Portland Audubon · American Bird Conservancy · Oceana · Surfrider Foundation
Kalmiopsis Audubon Society · Cape Arago Audubon Society · Audubon Society of Lincoln City
Lane County Audubon Society · Umpqua Valley Audubon Society · Salem Audubon Society
Audubon Society of Corvallis · Rogue Valley Audubon Society · Klamath Basin Audubon Society
East Cascades Audubon Society · Redwood Region Audubon Society · Native Fish Society
Oregon Wild · Oregon Chapter of the American Cetacean Society · Coast Range Forest Watch
Oregon Shores Conservation Coalition

June 28, 2022

Dr. Whitney Hauer
Oregon Task Force Coordinator
U.S. Bureau of Ocean Energy Management

Submitted via the Federal eRulemaking Portal: http://www.regulations.gov

Re: Call for Information for Wind Energy Development on the Outer Continental Shelf (OCS) Offshore Oregon [***Docket No. BOEM-2022-0009-0001]***

Dear Dr. Hauer:

On behalf of our hundreds of thousands of members, we are writing as a group of organizations—national, regional, and local—that advocate for the conservation and sustainable management of our marine resources. Our members watch marine wildlife, recreate in coastal and ocean environments, and value healthy ocean ecosystems. We appreciate the opportunity to provide comments regarding the BOEM (Bureau of Ocean Energy Management) proposed Call Areas for future wind energy development off Oregon's coast. Collectively, our organizations have local, place-based knowledge as well as specific expertise and decades of experience in marine conservation and management. All these perspectives inform our comments.

We submitted a letter to BOEM last October to raise preliminary concerns regarding prospective Call Areas for wind energy development off Oregon's Coast. Our groups have a strong interest in the BOEM process for siting and planning wind energy installations and remain committed to engaging to offer our perspectives and expert input. BOEM has recently requested specific information regarding the Call Areas as well as onshoring. In this letter, we offer substantive and specific recommendations regarding the proposed Call Areas, reiterate outstanding concerns, and make further recommendations related to the offshore wind energy siting process.

Floating offshore wind (FOSW) energy presents Oregon with an option in the transition away from polluting fossil fuels. It represents an opportunity to address the immense and urgent challenges posed by our climate crisis, which is already impacting marine life. However, the West Coast's renowned California Current Large Marine Ecosystem (CCLME), with its rich upwelling waters, is a crucially important natural resource with significant cultural, ecological, and economic values that must be carefully considered through all phases of siting, design, operation, and eventual decommissioning of any industrial energy development projects.

We support responsibly sited FOSW development that foremost avoids, then minimizes, and then provides meaningful mitigation and compensation for impacts to ocean and coastal wildlife, habitats, ocean users and coastal communities. Responsible development of offshore wind energy should: (i) avoid, minimize, mitigate, and monitor adverse impacts on marine and coastal habitats and the wildlife that rely on them, (ii) minimize negative impacts on other ocean uses, (iii) include robust consultation with Tribal governments and communities, (iv) meaningfully engage state and local governments and stakeholders from the outset, (v) include comprehensive efforts to both avoid negative impacts to underserved communities and deliver concrete benefits to those communities, and (vi) use the best available scientific and technological data to ensure science-based and stakeholder-informed decision making. Identifying Wind Energy Areas (WEAs) in locations where they will have lower environmental impact is a critical, foundational step for responsible development.

