 135 & 137)
- Future shifts in habitat and species distribution (page 135), and
- Other oceanographic features such as preferred temperature, depth, chlorophyll, and prey distribution (page 137).

In addition, we note that juvenile and larval fish distribution data provided by NMFS are not included as a data layer in the model. While the Draft Report does include juvenile and larval fish distribution data in Appendix F, the Council would have benefited from having a better opportunity to consider the potential role of the data in the development of Draft WEAs. The draft Coos Bay WEA (WEA A) is a Dover sole spawning area (see section on Groundfish bottom trawl). NOAA

survey reports have shown it also is a forage and/or spawning area for Pacific sardine, with larval transport taking place through the Call Area to reside their first year in the Umpqua River estuary. Allowing additional time to gather and incorporate the information outlined above, as well as allowing adequate time for proper inclusion of data that, according to the Draft Report, was not fully utilized due to time constraints, would provide additional confidence in the model's outputs. **The Council recommends BOEM include additional data layers that were excluded due to time constraints into the NCCOS suitability model for future OSW siting processes.**

Limited incompatibility (constraint) layers

The Department of Defense Exclusion Area, which covers more than half of the Coos Bay Call area, and the U.S. Coast Guard Pacific Coast Port Access Route Study (PAC-PARS) fairways were the only activities deemed completely incompatible with OSW and thus considered constraints in the NCCOS model. The Council expresses concern that the presence and Critical Habitat of ESA-listed species such as leatherback sea turtles (LST) and the Southern Resident Killer Whale (SRKW) is not afforded similar consideration as a constraint. While BOEM has noted that they did consider the ESA-listed species and acknowledged that ESA consultations will be required to evaluate jeopardy and adverse modification to critical habitat, members of the Council's MPC believe the status of these populations warrant consideration of being scored as constraints in the model. The Pacific Leatherback Conservation Area closed large swaths of the ocean to specific gear types during times when it was expected LSTs would be foraging off the coast. That fisheries are subject to such constraints, while OSW development is not, represents a troubling philosophical dichotomy. Similarly, concern was also expressed about the failure to include the ESA-listed short-tailed albatross in the bird data layer- another species which could have profound impacts on our fisheries should there be an interaction.

Levelized cost of energy

The Wind Submodel in the Draft Report uses the Levelized Cost of Energy for 2027 (LCOE). This was based on a 2021 report prepared by the National Renewable Energy Laboratory (NREL). Although we forgo detailed comments here, the Council questions whether the values provided (\$/MWh) are still valid, given recent events on the East Coast, where developers are asking for changes or increases in power purchase agreements by as much as 54 percent.⁹ **The Council recommends that BOEM update the levelized cost of energy, as the current values may no longer be valid.**

Potential impacts to NOAA scientific surveys

The Council remains concerned about potential disruptions to these important surveys. In June 2022, NMFS responded to BOEM's Call for Information — Commercial Leasing for Wind Energy Development on the Outer Continental Shelf (OCS) Offshore Oregon.¹⁰ Included within that document is a graphical depiction of NMFS Scientific Surveys Conducted within the Brookings Call Area and Vicinity.¹¹ The Groundfish Bottom Trawl Survey collects samples in both Draft WEAs. In the southern portion of Draft WEA B in Brookings, there are NMFS Sampling Stations

⁹ <https://www.msn.com/en-us/money/markets/equinor-bp-seek-54-hike-in-us-offshore-wind-power-price-filings-show/ar-AA1g5g8P> (Reuters)

¹⁰ See - <https://www.regulations.gov/comment/BOEM-2022-0009-0178>

¹¹ See Figure 27, page 48 of the NMFS June 28, 2022, comment letter

for the Pre-recruit Survey, West Coast Pelagic Fish Survey, Northern California Current Ecosystem Survey, and Integrated Ecosystem and Pacific Hake Survey (see Figure 3.25, page 69, and Appendix D of the Draft Report). The Pacific hake survey is particularly important to inform international management of fisheries resources. Questions remain about the potential uncertainty that could result in stock assessments, and other scientific products used, to inform management from changes to these NMFS surveys in the Draft WEAs, if a full build-out of OSW energy was completed in the Draft WEAs. Similarly, additional questions arise when trying to understand the potential uncertainty resulting when the five California lease areas are fully built out. The Council is concerned that in the siting process, there hasn't been a wider ecosystem-wide approach, including potential impacts to NMFS surveys, taken to consider this issue in the context of California's 25 GW goal and the three GW that BOEM is seeking off the Oregon Coast, related to Oregon's renewable energy goals. **The Council recommends adopting recommendations from NMFS, including evaluation of the cumulative effects and resulting uncertainties arising from development of the California OSW leases and any future Oregon OSW leases.**

Navigational concerns

Navigational channels and "travel-through"/transit areas should be considered. As the Council's Groundfish Management Team stated in its March 2021 [Agenda Item C.2.c, Supplemental GMT Report 1](#), "Closure of areas used to access fishing ground could result in detours that cost [the fishing] industry time, fuel and money." Both Draft WEAs present potential navigation and safety issues, especially when coupled with adverse weather conditions and the needs of fishery participants to modify their transit routes due to the presence of OSW facilities, to avoid protected species interactions, or to navigate between fishing areas separated by an OSW facility. For example, the Coos Bay Draft WEA A could present navigation and safety issues, especially for vessels fishing Heceta Bank and then transiting farther offshore. The Council has commented previously regarding our concerns for safe navigation and **recommends that BOEM ensure adequate transit lanes to promote safety and to minimize impacts to commercial and recreational fishing participants.**

Cumulative impacts and adequate evaluation of optimal OSW energy siting

As stated in the Council's letter to Oregon Governor Kotek, the Council remains concerned that the NCCOS modeling efforts considered only areas within boundaries of the Call Areas. No modeling was completed to help determine if there are more suitable areas outside the Oregon Call Areas, despite multiple requests to do so. As shown in the Draft Report, the wind potential is similar across large areas of the Oregon Coast. The Council previously recommended a coast-wide, long-term evaluation of the potential impacts to fisheries, habitats, the ecosystem, and coastal communities. While a cumulative impacts assessment is required under the National Environmental Policy Act (NEPA), we believe a proper evaluation, including a comparison of a variety of alternatives, should occur before any further OSW planning takes place for the West Coast. Because of the narrow modeling focus, there is a lack of confidence that BOEM did an adequate job in identifying Call Areas and Draft WEAs with the lowest possible impacts to fishing communities. The intent of NEPA and related laws is to ensure that the public has the same information as the decision makers and understands the trade-offs considered before decisions are made). Concerns remain about the piecemeal approach BOEM is taking in siting of WEAs and narrow focus on cumulative impacts of OSW on the marine environment and fisheries. For instance, the southern end of Draft WEA B, within the Brookings Call Area, is less than 50 nautical

miles from the two lease sites off Humboldt in California. We understand that BOEM's process involves conducting more thorough analysis before the Construction and Operations phase. However, such fundamental analyses should come during the planning phases before key area identification decisions are made.

2.1 Fishery-Specific Concerns and Recommendations

In addition to the overarching request to pause the process until the above Council concerns are met, the Council provides the following comments and recommendations in response to BOEM's request in Section 9 of the public notice. These comments and recommendations are focused on areas that are integral for fishing activities managed by the Council. **The Council recommends that BOEM remove the specific areas described below and collated in Figure 17 and Figure 18, given the economic and social importance of both commercial and recreational fisheries across all sectors to the state of Oregon and the U.S. West Coast.** These recommendations are based on the ODFW/NMFS ranked suitability maps in the Draft Report and housed in the [OROWindMap tool](#), other maps as indicated, and input from subject matter experts in the fishing sectors described below.

Highly migratory species

Determining the suitability of specific areas, in relation to future fishing activities, is based on historic fishing data. This is a significant shortcoming of the NCCOS model in that potential future fisheries, or newly available species due to distribution shifts, are not considered. Deep-Set Buoy Gear is a newly authorized gear type used to harvest swordfish and other marketable highly migratory species off the West Coast. As Pacific Bluefin tuna continue their remarkable recovery from an overfished state, commercial and recreational fishermen are encountering them north of their historic range, including as far north as off the Washington coast. Given the leases off California have an initial term of 39 years, it is reasonably foreseeable the two Draft WEAs would have some importance to both of those fisheries.

The commercial albacore fishery typically ranks fourth or fifth for total annual revenues generated in Oregon marine fisheries. Between 1992 and 2022 commercial landings in Oregon have averaged 7.6 million pounds per year.¹² Between 2012 and 2022 an average of 329 commercial vessels landed albacore in Oregon.¹³ In 2022, a total of \$14,250,000 was paid to those vessels.¹⁴ This does not account for any downstream economic impacts and benefits to Oregon's fishing communities.

ODFW's Ocean Recreational Boat Survey (ORBS) deploys samplers to monitor Oregon's sport fisheries and provide estimates of overall effort and catch. There were an estimated 29 charter trips and 1,476 private recreational trips over the 2022 season. An estimated total of 21,823 albacore were caught in the recreational fishery.¹⁵

¹² Commercial and Recreational Harvest of Albacore in Oregon: Annual Albacore (*Thunnus alalunga*) Sampling Report, 2022. ODFW Marine Resources Program. 20pp. See - [2022 Annual OR Albacore Report.pdf \(state.or.us\)](#)

¹³ Id @ 5 (Table 4 - Total number of unique vessels landing albacore in Oregon, 2012-2022)

¹⁴ Id @ 10 (Table 11 - Total revenue (ex-vessel) and average price of Oregon albacore landings, 2012-2022)

¹⁵ Id @ 15.

Albacore fisheries are opportunistic but typically dependent on habitat features including seamounts, offshore banks, and deep-water canyons which tend to be highly productive areas associated with forage accumulation. As such, fishing grounds important to those fisheries tend to be similar year-to-year.

The Draft Report includes effort and revenue values for the commercial albacore fishery and effort data for the charter fleet. The Council remains concerned about the lack of information about recreational fisheries, in particular the albacore fishery. **The Council recommends BOEM conduct targeted outreach with representatives of the recreational albacore fishery to fill that data gap to better inform potential final WEAs.**

Areas still remain within both Draft WEAs that are important to the commercial and charter vessel albacore fisheries. The combined fisheries data layer had the effect of diluting the dependence of the albacore fleet(s) on those areas.

While some areas within the Brookings Draft WEA may appear to be of lower importance (i.e., having a ranked importance less than 0.5) to Oregon’s albacore fisheries, these areas are highly important to commercial and recreational fisheries based in southern Oregon and northern California. Those areas should be considered for removal.

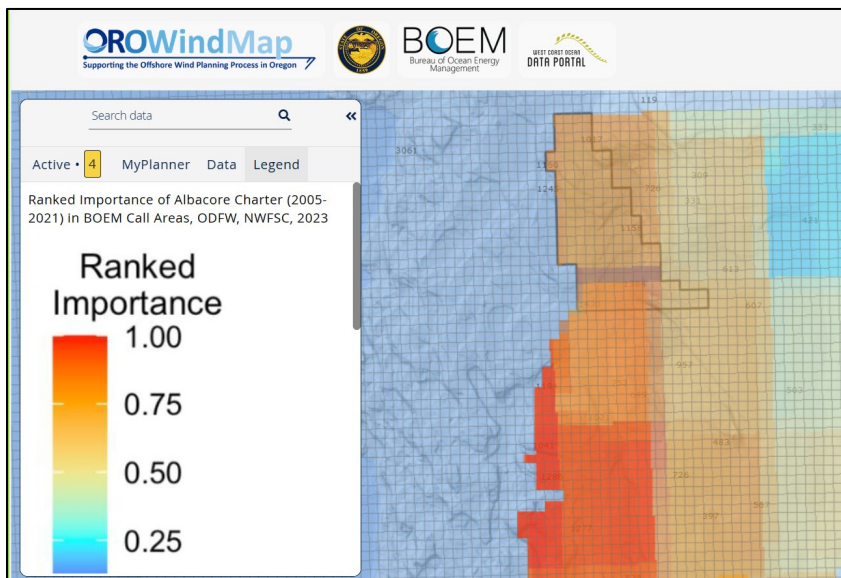


Figure 7: Ranked importance of albacore charter fishing in the area of the Coos Bay WEA (Draft WEA A).