Because of the exceptionally high ecological values of the CCLME, the non-industrialized nature of Oregon's marine environments and coast, the notoriously difficult conditions on the Pacific Ocean's outer continental shelf, and the fact that offshore floating turbines are a brand-new technology, **the highest level of analysis and a precautionary approach are needed. If the risk of harm outweighs the benefits, then a "no action" alternative should remain on the table.**

To this end, we request that BOEM

1. **Modify Oregon Call Areas** by removing the northern portion of the Coos Bay Call Area and an eastern strip along both the Coos Bay and Brookings Call Areas to avoid and minimize impacts to marine wildlife and productive habitat areas; consider deeper water areas, but with caution (pp. 1-10)
2. **Prepare a Programmatic Environmental Impact Statement (PEIS)** for Pacific Coast FOSW projects before identifying WEAs off Oregon to ensure full consideration of the high-value biological resources and oceanographic dynamics in the CCLME off Oregon (pp. 10-13)
3. **Consider Onshoring Concerns** to ascertain compatibility and consistency with Oregon's Coastal Management Program and Statewide Land Use Planning laws and to avoid and minimize impacts to nearshore coastal and estuarine resources, values and human uses *before* identifying WEAs (pp. 13-18)
4. **Consider Siting Process Recommendations** Regarding Data Gaps, Project Planning, Adaptive Management, and Compensatory Mitigation (pp. 18-25)

Each of these requests corresponds to a numbered section below. **Our main recommendations are highlighted in bold (and are often subheaders); more specific recommendations are highlighted in *blue italics*.** Figures and spatial data referenced in the text are included in appendices.

I. SPECIFIC RECOMMENDATIONS TO MODIFY OREGON CALL AREAS

We appreciate that BOEM has excluded some offshore oceanographic features well-known to create important zones of high productivity, including the Astoria Submarine Canyon, much of Heceta and Stonewall Banks, and the advective upwelling zone south of Cape Blanco. However, the proposed Coos Bay and Brookings Call Areas significantly overlap important ecological features and habitats that provide for a rich diversity of wildlife including seabirds, marine mammals, sea turtles, deep-sea coral and sponge ecosystems, and fish communities (Fig. A1). It's no surprise that these same biologically productive areas also overlap core fishing grounds of important commercial and recreational fisheries.

In this section we provide new analysis and synthesis of mapping data from multiple taxa that identify modifications that could help to further minimize environmental conflicts within the Call Areas based on the best available science. Our core recommendations for modifying the Call Areas are as follows:

CORE RECOMMENDATIONS:
Remove from further consideration for wind energy development:
—at least 20 km from the north of the Coos Bay Call Area
—at least a 15 km strip along the eastern side of both the Coos Bay and Brookings Call Areas, including the Rogue Reef
Consider deeper waters with caution, fully informed by appropriate analysis

This would help to

- **Avoid and reduce impacts to seabirds**
- **Avoid and reduce overlap with critical habitat for threatened and endangered species**
- **Avoid and reduce overlap with foraging hotspots for birds, mammals, and fish**
- **Avoid essential fish habitat conservation areas and sensitive and rare seafloor habitats including deep-sea coral and sponge ecosystems**
- **Avoid displacing core fishing grounds**

We elaborate on and justify our core recommendations below. In the next section, we also discuss the proposal to shift call areas to waters deeper than 1,300m.

Avoid and Reduce Impacts to Seabirds

The National Audubon Society, Portland Audubon, and Birdlife International have identified several coastal and marine hotspots for birdlife off the Oregon Coast. These include over 15 nearshore "Important Bird Areas" (IBAs) and two large, globally important offshore IBAs—Cape Blanco and Heceta Bank—that extend into proposed Call Areas. Nearly 100 species of birds,

including the endangered Short-tailed Albatross and other seabirds of conservation concern, come from all around the Pacific to forage in Oregon's productive offshore waters owing to upwelling of cold, nutrient-rich water and the resulting high primary productivity that forms the basis for abundant food webs.[1]

In developing Call Areas, BOEM has not yet taken concerns about seabirds into sufficient consideration. To develop substantive and specific recommendations for how to refine Call Areas and Wind Energy Areas, we conducted a multi-species seabird analysis based on the predictive density models provided in Lierness et al. (2021).[2] (Please refer to Appendix B for details.) Our analysis of seabirds, across all seasons, points to a higher abundance in the north central portion of the Coos Bay Call Area and in the eastern portion of both Call Areas, indicating that many different species use these areas for foraging during breeding, ahead of migration, as well as for wintering grounds. This analysis supports our recommendation to remove these areas from further consideration for wind energy development.