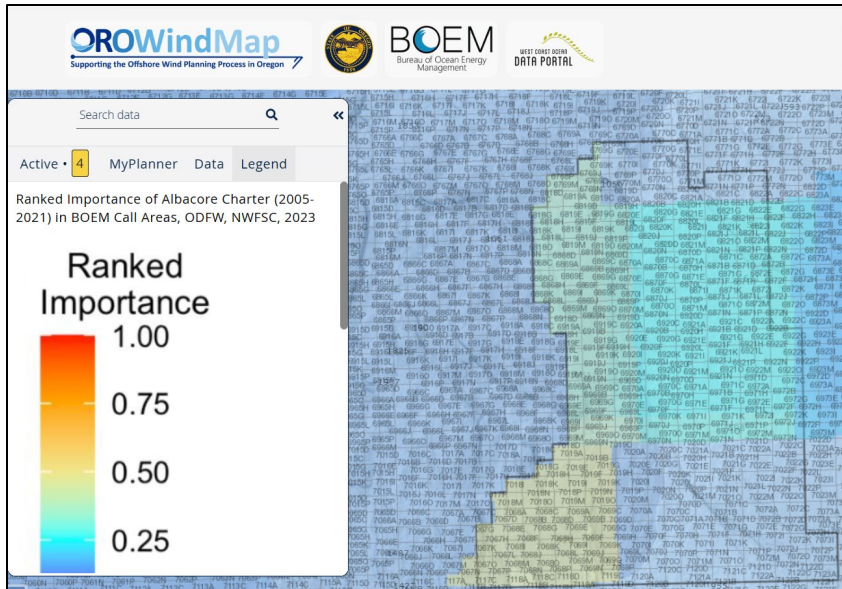


Figure 8: Ranked importance of albacore charter fishing in the area of the Brookings Draft WEA.

Salmon fisheries

While information readily available in OROWindMap does not indicate a prevalence of recreational or commercial salmon fishing within the Draft WEAs, BOEM should recognize this may change in the future. The paucity of recreational fishing data regarding effort within the Draft WEAs remains an issue that must be addressed at some point, ideally before identifying final WEAs but definitely before any leases are proposed.

Other fishing sectors, such as the whiting (Pacific hake) trawl fisheries, also depend on information about the migratory patterns of salmon, when they migrate and population status of specific species. While salmon may be caught unintentionally as bycatch, trawl fisheries must abide by strict rules to avoid them. Full development of the WEAs could interrupt these migratory patterns and cause greater unintended consequences to not only the directed salmon fisheries but also other fisheries that take them incidentally. In addition, displaced fisheries from within the draft WEAs may potentially increase impacts with bycatch and protected species inshore of the draft proposed WEAs through fishing ground compression which would limit the operational area needed to minimize and avoid potential negative interactions. **In order to minimize potential impacts to commercial and recreational salmon fisheries, the Council recommends BOEM conduct targeted outreach with representatives of these fisheries to fill data gaps to better inform potential final WEAs.**

Groundfish fisheries - sectors and specific gear types

The Council’s [Pacific Coast Groundfish Fishery Management Plan](#) (FMP) includes more than 100 different species. Most live on or near the bottom of the ocean. The FMP includes benthic and pelagic rockfish, 12 species of flatfish, six species of roundfish, including species like Pacific hake (whiting) and sablefish that are economically important species on their own; sharks and skates and more. Several gear types are used to harvest groundfish, including bottom and midwater trawls, bottom longlines, pots or traps, etc. Some of the fishing effort is broken out to different sectors by gear type or by the management system used to keep the fisheries sustainable (individual

quota program, trip limits, cooperatives, etc.). Groundfish also supports a vital recreational fishery in all three West Coast states. Full descriptions and management of each sector can be found in the most recent edition of the Status of the [Pacific Coast Groundfish Fishery Stock Assessment and Fishery Evaluation \(SAFE\)](#) document (July 2022, for reference here).

Using OROWindMap and based on input from fishing industry participants, several fishing sectors and gear types, and the potential challenges each may face with the Draft WEAs, are described in this section. Potential solutions are included here, while retaining contiguous areas that BOEM could potentially identify for OSW leasing. The Council process incorporates traditional fishermen's knowledge, and state, Tribal and Federal fishery managers' expertise in decisions. With this in mind, **the Council recommends the following.**

- **Any area within the Draft WEAs in waters shallower than 400 fathoms (731.5 meters) should be removed.** Although waters deeper than 400 fathoms have been used for fishing in some form or another, most groundfish fishing takes place in areas shallower than 400 fathoms. Groundfish trawlers, specifically, depend on these shallower areas to harvest the mix and volume of species that seafood processors need to meet market expectations. This mix is frequently referred to as the DTS (Dover, thornyheads and sablefish) complex because the primary species include Dover sole, shortspine thornyheads and sablefish. By adjusting the depth and location of fishing, a trawl captain can change the percentages of these and other market species to achieve the quantities requested by seafood processors while minimizing the catch of fish and species that are not targeted. Compression of the fishing grounds shoreward of the 400-fathom curve due to OSW energy developments will severely impact the trawler's ability to adjust their fishing strategies to catch the mix of fish processors need. Therefore, aliquots shallower than 400 fathoms should be removed from the Draft WEAs.
- **Areas with sharp corners or "pan-handle"-like protrusions are difficult to fish around with mobile gear and even some fixed gears.** The Council recognizes the aliquots, by nature, are square and that some protrusions are necessary to estimate fathom curves or for other reasons. Vessels utilizing mobile gears, such as trawl, cannot make sharp turns. Fixed gears, like groundfish pots and groundfish longlines may also be unable to set their gears near these corners due to potential current drift or weather that may push the gear into or near an aliquot where an anchor, interarray cable, transmission line or anchor line is located. Generally, minimizing these protrusions will make it easier for fishermen to adjust their fishing behavior. We make specific suggestions below.

In order to minimize potential impacts to commercial and recreational groundfish fisheries, the Council recommends BOEM remove any aliquot having waters shallower than 400 fathoms (731.5 meters) as well as areas with sharp corners or "pan-handle"-like protrusions that are difficult to fish around.

Groundfish: Bottom longline

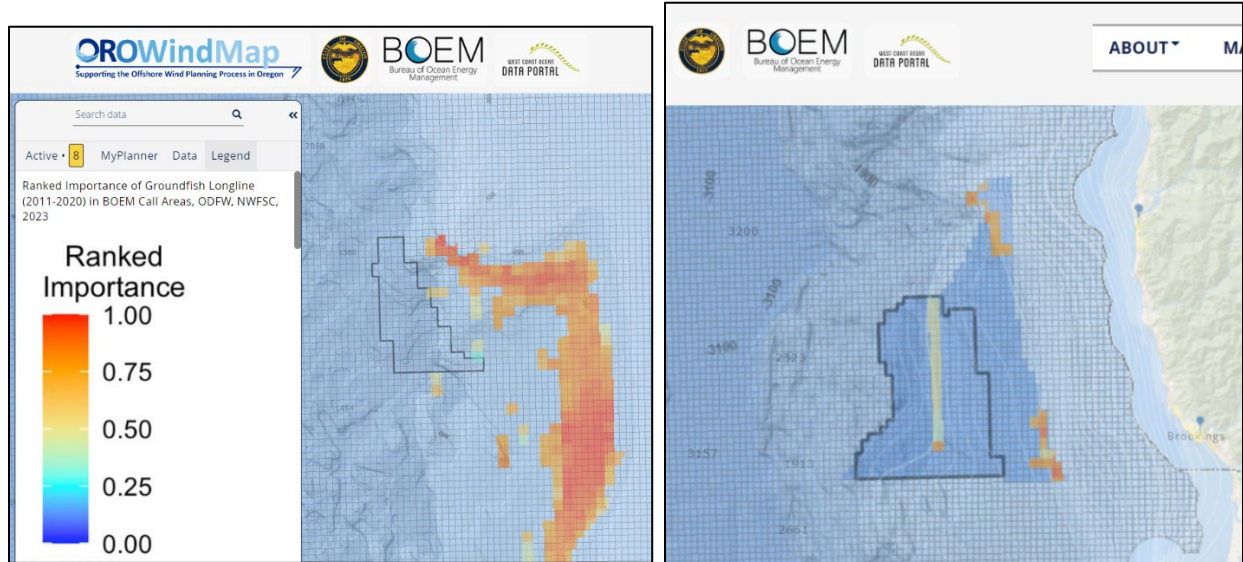


Figure 9: Groundfish bottom longline fishing effort using ODFW and NWFS ranked fisheries data. OROWindMap link: <https://bit.ly/3PyPfu5>. (left: Draft WEA A; right: Draft WEA B).

Groundfish bottom longline fisheries include a groundline weighted to the seafloor by anchors on each end, with buoy lines running to the surface to which a flag is attached to identify retrieval. Hooks are attached to the groundline. Longlines are typically set along a fathom curve or seafloor formation and used to fish for sablefish and halibut. While not considered a mobile gear, like trawl, longlines can be susceptible to currents, broken buoy lines due to interaction with a vessel, etc. Therefore, fishermen using longlines would likely not want to set gear too close to an aliquot corner, like those in eastern center section and bottom southeast corner of the Coos Bay Draft WEA A (Figure 9) or near an OSW turbine anchor, as the gear could drift into a WEA and become lost.

There is fishing activity in the center of the Brookings Draft WEA B, concentrated in a north-south line. Removing these areas from the Draft WEA would allow longliners to set along the fathom curve or seafloor feature that has historically been fished. Additionally, removing the eight aliquots below that center channel would create a travel-through/transit area for fishermen that would alleviate the need to make the return trip to the northern end to exit the WEA (See Figure 17 and Figure 18). This continuous transit opportunity would create efficiencies for longliners and would increase safety for vessels and crews, especially those that operate in this area during the spring and summer when the prevailing wind is out of the northwest.

Groundfish: Pots/traps

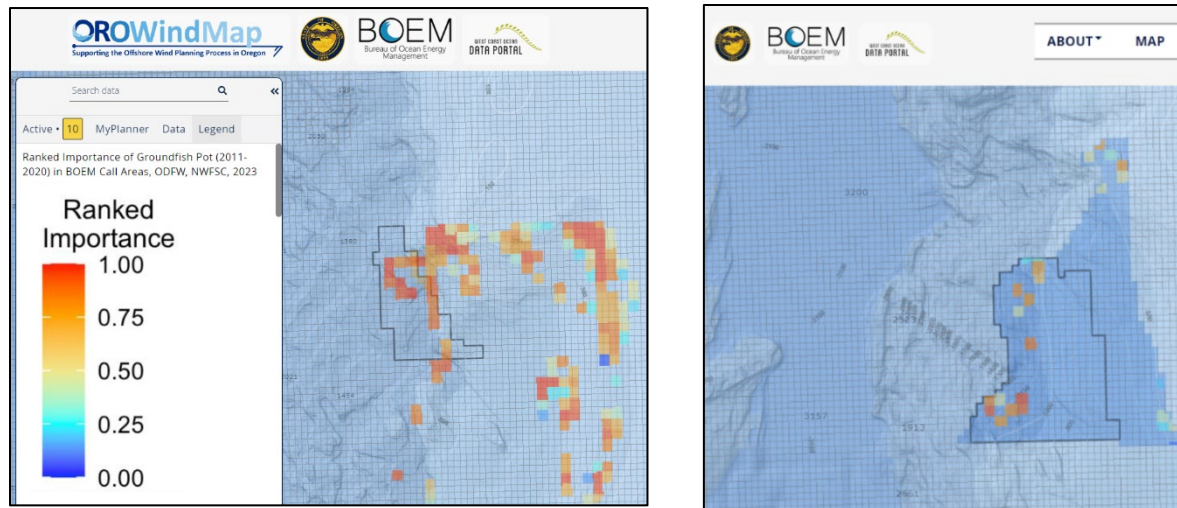


Figure 10: Groundfish pot ranked importance using ODFW and NWFS data. OROWindMap link: <https://bit.ly/3RB1OAT> . (left: Draft WEA A; right: Draft WEA B).

Groundfish pot/trap fisheries target sablefish, a highly valued fish on the West Coast. Pot and trap fishermen harvest between \$4 million and \$7 million annually of sablefish; those numbers double when other species are also considered. However, due to the operation of this gear type, pots and traps may not be set in the same areas as bottom longlines that also target sablefish. The pots and traps may be in very discrete areas, making selection of edge aliquots more difficult than for other groundfish gear types. The northeastern section of the Coos Bay Draft WEA A and the southwest area of the Brookings Draft WEA B remain highly utilized areas (Figure 10) especially as fish move and depending on ocean conditions. Sablefish generally inhabit the same areas year over year, but stock size may also lead to changes in fish behavior. Additionally, the establishment of a Take Reduction Team (TRT) to implement changes to reduce whale entanglements will have an unknown effect on future fishing behavior. In other words, build-out of OSW leases may force pot/trap fishing (and other sectors) into areas with greater risk of marine mammal interactions.

Seafloor features and bathymetry largely account for the changes in fishing behavior between longlines and pot/trap fishing. Based on this rationale, **BOEM should consider removing specific aliquots from the Draft WEAs** (see Figure 17 and Figure 18).

Groundfish: Bottom trawl

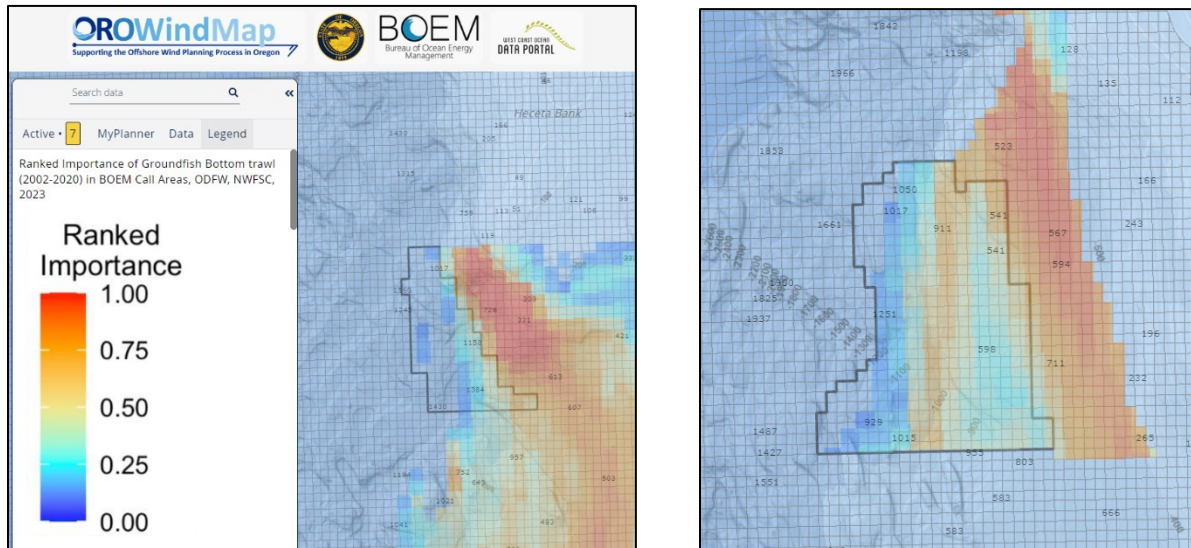


Figure 11: Groundfish bottom trawl ranked importance using ODFW and NWFSC ranked fisheries data. OROWindMap link: <https://bit.ly/3PINiEW>. (left: Draft WEA A; right: Draft WEA B).

Groundfish bottom trawl fisheries use nets towed behind a vessel; therefore, they are considered “mobile gear” and cannot make sharp turns while fishing. Trawlers also frequently tow along fathom curves or seafloor features where their target species and/or complex (more than one species caught in the same area) occurs. Trawling accounts for a significant amount of groundfish volume delivered to Crescent City and Eureka, California; and Brookings, Coos Bay (Charleston), Newport, Garibaldi and Astoria, Oregon. Trawlers may also fish in one state and deliver to another, frequently traversing fishing grounds from Washington to California. It is imperative that fisheries using mobile gear have sufficient space in which to drop their nets, turn, retrieve their gear and move according to changes in fishing activity or weather. It is also foreseeable that trawlers displaced from the Humboldt OSW area may depend on fishing opportunities in Oregon.

It is clear from Figure 11 that trawlers also utilize a similar corridor in the middle of the Brookings Draft WEA that bottom longliners do. In the same fashion, removing the aliquots in that corridor would enable trawlers to access a traditional fishing area that has historically been important and may become critically important in the future. Removing the aliquots in the actively fished area will create a “travel-through” or transit zone so vessels would not have to enter from the north, fish all the way down the corridor, then return north to exit the WEA. The same reasons that applied to bottom longline fishing apply here: greater operational efficiency; increased safety, especially if more than one vessel is trawling the same area; and ensuring operational mobility during inclement weather.

These areas also do not fully account for significant regulatory changes that have affected the bottom trawl sector; the fishery has evolved over decades. Trawlers have had to adjust their business plans and operations to account for a number of stocks being declared overfished and subsequently rebuilding, a trawl individual quota program being implemented, changes to the trawl

Rockfish Conservation Area, and more. Processors, too, that depended on volumes of groundfish, had to modify their business models. BOEM should recognize that OSW development will likely disrupt shoreside support systems when transmission cables are laid and limited port areas may be devoted to wind components or support vessels. Eliminating specific areas or aliquots will preserve traditional fishing areas that may have been subject to limited fishing activity recently. In other words, it is clear these areas have been important in the past and should be preserved for future use as stocks and ocean conditions change, thereby also supporting the shoreside infrastructure such as processors, fuel docks, marine supply stores, etc. See Figure 17 and Figure 18 for a composite set of aliquots that BOEM should consider for removal from the Draft WEAs.

Groundfish: Shoreside hake (Pacific whiting)

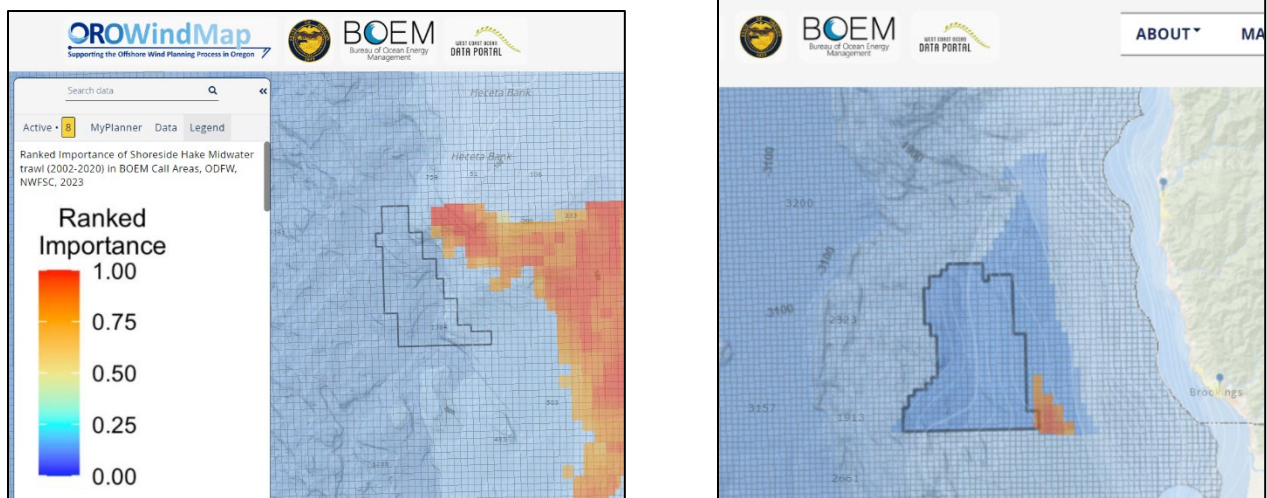


Figure 12: Shoreside hake fishing ranked importance using ODFW and NWFSC ranked fisheries data. OROWindMap link: <https://bit.ly/3ZCi1HX>. (left: Draft WEA A; right: Draft WEA B).

Shoreside hake (Pacific whiting) vessels are similar in size to bottom trawl vessels, but fish on congregating schools of hake that are higher in the water column. These vessels catch the hake then deliver to processing plants on shore. They follow schools of whiting and must adhere to strict regulations regarding bycatch of other species. Therefore, they may choose to fish in an area that has the best opportunity for clean tows of whiting and also to avoid bycatch.

Hake is considered a large volume fishery that is one of the most economically important singular groundfish species on the West Coast. About 25 vessels fish for shoreside processors annually. The U.S. has international treaty obligations with Canada for its management from British Columbia to California.

Shoreside whiting fishing vessels also require large areas for turning around and maneuvering around aliquot corners or seafloor features, such as the southeast corner of the Brookings Draft WEA. Removing important areas from the Draft WEAs will afford these vessels the opportunity to retain their operating efficiency and flexibility while remaining safe at sea. See Figure 17 and Figure 18.

Groundfish: At-sea hake (whiting), mothership sector

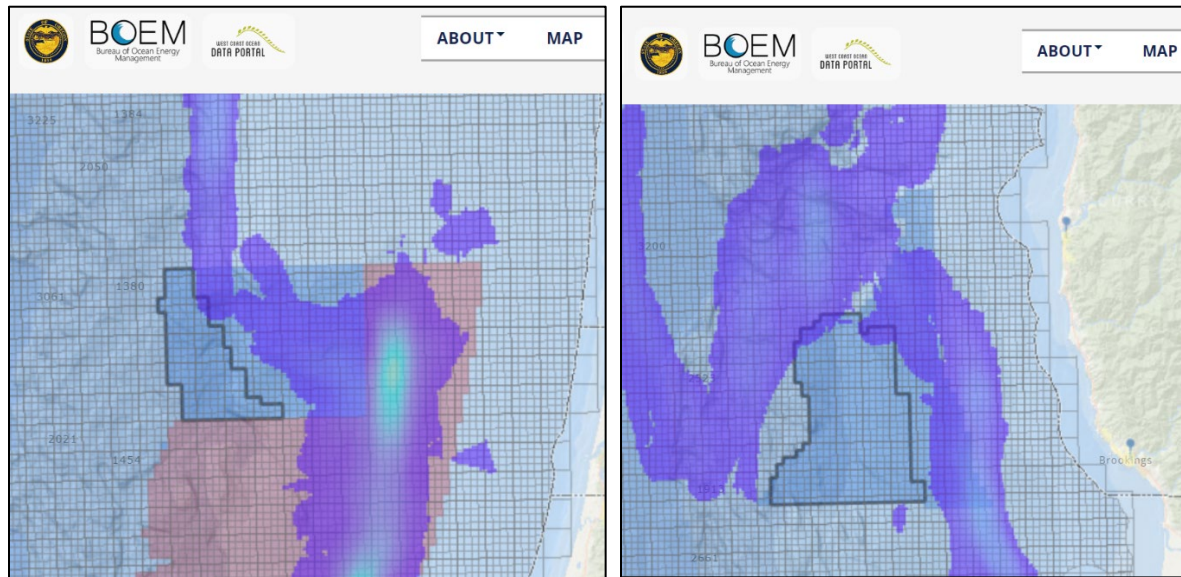


Figure 13: At-sea mothership sector intensity, 2011-2015, using NWFSC FRAM data. OROWindMap link: <https://bit.ly/3LI6OAA>. (Left: Draft WEA A; right: Draft WEA B).