Avoid Critical Habitat for Threatened and Endangered Species and Species of Concern

Although BOEM asserts in its "Call for Information" that "*Potential impacts to multiple protected species and habitats are reduced with the 13.8 mile exclusion buffer from shore*," this statement discounts the extensive information gathered by BOEM and the State of Oregon in development of OROWindMap[3] and through the stakeholder engagement process to date that clearly documents the importance of continental shelf and slope habitat—including portions of the proposed Call Areas—to multiple Endangered Species Act (ESA)-listed species, including large whales, seabirds, and sea turtles.

Endangered Whales

The proposed Call Areas overlap important feeding areas, migratory routes, and critical habitat for several threatened and endangered cetaceans. NOAA species distribution models show that proposed Call Areas are used by endangered Blue Whales, Fin Whales, and Humpback Whales (Figs. A2-A5). The endangered western Pacific Gray Whale is also known to migrate along the U.S. West Coast.[4] Although the BOEM's Call Area notice makes no mention of Humpback critical habitat, the proposed Call Areas almost entirely overlap critical habitat for two distinct Humpback Whale populations—the endangered Central American population and the threatened Mexico population (Figs. A6- A7), both of which use these areas for foraging

[1] National Audubon Society, Important Bird Areas: https://www.audubon.org/important-bird-areas/state/oregon

[2] Leirness JB, Adams J, Ballance LT, Coyne M, Felis JJ, Joyce T, Pereksta DM, Winship AJ, Jeffrey CFG, Ainley D, Croll D, Evenson J, Jahncke J, McIver W, Miller PI, Pearson S, Strong C, Sydeman W, Waddell JE, Zamon JE, Christensen J. 2021. "Modeling at-sea density of marine birds to support renewable energy planning on the Pacific Outer Continental Shelf of the contiguous United States." Camarillo, CA: US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2021-014. 385 pp.

[3] State of Oregon, BOEM, West Coast Ocean Data Portal, OROWindMap. Available: https://offshorewind.westcoastoceans.org/ k

[4] Mate BR, Ilyashenko VY, Bradford AL, Vertyankin VV, Tsidulko GA, Rozhnov VV, Irvine LM. 2015. "Critically endangered western gray whales migrate to the eastern North Pacific." *Biol. Lett*. 11: 20150071. http://dx.doi.org/10.1098/rsbl.2015.0071

grounds.[5] The Coos Bay Call Area is of high conservation value for the Mexico distinct population and the Brookings Call Area is of high conservation value to both the Mexico and Central American distinct populations.[6]

The proposed Call Areas also partially overlap critical habitat for endangered Southern Resident Killer Whales (Figs. A8-A9).[7] Only 74 individual Southern Residents remain in this unique population made up of three different pods, or closely related family groups. The area off the central and southern Oregon coast is an important migratory corridor for two of the three Southern Resident pods (K and L). They use this area in winter and spring months when traveling between foraging hotspots off the Columbia River mouth and Northern California in search of their primary prey, Chinook salmon.

To better understand marine mammal considerations, BOEM must consult with the National Marine Fisheries Service (NMFS) to ensure offshore wind development and operations do not directly impact ESA-listed whales and are not likely to destroy or adversely modify critical habitat.

To avoid and minimize impacts to threatened and endangered marine mammals, we recommend both Call Areas be modified as described in the Core Recommendation above to avoid critical habitat for Southern Resident Killer Whales and that BOEM consider moving the Call Areas further offshore to reduce overlap with Humpback Whale critical habitat and Gray Whale migratory pathways.