At-sea mothership vessels and their associated catcher vessels target hake (Pacific whiting). Motherships are large vessels that contract with trawler catcher-vessels similar in size to the shoreside trawl vessels. Many of the shoreside vessels also participate in the mothership sector. The catcher boats use trawl nets to catch hake, then transfer the net to the mothership, which proceeds to receive the catch from the catcher vessels, process it, package it and freeze it for delivery to onshore distribution facilities later. While motherships do not actually harvest the fish, the fleets of catcher vessels that travel with them do target abundant schools of hake using midwater trawl nets. This sector is also subject to strict bycatch avoidance rules and regulations. Therefore, their fleet operations may be limited by not only target species abundance, but bycatch avoidance of other groundfish species or salmon.

Figure 13 shows mothership activity within the Draft WEAs in the 2011-2015 time frame. The fishing intensity during this time period provides a better indication of the importance of areas within and near the two Draft WEAs, because the fishing locations of the mothership sector are quite variable between years. Nonetheless, in certain time frames, the areas in and around the Draft WEAs are very important and very productive. In many years, it is impossible to predict which areas or portions of the Draft WEAs will be important in the future as stocks change and the ocean changes. As noted under “General Comments and Suggestions,” removal of aliquots shallower than 400 fathoms would help the catcher vessels participating in the mothership sector, since most of their target species, hake, is caught in those areas.

It is important to note that both the Draft WEA A and Draft WEA B are in close proximity to productive fishing grounds for both at-sea fleets (motherships and catcher-processors) and the Council remains concerned about offshore wind’s potential negative impacts to upwelling and ecosystems. Renewable energy development in one area should not create unintended

consequences for adjacent fishing areas that at-sea hake fisheries and shoreside hake fisheries deem essential to their harvest and processing operations.

Safety at sea is a pivotal concern. More than one mothership and its associated catcher vessels may work in the same area if the target species, hake, is abundant and bycatch is low. Motherships require maximum flexibility and space for at-sea processing operations, especially when multiple vessels are operating in the same area at the same time.

Referencing these figures, specific areas should be considered for removal in order for the mothership sector to retain historical opportunities for fishing. See Figure 17 and Figure 18.

Groundfish: At-sea hake (whiting), catcher-processor sector

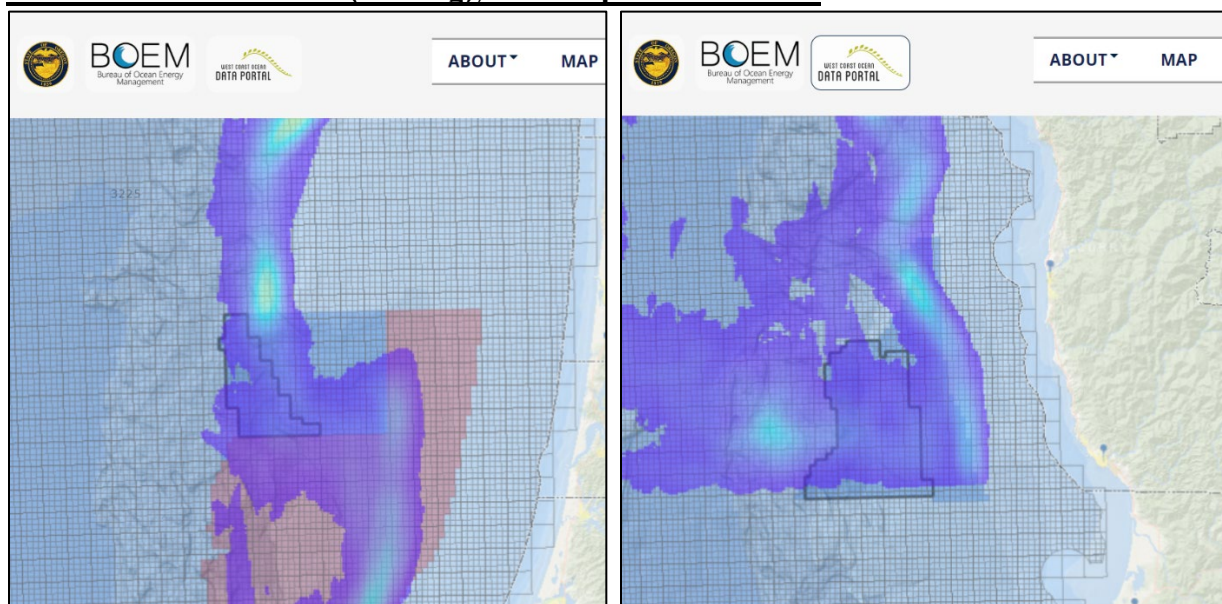


Figure 14: At-sea catcher-processor intensity, 2011-2015, using NWFSC FRAM data. OROWindMap link: <https://bit.ly/3LBF93y>. (Left: Draft WEA A; right: Draft WEA B).

The at-sea catcher-processor (CP) sector includes large vessels that tow equally large midwater trawl nets for a single species, Pacific hake (whiting). They then bring the nets aboard, unload the fish and process, package and freeze it onboard. These large trawlers, like the smaller bottom trawlers, also need large areas for turning or changing course. The close proximity of the Draft Coos Bay WEA A to highly productive and important fishing grounds would effectively preclude the ability of the at-sea CP sector to access these areas because of the risk of entanglement of nets with OSW infrastructure.

The above figures show the years during which the CP sector frequented both draft WEAs. According to the rest of the dates in the NWFSC FRAM dataset, the CPs did not frequent the areas outside of the 2011-2015 time frame. This area is important for several reasons: Target species may be move into these areas for reasons relating to temporary or permanent ocean changes; or species caught as bycatch may move *out* of these areas during ocean changes while the target species, hake, is in relative abundance. That is, the areas may be important for bycatch avoidance.

For example, between 2014 and 2016, the West Coast experienced an unprecedented [marine heatwave](#) (“The Warm Blob”), which temporarily changed fish congregations and fishing behavior. This likely influenced the CP sector’s change in fishing patterns off the southern Oregon coast.

As changes in the ocean occur and another strong El Nino appears to be forming, these areas may once again be important to the CP sector. Therefore, we suggest removing several areas that are adjacent to productive fishing grounds to maintain vessels’ maneuverability and to allow for flexibility in harvesting operations into the future. See Figure 17 and Figure 18.

Groundfish: Recreational bottomfishing effort

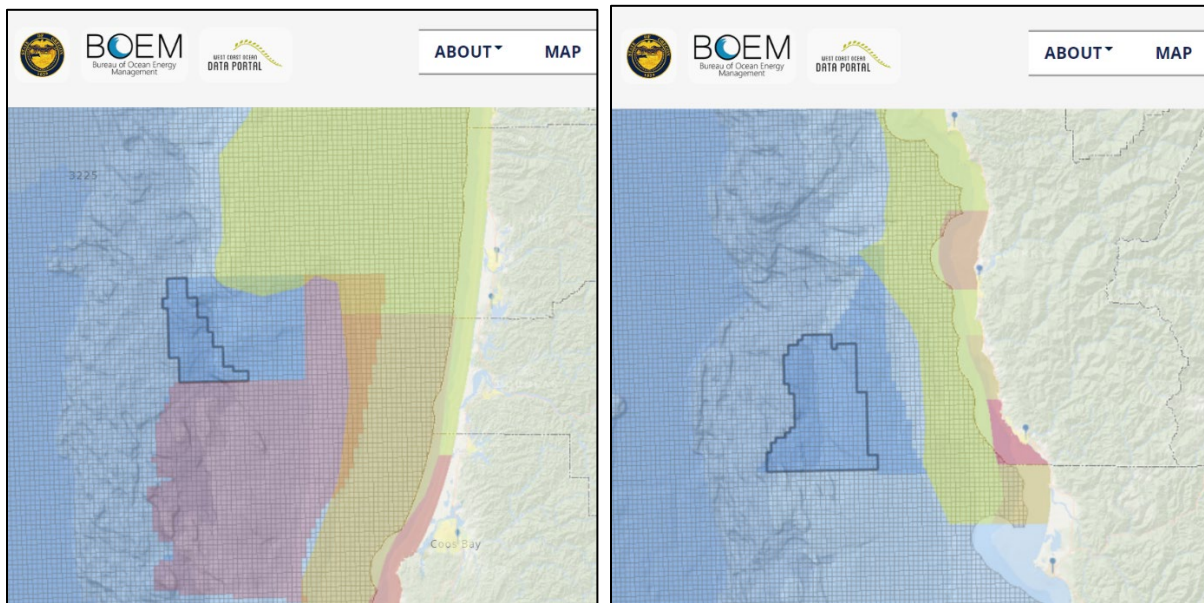


Figure 15: ODFW recreational bottomfishing trips by reef, 2015-2020. OROWindMap link: <https://bit.ly/3LF9cHM>. (Left: Draft WEA A; right: Draft WEA B).

Recreational fishing effort includes small, private vessels and charter vessels, both of which are important to the coastal economies of northern California ports and Brookings, Gold Beach, Bandon, Coos Bay, Winchester Bay, and Florence in Oregon, all ports near the Draft WEAs.

Both private and charter vessels target rockfish and other species, but the maps above show the primary recreational effort is closer to shore and well shoreward of the Draft WEAs (Figure 15). However, as restrictions around rockfish, salmon or halibut increase, sport fishermen will seek other species to target. For example, deepwater lingcod, Pacific halibut and offshore rockfish. Currently, sport fishermen in Oregon are looking for additional opportunity to pursue recreational fishing for sablefish. Both private and charter fishermen will likely fish farther offshore and in many of the same areas as the sablefish longliners and pot/trap fishermen. The paucity of datasets available complicates consideration of recreational effort within the Draft WEAs. Conducting outreach to recreational fisheries would better inform BOEM of potential impacts to and conflict with these economically important fisheries.

In order to minimize potential impacts to recreational bottomfish fisheries, the Council recommends BOEM conduct targeted outreach with representatives of these fisheries to fill data gaps to better inform potential final WEAs.

The importance of spawning areas

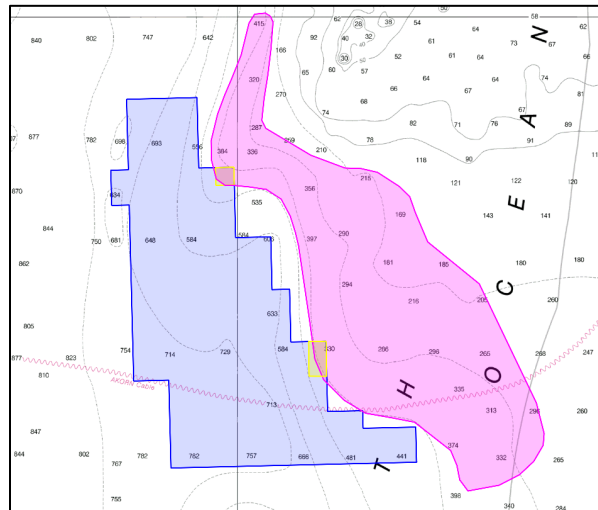


Figure 16: Draft Coos Bay WEA (A) in blue; Dover and petrale winter spawning areas in pink (Source: fishing industry input).

Dover and petrale sole are important species to the groundfish bottom trawl sector. Average ex-vessel values alone equate to between \$9 million and \$14.5 million annually over the past five years. Protecting the traditional areas targeted for fishing these bottomfish is complemented by removing areas from potential OSW sites in which spawning occurs.

OROWindMap does not include the Dover and petrale sole spawning areas, but trawlers have identified the area in pink in Figure 16 as the primary area for these two stocks off the southern Oregon Coast. **The Council recommends that BOEM include these data and explore the inclusion of other ecosystem-based data layers for inclusion in the NCCOS suitability model.**

Summary of areas integral to fishing activities

Based on the rationale, maps, and data described above, the **Council recommends removal of the aliquots below from the Draft WEAs.** The aliquots highlighted in yellow are a composite representing all fishing sectors and other factors (e.g., spawning and nursery areas) described above. These aliquots are listed in **Table 1** below.

**DRAFT WEA A
All Sectors**

Aliquots	6170E	6220L
	6170F	6220M
6017P	6170G	6220N
6018D	6170I	6220P
6018E	6170J	6221E
6018H	6170K	6221I
6018I	6170O	6221J
6018L	6218H	6221K
6018M	6218K	6221L
6019M	6218L	6221M
6019N	6218O	6221N
6068E	6218P	6221O
6068I	6219F	6221P
6068M	6219G	7167M
6069A	6219H	7167N
6069B	6219I	7167O
6069F	6219J	7167P
6069J	6219K	
6069O	6219L	
6069P	6219M	
6118E	6219N	
6118I	6219O	
6119D	6219P	
6120I	6220C	
6120M	6220F	
6168E	6220H	
6168I	6220I	
6170A	6220J	

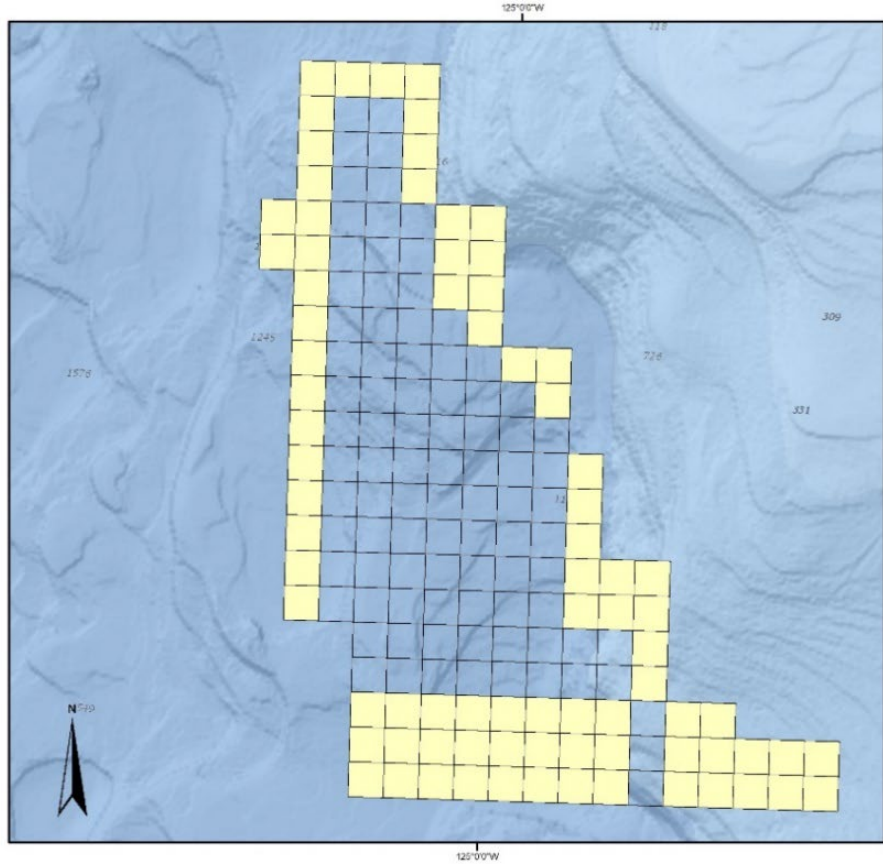


Figure 17: Composite of all aliquots recommended for removal from the Draft Coos Bay WEA, based on importance to fishing sectors managed by the Council.

Table 1: Aliquots proposed for removal from Draft WEAs

Draft WEA A (Coos Bay)					
6017P	6069B	6170E	6219G	6220I	6221O
6018D	6069F	6170F	6219H	6220J	6221P
6018E	6069J	6170G	6219I	6220L	7167M
6018H	6069O	6170I	6219J	6220M	7167N
6018I	6069P	6170J	6219K	6220N	7167O
6018L	6118E	6170K	6219L	6220P	7167P
6018M	6118I	6170O	6219M	6221E	
6019M	6119D	6218H	6219N	6221I	
6019N	6120I	6218K	6219O	6221J	
6068E	6120M	6218L	6219P	6221K	
6068I	6168E	6218O	6220C	6221L	
6068M	6168I	6218P	6220F	6221M	
6069A	6170A	6219F	6220H	6221N	
Draft WEA B (Brookings)					
6768P	6821P	6970B	7019G	7068E	7072L
6769G	6822A	6970C	7019I	7068F	7072P
6769J	6822E	6970D	7019J	7068G	7073I
6769M	6822I	6970F	7019K	7068H	7073M
6770G	6822M	6970G	7019M	7068I	7117C
6770H	6870C	6970H	7019N	7068J	7117D
6770K	6870D	6970J	7019O	7068O	7118A
6770L	6870G	6970K	7020B	7068P	7118B
6770O	6870H	6970L	7020F	7069A	7118C
6770P	6870K	6970N	7020G	7069B	7118D
6771O	6870L	6970O	7020H	7069C	7119A
6771P	6870O	6970P	7020J	7069E	7119B
6771N	6870P	6972B	7020K	7069F	7119C
6772M	6920C	6972C	7020L	7069G	7120A
6818D	6920D	7017P	7020N	7069I	7120B
6820C	6920G	7018D	7020O	7069J	7122D
6820D	6920H	7018G	7020P	7069K	7123A
6820G	6920K	7018H	7067D	7069M	7018K
6820H	6920L	7018I	7067G	7069N	7019A
6820K	6920N	7018J	7067H	7069O	7068K
6820L	6920O	7018L	7067K	7070B	7068L
6820O	6920P	7018M	7067L	7070C	7068M
6820P	6922I	7018N	7067O	7070D	7068N
6821B	6922G	7018P	7067P	7070F	
6821C	6922J	7019B	7068A	7070I	
6821D	6922K	7019C	7068B	7070J	
6821H	6922N	7019E	7068C	7070M	
6821L	6922O	7019F	7068D	7070N	

2.2 Habitat and Ecosystem Concerns and Recommendations

The Council recognizes BOEM's goal of siting WEAs to generate sustainable energy, and if WEAs were designed to avoid sensitive habitats, goals for both sustainable energy and fisheries might be achieved. But BOEM's current wind suitability mapping appears to discount key habitat features in their siting of WEAs and associated infrastructure. Therefore, the Council provides the following recommendations to maintain habitat protections as wind energy is further planned along the Pacific Coast. These recommendations stem from Council authorities to protect EFH and include protections not only within WEAs but along potential cable routes to ports.

Council authorities

Essential Fish Habitat Provisions of MSA

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 effects 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 are likely to substantially affect the habitat of an anadromous fishery resource under its authority (Section 305(b)(3)(B)).

EFH Conservation Measures

Consistent with 50 CFR 600.815(a), the Council describes EFH conservation measures in its FMPs. 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 one or more of the following considerations for designation: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent, development activities are, or will be, stressing the habitat type; or the rarity of the habitat type. Activities that could affect HAPCs receive greater

scrutiny during EFH consultations. HAPC designations for groundfish are rocky reefs (i.e., waters, substrates and other biogenic features associated with hard substrate), canopy kelp, seagrass, estuaries, and “Areas of Interest” (e.g., unique seamounts and canyons). HAPC designations for salmon are marine and estuarine submerged aquatic vegetation, estuaries, spawning habitat, complex channels and floodplain habitats, and thermal refugia. Many other important habitat features are described as EFH for groundfish, including methane seeps and coral/sponge habitats.

Potential impacts and conservation recommendations for numerous non-fishing activities are developed for each FMP. The [Pacific Coast Groundfish FMP](#) (PFMC 2020) includes conservation recommendations specific to seafloor cables and OSW facilities, as well as numerous other activities. For seafloor cables, conservation recommendations are provided to address direct impacts to organisms, release of contaminants, alteration of electromagnetic fields, and noise effects. For OSW facilities, conservation recommendations are provided to address loss and alteration of habitat, sedimentation, siltation, and turbidity, direct impacts to organisms, alteration of electromagnetic fields, and noise effects.

Draft WEA siting decision and habitat information

The Council remains concerned about the effects of wind energy development on the habitats of Council-managed species and of non-managed species whose population status may constrain Council fisheries or otherwise provide ecosystem benefits. In response to BOEM’s April 2022 Call Notice, the Council recommended that BOEM enlist the assistance of NCCOS to conduct a robust geospatial compatibility analysis that incorporates all relevant data to identify areas where wind farms, ecosystem resources and existing ocean uses can successfully coexist (PFMC 2022a). The Council appreciates that BOEM sought assistance from NCCOS and NMFS to provide a geospatial suitability model intended to inform WEA siting. The NCCOS habitat sub-model (“Scenario 1”) described in the Draft Report indicated substantial areas of the Coos Bay and Brookings Call Areas unsuitable for wind energy development and yet substantial portions of habitat-incompatible areas are included in the Draft WEAs. It is unclear how BOEM utilized the data or arrived at its decision for siting the two Draft WEAs, as this is not sufficiently discussed in the Draft Report.

The Council recommends BOEM detail exactly how the NCCOS habitat sub-model was interpreted in the designation of Draft WEAs, given that habitat-incompatible areas are included in the Draft WEAs.

Also, in response to BOEM’s Call Notice, the Council recommended that BOEM consider all available seafloor mapping data in the analysis to identify previously unmapped rocky habitat likely to be affected by OSW projects and cable routes. Several high-resolution multibeam datasets have been published in recent years (2016-2023) by various sources (OSU/CIMERS NOAA PMEL/EIO, NOAA/OCS, USGS¹⁶) but there is no indication these data informed BOEM’s decision on Draft WEA siting. Recent work by Merle et al. (2021) identified methane carbonate outcrops (i.e., rock) using the US Cascadia Margin Multibeam Backscatter (USCMMB) high-resolution data which covers nearly 40% of the US Cascadia margin (Strait of Juan de Fuca to

¹⁶ Oregon State University (OSU)/Cooperative Institute for Marine Ecosystem and Resources Studies (CIMERS); National Oceanic and Atmospheric Administration (NOAA)/Pacific Marine Environmental Laboratory's Earth Ocean Interactions Program (PMEL/EIO); NOAA/Office of Coast Survey (OCS); US Geological Survey (USGS).