Vulnerable Seabirds

Short-tailed Albatross: The proposed Call Areas overlap with foraging habitat used by the Short-tailed Albatross, a federally endangered seabird that nests on several small islands off the coast of Japan but forages widely across the Pacific including in the productive CCLME. Satellite-tagged juvenile Short-tailed Albatross documented off of southern Oregon indicate most birds spend time in the continental shelf area during the winter months and during this time there is significant overlap with the two Oregon offshore wind Call Areas (Fig. A10).[8] There is a cluster of detections in the northwest section of the Coos Bay Call Area and generally more detections in the eastern half of both Call Areas that would support our core recommendations listed at the start of this section. However, given scattered detections throughout the Call Areas, *BOEM must develop meaningful strategies to avoid and reduce impacts for this species if there is*

[5] 86 Fed Reg. 21082 (April 21, 2021).
[6] NOAA 2020. Biological Report for the Designation of Critical Habitat for the Central America, Mexico, and Western North Pacific Distinct Population Segments of Humpback Whales (*Megaptera novaeangliae*). Available: https://media.fisheries.noaa.gov/2021-04/Biological%20Report_HWCH_081420_updated_508.pdf?null=
[7] 86 Fed Reg. 41,668 (August 2, 2021).
[8] Orben RA, O'Connor AJ, Suryan RM, Ozaki K, Sato F, Deguchi T. 2018. "Ontogenetic changes in at-sea distributions of immature short-tailed albatrosses *Phoebastria albatrus*." *Endangered Species Research* 35:23-37. https://doi.org/10.3354/esr00864

overlap with WEAs. As recovery efforts for this species continue with some success, these birds may become more common in the current Oregon Call Areas increasing the chance of impacts.[9]

Marbled Murrelet: There is little data available regarding the winter distribution and behavior of the Federally- and State-threatened Marbled Murrelet, as acknowledged in the draft EA for the Humboldt WEA. Marbled Murrelets are active in hours of low light during the breeding season; if this is also true in the winter, collisions with offshore wind turbines are possible. Marbled Murrelets also experience a flightless period during molt, which may heighten their dependency upon certain areas of the ocean and increase the impacts from disturbance at this time. Therefore, this species may be vulnerable to displacement by and/or disturbance from construction and vessel activity. *We recommend BOEM support research examining Marbled Murrelet winter distribution and behavior in areas expected to be impacted by floating offshore wind development.*

Leach's Storm Petrel: Though not currently endangered, the Leach's Storm Petrel is a species of conservation concern that has experienced a 30% population decline globally over the past 50 years.[10] Oregon hosts an estimated 482,000 nesting Leach's Storm Petrels that breed on colonies on islands off the coast.[11] Almost all of the Oregon breeding population nests on islands off the south coast between Bandon and Brookings (Fig. A11). Predicted densities of Leach's Storm Petrels (from Lierness et al. 2021) off the Oregon Coast indicate spring and summer densities are highest to the west of the Brookings Call Area. This information suggests petrels nesting in southern Oregon would need to transit the Brookings Call Area regularly as they fly to their foraging grounds (depicted with black arrows on Fig. A11). On the Atlantic Coast, Leach's Storm Petrels are documented to fly long distances to forage (400-830km).[12] Foraging behaviors and distances of Pacific Coast birds may be similar but are not well understood. This species is known to be particularly vulnerable to impacts from artificial lighting and has been known to "fall out" in large numbers on lighted oil platforms in the Atlantic Ocean, apparently attracted by artificial lighting.[13] They have also been documented to "fall out" on fishing boats apparently attracted by the lights. Adams et al (2017)[14] ranks this

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[9] U.S. Fish and Wildlife Service. 2020. "Short-tailed Albatross (*Phoebastria albatrus*), 5-year review: Summary and evaluation. Anchorage, Alaska." Available at: https://www.st.nmfs.noaa.gov/Assets/nationalseabirdprogram/doc4445.pdf

[10] http://datazone.birdlife.org/species/factsheet/leachs-storm-petrel-hydrobates-leucorhous/text

[11] Naughton M, Pitkin D, Lowe R, So, K. 2007. "Catalog of Oregon Seabird Colonies," Biological Technical Publication (Report No. BTP-R1009-2007). Report by US Fish and Wildlife Service (USFWS).