Mendocino Ridge). As with all rock, carbonate rock qualifies as rocky reef HAPC for groundfish. More than 1,000 sq. km. of carbonate rock was delineated within the USCMMB footprint, of which 100 sq km is in the two Oregon Call Areas and 41 sq km is in the two Draft WEAs (Figure 19). This data are available from Merle et al. (2021) upon request. This new habitat information stresses the importance of using all available high-resolution seafloor mapping data to identify sensitive habitats within the Draft WEAs and throughout the region that will be affected by wind energy projects and associated cable routes. To our knowledge, the CMECS-reclassified “SGH v.4” HAPC data layer (source: Goldfinger et al., 2014) was the only seafloor mapping data that informed BOEM’s decision on WEA siting.

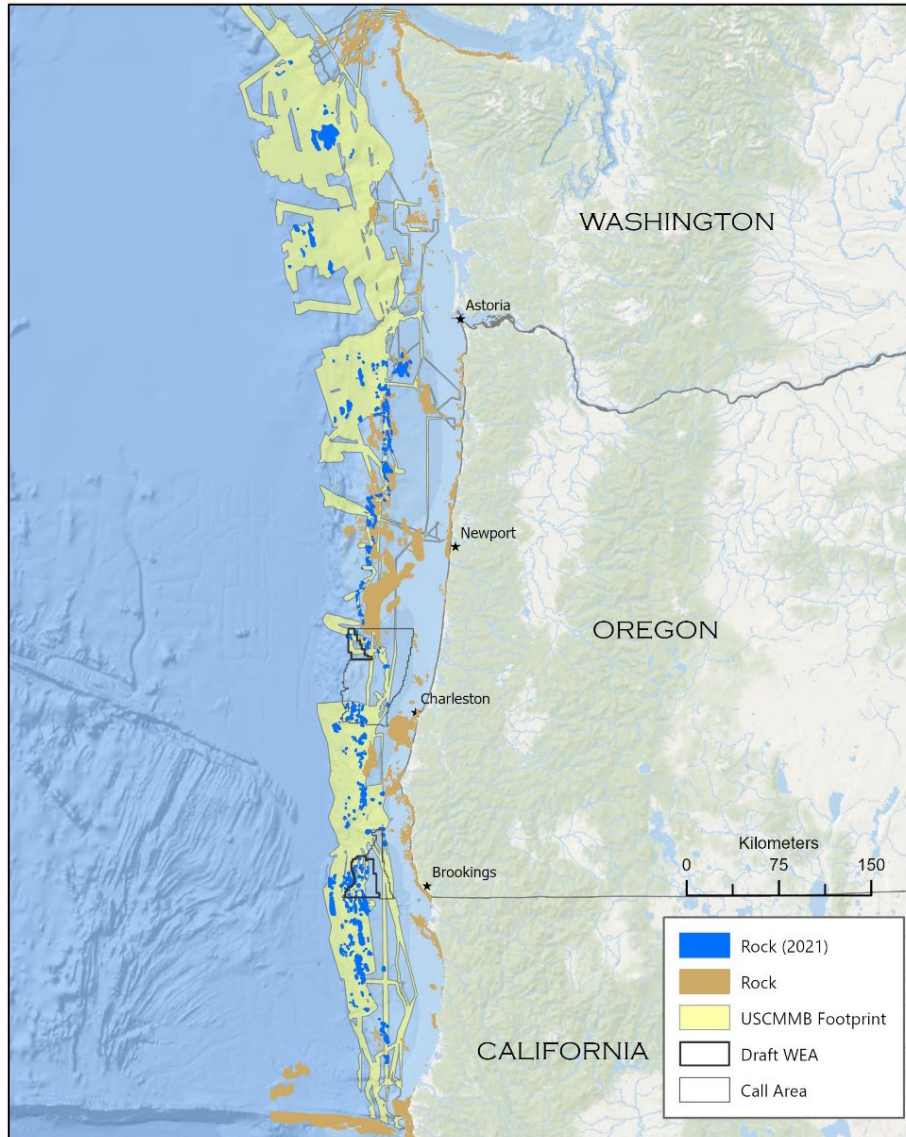


Figure 19: Map of methane-derived carbonate rock (blue polygons) on the Cascadia Margin identified by Merle et al (2021) in high-resolution multibeam backscatter data (yellow). Analysis limited to areas within the backscatter footprint that also coincide with water column bathymetry data. Backscatter data source: US Cascadia Margin Multibeam Backscatter (USCMMB)] (Merle, et al. 2021).

While significant mapping efforts have occurred in deeper offshore waters, most of the region shoreward of the 200 m isobath has not been mapped with sufficient resolution to discern rocky seafloor, with the exception of some discrete areas. Additional mapping and seafloor characterization will be necessary to discern rocky habitats and inform cable route planning.

The Council strongly recommends BOEM use recent (2016-2023) high-resolution mapping data to identify sensitive habitats not delineated in SGH v.4 (Goldfinger et al. 2014), particularly rocky reef HAPC, throughout the region that will be affected by wind energy projects and associated cable routes. The Council also recommends that BOEM put forth additional resources to ensure appropriate seafloor mapping and characterization happens in waters <200 m prior to cable route planning.

Draft Coos Bay WEA (WEA A) - Habitat resource of concern and recommendations

Shelf Break and Wind Wake Effects

In response to BOEMs April 2022 Call Notice, the Council recommended against siting WEAs in the northwest portion of the Coos Bay Call Area where sensitive habitats and ocean dynamics make this area unsuitable for wind energy projects. Draft WEA A borders the shelf break and the western flank of Heceta Bank, just 7 km (4.3 miles) west of the Bank plateau. As we explained, Heceta Bank is one of the most productive and biodiverse regions on the Oregon shelf, fueled by ocean dynamics and circulation patterns unique to this region in the southern area of the Bank. Large scale installations can disturb benthic/pelagic processes, and turbine arrays can create wind deficits downwind of the arrays up to several miles that may affect ocean dynamics and ecosystem function in surrounding areas (Akhtar et al. 2021, Lloret et al. 2021). Wind deficits induced by wind energy turbines could disrupt circulation and upwelling on Heceta Bank, which could further exacerbate seasonal hypoxic conditions unique to the southern region of the bank, as well as affect overall ocean productivity on the bank. Loss of ocean productivity on and near Heceta Bank remains a primary concern of the Council.

The Council recommends BOEM initiate and expedite efforts to model the effects of wind tower arrays on local wind forces to understand the potential long-term effects on ocean productivity on Heceta Bank and do so prior to finalizing WEAs. If such modeling indicates a likelihood of effects on Heceta Bank, then the Council recommends removing aliquots that are within range of contributing to those affects.

Benthic Habitat Resources

Significant benthic habitat resources are concentrated in the northern region of Draft WEA A (Figure 20). Aliquots **NK10-01/ 6018F, 6018I, 6018J, 6018M, 6018N** overlap several carbonate rock outcrops totaling 5 sq km (identified by Merle et al., 2021) which coincide with methane seep bubble streams that support one of the most diverse seep faunal communities discovered during NOAA's Nautilus Research Dives NA072 and NA095 (Embley 2016, Wilkinson 2018). The northeast boundary of Draft WEA A overlaps areas of "robust high" habitat suitability for coral taxa (modeled by Poti et al. 2020). Adjacent to the coral is a massive carbonate rock structure just outside the Draft WEA, further precluding any path for possible cable routes. A significant portion of the WEA's eastern boundary either overlaps or is in proximity to the shelf break. The shelf break is a region of important ecological processes, such as upwelling, which fuels ocean

productivity (e.g., krill) and food web dynamics, and where species tend to concentrate. The habitat resources in the northern region of the Draft WEA should be protected from all activities associated with OSW projects and cable routes, including site assessment, installation, operations, and decommissioning. Sensitive benthic habitats (rock, coral, methane seeps) elsewhere in the Draft WEA should also be protected.

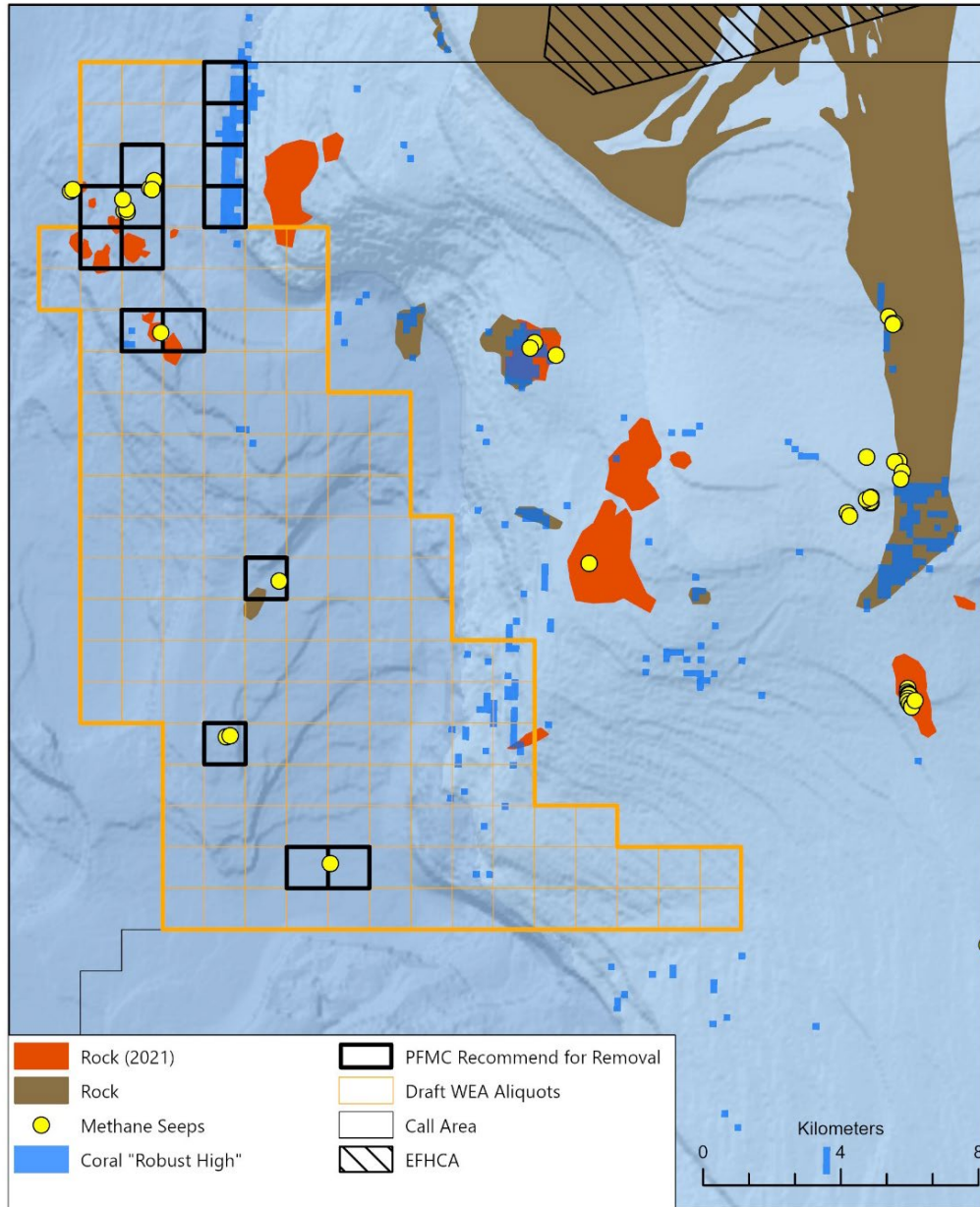


Figure 20: Aliquots outlined in black overlap sensitive benthic habitat resources (methane seeps, rock, coral) and are **recommended for removal** from WEA A by the Council to prevent offshore wind development and cable routes in sensitive areas. Methane seeps bubble streams (yellow) are from: USGS 2023, Merle et al. 2021, Riedel et al. 2018, and Johnson et al. 2015. Rock (red) is from Merle et al (2021). Coral "Robust High" (blue) is modeled habitat suitability for coral taxa associated with hard substrate (Poti et al., 2020).

The Council recommends avoiding areas with sensitive benthic habitat resources by removing aliquots within Draft WEA A that have substantial overlap with these resources (as shown in Figure 20 and Table 2). The Council recommends implementing a minimum 500 m buffer around these resources to prevent disturbance or damage from site assessment, installation and operations activities associated with wind projects and cable routes.

Sensitive benthic habitats include:

- **hard substrate (rocky reef HAPC, Goldfinger et al. 2014, Merle et al. 2021)**
- **coral habitat in Aliquots NK10-01/ 6018F, 6018I, 6018J, 6018M, 6018N (direct observation from NOAA research dives)**
- **coral habitat (“high robust” habitat suitability (Poti et al. 2020)**
- **methane seeps emission sites (Johnson et al., 2015; Riedel et al., 2018; Merle et al., 2021, Rudebusch et al., 2023)**

Draft Brookings WEA (WEA B) - Habitat resource of concern and recommendations

Benthic Habitat Resources

Significant sensitive habitat resources occur throughout Draft WEA B (Figure 21). There is 55 sq. km. of carbonate rock in Draft WEA B throughout the USCMMB coverage area (investigated by Merle et al. (2021). Where the USCMMB data coverage ends (somewhat near the 750 m or 800 m isobath), there may be additional backscatter data collected by USGS that could indicate additional rock in the eastern portion of Draft WEA B (Susan Merle, personal communication). As noted above, we recommend BOEM expedite efforts to identify rock habitat in the USGS backscatter data and other recent backscatter data in areas associated with OSW development.

Across the central and southern portion of the Draft WEA B there is broad distribution of “robust high” habitat suitability for coral taxa. Suitable habitat is most dense in the southwest portion of the Draft WEA. While in situ data of coral distribution off Oregon is limited, one area in WEA B has been identified. Aliquot **NK10-04 7018M** overlaps an extensive bamboo coral forest of large, decades-old bamboo coral which was first discovered in 2000. Subsequent NOAA surveys documented a diverse faunal community living among the bamboo coral (Embley 2018). This important and historic NOAA survey site is of continued scientific interest and study and highlights the importance of using the “high robust” habitat suitability model as proxy for coral habitat.

Numerous methane seep bubble stream sites were recently discovered and mapped in the southeast portion of Draft WEA B (Aliquots **NK10-04/ 7021H, 7021L, 7021P, 7022M, 7022B**). This is a region of ongoing research by the USGS to characterize seep emissions in the context of tectonic geomorphology and ocean warming (Rudebusch, 2023). The southern boundary of Draft WEA B is less than 100 m from the Brush Patch EFHCA which was designated to protect rock-ridge reef and sensitive coral/sponge communities (PFMC 2020). There is high risk of disturbance and damage to this sensitive habitat given the proximity to activities associated with site assessment, installation, and operations.

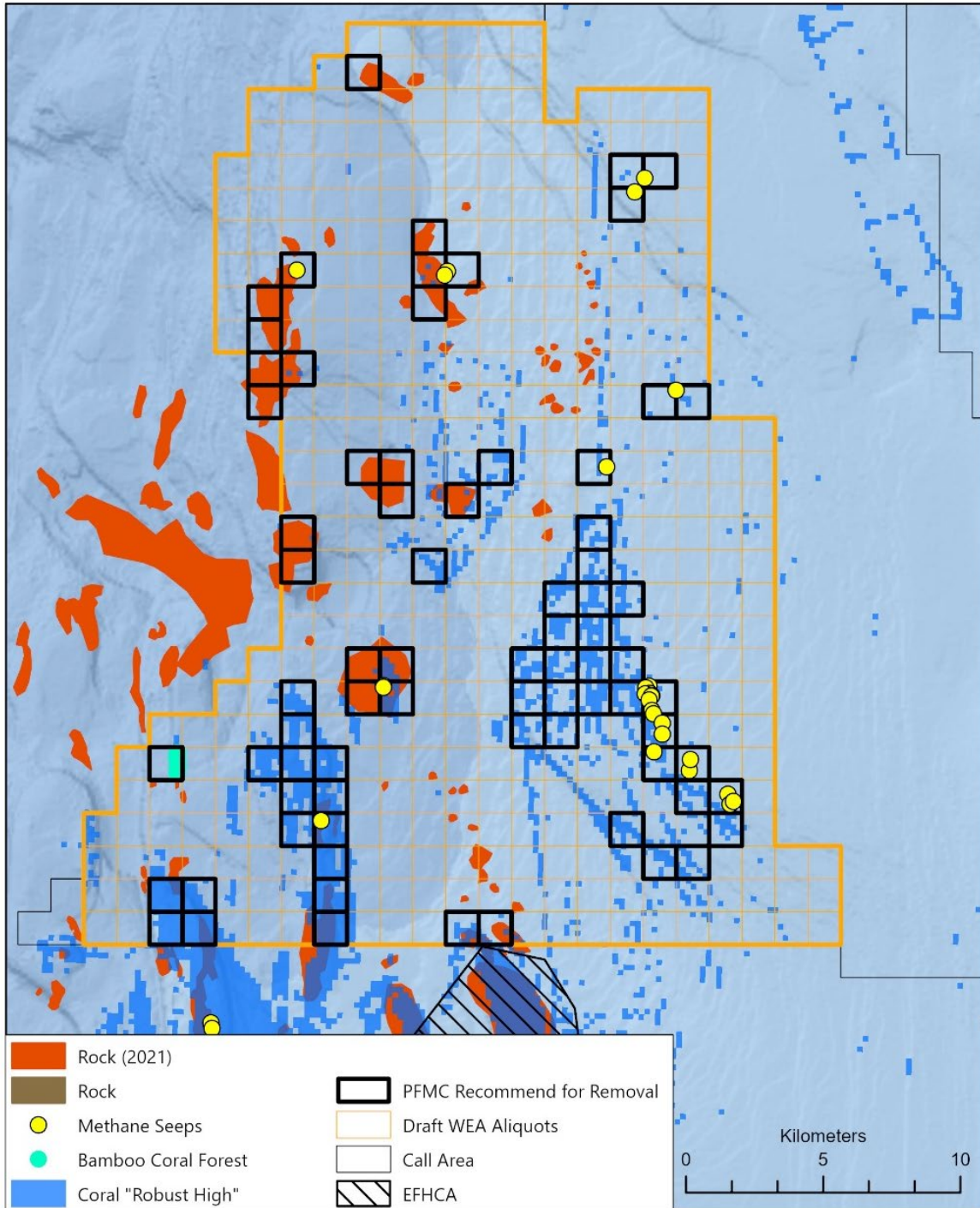


Figure 21: Aliquots outlined in black overlap sensitive benthic habitat resources (methane seeps, rock, coral) and are **recommended for removal** from WEA B by the Council to prevent offshore wind development and cable routes in sensitive areas. Methane seeps bubble streams (yellow) are from: USGS 2023, Merle et al. 2021, Riedel et al. 2018, and Johnson et al. 2015. Rock (red) is from Merle et al. (2021). Bamboo Coral Forest (bright blue) from NOAA surveys (Embley 2016). Coral "Robust High" (blue) is modeled habitat suitability for coral taxa associated with hard substrate (Poti et al. 2020).

Elsewhere in Draft WEA B are additional aliquots that overlap rock, coral and seeps habitats. These sensitive habitat resources should be protected from site assessment, installation and operations activities associated with wind energy projects in Draft WEA B and wherever cable routes are possible.

The Council recommends avoiding areas with sensitive benthic habitat resources by removing aliquots from within Draft WEA B that have substantial overlap with these resources as shown in Figure 21 and Table 2. The Council recommends implementing a minimum 500 m buffer around the resources to prevent disturbance or damage from site assessment, installation, operations activities associated with wind projects and cable routes.

Sensitive benthic habitats include:

- **hard substrate (rocky reef HAPC; Goldfinger et al. 2014, Merle et al. 2021)**
- **coral habitat in Aliquot NK10-04 7018M (direct observation; NOAA Nautilus Dive NA072)**
- **coral habitat (“high robust” habitat suitability; Poti et al. 2020)**
- **methane seeps emission sites (Johnson et al., 2015; Riedel et al., 2018; Merle et al., 2021, Rudebusch et al., 2023)**
- **Brush Patch EFHCA**

Cable routes and sensitive habitats outside the Draft WEAs

Seafloor Mapping

Protecting rocky reef HAPC and other sensitive benthic habitats (corals and methane seeps) from damage from the installation, maintenance, or presence of transmission cables is a priority for the Council. Identifying cable routes that avoid these habitat resources may be difficult and is further challenged by the lack of a high-confidence, comprehensive map of rocky habitat for the region. As discussed above, a significant portion of the deeper shelf (>200 m) has been mapped at high-resolution in recent years, but seafloor classification of the surveyed region has not been produced. The lack of high-resolution data shoreward of recent mapping efforts hinders the identification of most hard substrate and other sensitive habitats in this region. The Council’s comments are based on habitat features delineated in the available classification data (Goldfinger et al. 2014, Merle et al. 2021).

Where high-resolution seafloor data do not already exist shoreward of the final WEAs, the Council recommends BOEM expedite the collection of additional high-resolution seafloor mapping data, including habitat characterizations, to identify habitat-compatible cable route options. In addition, cable route options should be identified prior to issuing a Final Sale Notice. Doing so may prevent selecting lease areas that do not have viable cable routes.

Sensitive Habitats

The Council’s same recommendations for avoiding sensitive habitats within the Draft WEAs apply outside the Draft WEAs for planning cable routes: avoid sensitive habitats entirely by establishing a substantial buffer to protect against damage during site assessment, installation, operations and decommissioning activities associated with cable routes.

The following areas are sensitive habitats, and the Council recommends implementing 500 m buffers around them:

- **All hard substrate areas identified in SGH v.4 (Goldfinger et al. 2014), including nearshore and shoreline rocky habitat**
- **All hard substrate areas delineated by Merle et al. (2021)**
- **Hard substrate areas (including carbonate clasts) mapped/characterized by Cochrane et al. (2017)**
- **Areas with canopy kelp HAPC**
- **All methane seep bubble stream sites**
- **EFHCAs: Stonewall Bank, Heceta Bank, Deepwater off Coos Bay, Arago Reef, Bandon High Spot, Rogue Canyon, Rogue River, and Reef the Brush Patch**

Several sensitive benthic areas outside the WEAs are at particular risk from cable routes due to their locations between the WEAs and the shore.