[12] Hedd A, Pollet IL, Mauck RA, Burke CM, Mallory ML, McFarlane Tranquilla LA, et al. 2018. "Foraging areas, offshore habitat use, and colony overlap by incubating Leach's storm-petrels *Oceanodroma leucorhoa* in the Northwest Atlantic." *PLoS ONE,* 13(5): e0194389. https://doi.org/10.1371/journal.pone.0194389

[13] Collins SM, Hedd A, Fifield DA, Wilson DR, Montevecchi WA. 2022. "Foraging Paths of Breeding Leach's Storm-Petrels in Relation to Offshore Oil Platforms, Breeding Stage, and Year." *Frontiers in Marine Science,* 9:816659. https://doi.org/10.3389/fmars.2022.816659

[14] Adams J, Kelsey EC, Felis JJ, and Pereksta DM. 2017. "Collision and displacement vulnerability among marine birds of the California Current System associated with offshore wind energy infrastructure" (ver. 1.1, July 2017). U.S. Geological Survey Open-File Report 2016-1154, 116 pp, https://doi.org/10.3133/ofr20161154.

species as "medium" vulnerability to offshore wind collision.[15] Fledgling petrels (and other Procellarids) are most likely to be impacted by light pollution[16] and so the proximity of the Brookings Call Area to Oregon colonies is particularly concerning. Currently, there is no data on the foraging movements of the Oregon population of Leach's Storm Petrels (pers. comm. S. Stephensen, USFWS). *We recommend BOEM support a satellite tagging study to determine the movements of Leach's Storm Petrels to inform the refinement of WEAs and to develop mitigation measures to minimize impacts.*

Endangered Sea Turtles

The entire Coos Bay Call Area lies within critical habitat for critically endangered Pacific Leatherback Sea Turtles (Fig. A12). Adult Pacific Leatherbacks migrate to and forage off the coast of Oregon from nesting beaches in the western Pacific. Leatherbacks are drawn here—one of the most productive marine ecosystems of the world—to feed because the wind-driven upwelling and cool nutrient-rich waters create ideal foraging conditions with persistent concentrations of their preferred jellyfish prey.

In January 2012, NMFS designated ocean waters off Oregon *north* of Cape Blanco as critical habitat for Leatherback Sea Turtles.[17] (The description of leatherback critical habitat in the BOEM Call Area Notice, where it states critical habitat extends from Point Arena, CA to Cape Blanco, OR, is incorrect.[18]) Critical habitat extends from shore to 2,000 meters encompassing 25,004 square miles of ocean between Cape Blanco and Cape Flattery, WA.

Because Leatherback Sea Turtle populations have declined 95% over the last thirty years and recent studies show they are continuing to diminish, conserving access to critical habitat for foraging is essential to their survival, conservation, and recovery.[19]

Given the overlap of proposed Call Areas with Leatherback Sea Turtle critical habitat, we are concerned that any offshore wind leasing activities, development or operations in this turtle foraging area would adversely modify critical habitat and impact Leatherbacks. The National Marine Fisheries Service specifically identified wind energy projects in this area as an activity that may impact Leatherback prey.[20] In accordance with the Endangered Species Act (ESA section 7(a)(2)), BOEM must consult with NMFS to ensure offshore wind development and

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[15] Adams et al., 2017.

[16] Rodríguez A., and B. Rodríguez. 2002. "Attraction of petrels to artificial lights in the Canary Islands: effects of the moon phase and age class." *Ibis*: 151: 299-310.

[17] 77 Fed Reg. 4,170 (January 26, 2012).

[18] 87 Fed Reg. 25,529 (April 29, 2022).

[19] Benson SR, Forney KA, Moore JE, LaCasella EL, Harvey JT, Carretta JV. 2020. "A long-term decline in the abundance of endangered leatherback turtles, *Dermochelys coriacea*, at a foraging ground in the California Current Ecosystem." *Global Ecology and Conservation*. Vol 24 https://doi.org/10.1016/j.gecco.2020.e01371; NOAA National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service. 2020. "Endangered Species Act status review of the leatherback turtle (Dermochelys coriacea)."

[20] NOAA National Marine Fisheries Service (2012). "Final Biological Report, Final Rule to Revise Critical Habitat Designation for Leatherback Sea Turtles," p. 23. Available: https://media.fisheries.noaa.gov/dam-migration/leatherback_criticalhabitat_biological-508.pdf

operations do not directly impact Leatherback Sea Turtles and are not likely to destroy or adversely modify their critical habitat.

Furthermore, we are concerned that offshore wind energy infrastructure and construction activities may harm or "take" Pacific Leatherback Sea Turtles by impeding their migration, disturbing foraging behavior or impacting their ability to access adequate prey resources. *To avoid and minimize impacts to endangered Pacific Leatherback Sea Turtles, BOEM must develop meaningful strategies to avoid and reduce impacts in critical habitat.*

Avoid Foraging Hotspots for Birds, Fish, Marine Mammals

Call Areas overlap with areas known to host an abundance of critical prey resources—especially krill and forage fish—for seabirds, fish, and marine mammals. *BOEM should map these areas to avoid locating FOSW infrastructure in foraging hotspots.*

Moreover, the dynamic nature of the CCLME presents unique challenges for marine spatial planning. El Niños, Pacific Decadal Oscillations, or other atmospheric cycles, for example, can alter oceanographic processes and spatially shift zones of high productivity or of devastating hypoxia and thereby significantly shift foraging areas through time. Oregon's ocean has already been vulnerable to recurrent hypoxia episodes and recent marine heat waves. In addition, climate change is already shifting marine life distribution and may also alter atmospheric cycles in unknown ways.[21]

We urge BOEM to consider how these climate change impacts may cause temporary or permanent shifts in suitable habitat and foraging areas for cetaceans and seabirds, potentially altering their presence in or near the Oregon Call Areas. Sophisticated spatial modeling analysis will be needed to account for and evaluate these possible scenarios.

Avoid Sensitive and Rare Seafloor Habitats

Deep-sea coral and sponge ecosystems

BOEM Call Areas and future Wind Energy Areas should avoid areas known or likely to contain deep-sea coral and sponge ecosystems**.** Deep-sea coral and sponge ecosystems are as important to the biodiversity of our oceans as their counterparts in shallow tropical seas. Corals and sponges create a living seafloor community with three dimensional structures that form habitat for groundfish, shellfish, and other marine life. These living habitats act as a refuge from predators, nursery grounds, and feeding areas. Corals and sponges have slow growth rates on the order of millimeters per year and are known to be extremely long lived from hundreds to even thousands of years old.[22]

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[21] Garcia-Reyes ML, Sydeman, WJ, Schoeman, DS, Rykaczewski RR, Black BA, Smit AJ, Bograd SJ. 2015, "Under Pressure: Climate Change, Upwelling, and Eastern Boundary Upwelling Ecosystems," *Frontiers in Marine Science,* 2: 109. https://doi.org/10.3389/fmars.2015.00109

[22] Lumsden SE, Hourigan TF, Bruckner AW, Dorr G (eds.) 2007. "The State of Deep Coral Ecosystems of the United States." NOAA Technical Memorandum CRCP-3. Silver Spring, MD.

It is important that any offshore wind assessment, construction or operations activities avoid areas that are known to contain or likely to contain sensitive and ecologically important coral and sponge communities. Corals and sponges are highly sensitive to physical disturbance and the anchors and submarine cables used in wind energy operations would likely significantly damage these habitats. Given their slow growth rates, recovery could take hundreds of years, if at all.