Heceta Bank

Most of Heceta Bank was mapped with high (10 m) resolution multibeam bathymetry sonar (MBARI 1998) and is well-characterized. The top of the bank is predominantly rock ridge and boulder-cobble fields surrounded on the western and southern margins by unconsolidated sediments. The multibeam coverage of the southern flank extends southward 10 km into the Coos Bay Call Area (Figure 22). A review of the backscatter data on the southern flank confirms that a significant portion of this extension is accurately delineated as rock (boulder/cobble). Upon close examination, the multibeam backscatter data indicates an area of rock outcrop that was classified as unconsolidated sediment but appears to be hard substrate. The rock feature is located at 124.876° W between 43.91° N and 43.862° N) and extends 6 km to the south from the current delineated rock polygon. This extension of rock connects to the rock delineated by Merle et al. (2021) resulting in a continuous band of rock as far south as 43.81° N and precludes cables routes exiting the northern two thirds of Draft WEA A from being routed directly eastward. Additionally, the “leg-shaped” feature along the eastern margin of the bank is classified as rock. The portion of this feature that is west of 124.79° W is within the Monterey Bay Aquarium Research Institute (MBARI) multibeam footprint and the interpreted rock is consistent with the backscatter imagery. There is additional rock at the edge of the backscatter imagery, east of 124.79°. Additional mapping is necessary to characterize the seafloor east of 124.79° W before cable routes are considered through this area.

The Council recommends avoiding Heceta Bank entirely by implementing a minimum 500 m buffer around the Heceta Bank complex, including the western and southern flanks to encompass the additional 16 km southern extension of rocky reef HAPC discussed above.

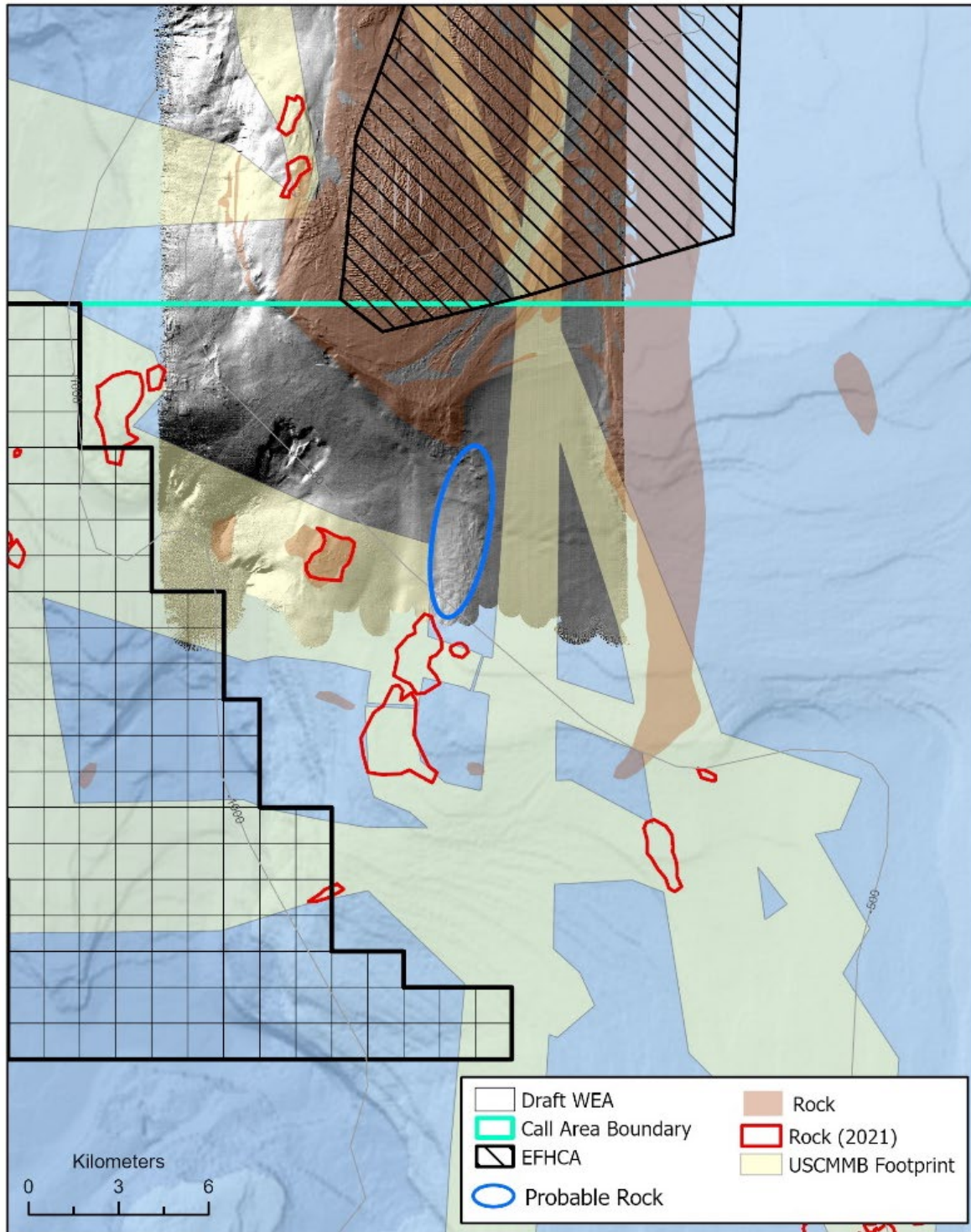


Figure 22: Probable rock (blue oval) on Heceta Bank's south flank discernable in high-resolution multibeam data (source: MBARI 1998). Backscatter imagery (USCMMB) used to identify hard substrate (red outline) by Merle et al. (2021) not available for this figure. USCMMB footprint shown in yellow.

Mud Volcano

A large, potentially ancient mud volcano is located approximately 8 miles southeast of Draft WEA-A (43.682° N latitude, 124.698° W longitude). Extensive carbonate deposits, bacterial mats, clam beds and methane seeps occupy the flank and summit with bubble streams rising 80 m from the 1 km diameter cone (Rudebusch et al., 2023). A diverse community of fishes, corals, sponges, and numerous other macrofauna are associated with the volcano and the surrounding carbonate rock. This unique geology could be damaged by cable route activities.

The Council recommends avoiding this feature entirely by implementing a minimum 500 m buffer around the carbonate rock surrounding the base of the volcano to protect this unique geology from activities associated with cable routing (site assessment, installation, operations).

Rogue Canyon and Reef Complex

Few marine areas off southern Oregon are without rocky reef HAPC or steep terrain which create numerous challenges for locating suitable cable routes away from sensitive habitats. North of Draft WEA B is the Rogue Canyon EFHCA and the steep topography of Rogue Canyon. The narrow (7 km) region between the steep canyon head and Rogue River EFHCA has massive carbonate rock, numerous methane seeps and “high-robust” coral habitat. Shoreward, Rogue River Reef EFHCA extends all the way to nearshore Rogue Reef where extensive rocky terrain occurs throughout the nearshore. Nearly the entire coast south of Rogue River (Gold Beach) is rocky reef HAPC.

The Council recommends avoiding these habitats by implementing a minimum 500 m buffer around the habitat resources in this region (rock, methane seeps, “high robust” coral habitat, EFHCAs) to protect these habitats from activities associated with cable routing (site assessment, installation, operations).

Nearshore Nursery Habitat for Fish

Cable routing will need to pass through nearshore EFH environments to landing sites and connect to the electric grid. In addition to HAPC-designated Oregon estuaries, areas of nearshore rocky reef and biogenic structure provide significant nursery habitat for a variety of Council-managed species and occur along the shorelines that border directly to the east of each WEA. Nearshore habitat details can be found in the recently completed comprehensive nearshore maps for substrate and biotic habitats compiled by the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP 2022a, b). Furthermore, nursery habitats have been documented for both hardbottom and softbottom habitats in shelf areas in proximity to the Call Areas, including for flatfishes (e.g., Toole et al 2011), rockfishes and other groundfish species (e.g., Studebaker et al 2009) and surf zone sands for Chinook salmon (e.g., Jarrin et al 2013).

The Council recommends that BOEM enlist NCCOS to support comprehensive nearshore habitat mapping in areas where cable planning may occur, and to avoid cable routing through areas identified as nursery habitat for Council-managed species.

Table 2: List of aliquots in Draft WEA A and Draft WEA B overlapping sensitive benthic habitats, recommended by the Council for removal, to protect sensitive habitats, habitat features, and the marine ecosystem.

WEA_Name	Aliquot ID	FID	WEA_Name	Aliquot ID	FID
A	NK10-01 6018D	4	B	NK10-04 6971M	415
A	NK10-01 6018F	6	B	NK10-04 6971N	416
A	NK10-01 6018H	8	B	NK10-04 7018M	439
A	NK10-01 6018I	9	B	NK10-04 7018P	442
A	NK10-01 6018J	10	B	NK10-04 7019C	445
A	NK10-01 6018L	12	B	NK10-04 7019D	446
A	NK10-01 6018M	13	B	NK10-04 7019E	447
A	NK10-01 6018N	14	B	NK10-04 7019G	449
A	NK10-01 6068F	25	B	NK10-04 7019H	450
A	NK10-01 6068G	26	B	NK10-04 7019I	451
A	NK10-01 6119M	74	B	NK10-04 7019M	455
A	NK10-01 6168P	93	B	NK10-04 7019N	456
A	NK10-01 6219J	137	B	NK10-04 7020D	462
A	NK10-01 6219K	138	B	NK10-04 7020H	466
A	NL10-10 7167P	616	B	NK10-04 7020L	470
B	NK10-04 6769K	172	B	NK10-04 7021A	475
B	NK10-04 6820M	229	B	NK10-04 7021B	476
B	NK10-04 6821G	239	B	NK10-04 7021C	477
B	NK10-04 6821H	240	B	NK10-04 7021E	479
B	NK10-04 6821K	243	B	NK10-04 7021F	480
B	NK10-04 6868H	256	B	NK10-04 7021G	481
B	NK10-04 6868L	258	B	NK10-04 7021H	482
B	NK10-04 6868P	259	B	NK10-04 7021I	483
B	NK10-04 6869A	260	B	NK10-04 7021L	486
B	NK10-04 6869M	272	B	NK10-04 7021P	490
B	NK10-04 6870A	276	B	NK10-04 7022M	500
B	NK10-04 6870B	277	B	NK10-04 7068M	522
B	NK10-04 6870E	280	B	NK10-04 7068N	523
B	NK10-04 6918D	312	B	NK10-04 7069A	526
B	NK10-04 6919K	323	B	NK10-04 7069B	527
B	NK10-04 6919L	324	B	NK10-04 7069E	530
B	NK10-04 6919P	328	B	NK10-04 7069F	531
B	NK10-04 6920K	339	B	NK10-04 7069J	535
B	NK10-04 6920N	342	B	NK10-04 7069N	539
B	NK10-04 6921D	348	B	NK10-04 7071G	564
B	NK10-04 6921J	354	B	NK10-04 7071L	569
B	NK10-04 6922A	361	B	NK10-04 7072A	574
B	NK10-04 6969A	371	B	NK10-04 7072B	575
B	NK10-04 6969E	375	B	NK10-04 7072F	578
B	NK10-04 6970E	391	B	NK10-04 7072I	580
B	NK10-04 6971B	404	B	NK10-04 7118A	592
B	NK10-04 6971F	408	B	NK10-04 7118B	593
B	NK10-04 6971I	411	B	NK10-04 7119B	597
B	NK10-04 6971J	412	B	NK10-04 7120B	601
B	NK10-04 6971K	413	B	NK10-04 7120C	602

The Council appreciates the efforts undertaken by BOEM to minimize impacts to fishing activities, habitats, and coastal communities, and we look forward to working with BOEM in the future, to continue these efforts. If you have any questions, please contact Mr. Kerry Griffin on Council Staff (Kerry.griffin@noaa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Pettinger", with a long horizontal flourish extending to the right.

Brad Pettinger
Pacific Council Chair

KFG:acl

Cc: Pacific Council Members
Mike Conroy
Susan Chambers
Correigh Greene
Scott Heppell
Arlene Merems
Lilah Isé
Necy Sumait
Ingrid Biedron

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