The NOAA Deep-Sea Coral and Sponge Technology Program maintains an easy-to-use database that would allow BOEM to identify all of the known coral and sponge locations in the Oregon call areas.[23] *BOEM should use this information as well as readily available predictive models to identify known and likely coral and sponge communities, modify call areas to avoid coral and sponge hotspots, and then require that any offshore wind activities avoid these habitats.*[24] Detailed mapping and visual surveys (e.g. remotely operated vehicles) should be required to confirm the absence of coral and sponge communities before any construction and operation activities commence.

Figures A13 through A16 show the location of known and expected coral and sponge habitats within the Coos Bay and Brooking Call areas using data provided by NOAA. *BOEM should avoid the extensive Bamboo Coral forest at 1,130 meters in the Brookings Call Area identified by researchers with the Ocean Exploration Trust (Fig. A15).*[25]

EFHCA and HAPC

BOEM should modify Call Areas and WEAs to avoid Essential Fish Habitat Conservation Areas (EFHCAs) and Habitat Areas of Particular Concern (HAPCs). HAPCs are a subset of EFH, and they are considered high priority areas for conservation because they are important to ecosystem function, sensitive to human activities, stressed by development, or are rare. HAPCs include substrates and biogenic features associated with the hard substrate (bedrock, boulders, cobble, gravel, etc.). As the Pacific coast groundfish FMP describes: "Hard substrates are one of the least abundant benthic habitats, yet they are among the most important habitats for groundfish."

BOEM must consult with NMFS on all activities, and proposed activities, authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) including offshore wind energy leases, assessments, development, and operations.

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[23] NOAA Deep-Sea Coral Data Portal, Available: https://deepseacoraldata.noaa.gov/

[24] Poti M, Henkel SK, Bizzarro JJ, Hourigan TF, Clarke ME, Whitmire CE, Powell A, Yoklavich MM, Bauer L, Winship AJ, Coyne M, et al. 2020. "Cross-Shelf Habitat Suitability Modeling: Characterizing Potential Distributions of Deep-Sea Corals, Sponges, and Macrofauna Offshore of the US West Coast." Camarillo, CA: US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2020-021. 267 pp.

[25] See Nautilus Live Ocean Exploration Trust. "Bamboo Corals off the Oregon Coast," at: https://nautiluslive.org/album/2016/06/17/bamboo-corals-oregon-coast

The Coos Bay and Brookings Call Areas include areas designated as EFH and HAPCs in the U.S. Pacific Coast Groundfish Fishery Management Plan.[26] Figure A17 shows that the Coos Bay Call Area overlaps the southern end of the Heceta Bank EFHCA and rocky reef HAPC. It also slightly overlaps the Deepwater EFHCA off Coos Bay. The Brookings Call Area overlaps the Rogue Reef EFHCA and HAPC (Fig. A18). *We request both call areas off Oregon be modified to exclude these important rocky reef/ hard substrate HAPCs and Essential Fish Habitat Conservation Areas (EFHCA), as described in our core recommendations above.*

Avoid Displacing Core Fishing Grounds

BOEM should modify Call Areas and WEAs to avoid core fishing grounds. The productive ocean waters along the continental shelf and slope off the Oregon Coast support valuable commercial and recreational fisheries. These fisheries and the sustainable food and jobs they provide are integral to the economies and communities of the Oregon Coast and the West Coast region at large.

Figures A19 through A24 illustrate important fishing areas for commercial groundfish fisheries and Oregon shrimp trawl fisheries that overlap the proposed Call Areas. Additional fishing effort data for groundfish fisheries, salmon, crab and others can be found in the OROWindMap.[27] We incorporate those by reference, noting the Oregon Department of Fish and Wildlife (ODFW) fishing effort data in OROWindMap shows significant overlap of multiple Oregon fisheries with the proposed Call Areas.

We urge BOEM to avoid locating WEAs in core fishing grounds. Significant fishing effort displacement into new areas can have negative environmental impacts for seafloor habitats and wildlife. For example, if a WEA is authorized in the middle of a high intensity bottom trawl location, that trawl effort is likely to shift to new areas resulting in a net increase in seafloor habitat impacts. Moreover, there is concern that turbine areas may displace fishers from fishing grounds at the same time that wildlife will be displaced from foraging grounds, creating a situation where both fishers and wildlife will be crowded into smaller areas, potentially creating a new set of conflicts that need to be considered in the siting process.

BOEM should consider modifying the wind energy Call Areas to avoid high-use fishing areas by reducing their overall size and/ or shifting the Call Areas west. If BOEM proceeds with wind energy areas that overlap current fishing grounds, BOEM should work with ODFW and NMFS to analyze the amount of expected fishing effort displacement by fishery, gear type and port as a measure of potential economic impacts, and NMFS should consider how any shifts in fishing effort would impact Essential Fish Habitats.

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[26] Pacific Fishery Management Council. 2020. Pacific Coast Groundfish Fishery Management Plan. Available: https://www.pcouncil.org/documents/2016/08/pacific-coast-groundfish-fishery-management-plan.pdf/

[27] State of Oregon, BOEM, West Coast Ocean Data Portal, OROWindMap. Available: https://offshorewind.westcoastoceans.org/

Consider Deeper Waters, But with Caution

We are aware that the fishing community and Oregon lawmakers have recommended that BOEM consider moving Call Areas into deeper waters to reduce overlap with important fishing grounds.

Considering important ecological features, threatened marine mammals, biogenic habitat, some species of seabirds and existing uses in the highly productive and important continental slope depth zone, based on available spatial data (see maps in Appendix A), there appear to be fewer conflicts farther offshore, which is why we recommend removing at least 15km from the east side of the proposed Call Areas.

However, there are also at least 19 species of seabirds that have higher predicted densities in areas deeper than 1,300m in at least one season. These include: Sabine's Gull, all three jaeger species, Buller's Shearwater, South Polar Skua, Fork-tailed Storm Petrel, Northern Fulmar, Short-tailed Shearwater, Sooty Shearwater, Flesh-footed Shearwater, Black-legged Kittiwake, Black-footed Albatross, Red and Red-necked Phalaropes, Leach's Storm Petrel, Common Tern, Arctic Tern, and Heerman's Gull.[28] Three of these species are listed with the conservation status "near threatened" and two as "vulnerable" according to the IUCN. Five are considered U.S. Fish & Wildlife Service "Birds of Conservation Concern."[29] Sperm whales and Fin whales also use deeper waters, as do Pacific Albacore Tuna. If BOEM decides to consider locating Call Areas in deeper waters to reduce conflicts, a careful spatial planning approach will still be needed, including a cumulative impacts analysis and least conflicts analysis, to determine the most appropriate Call Areas and WEAs.

II. NEED FOR PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Over the past year, the Department of the Interior has announced its intent to develop multiple offshore wind projects off the West Coast, any one of which may have significant impacts on the California Current Large Marine Ecosystem (CCLME). While we appreciate the urgency to proceed with planning, we strongly urge BOEM to prepare a Programmatic EIS (PEIS) before identifying Wind Energy Areas (WEAs) in Oregon to ensure sufficient analysis and consideration is given to the many complex issues and data that should inform siting offshore renewable energy facilities. A broad constituency of stakeholders from communities up and down the West Coast have made this same sensible request.

CORE RECOMMENDATION:
Prepare a Programmatic Environmental Impact Statement (PEIS) for West Coast FOSW projects before identifying Oregon Wind Energy Areas (WEAs) to ensure full consideration of the high-value biological resources and oceanographic dynamics in the California Current Large Marine Ecosystem (CCLME) off Oregon

[28] Leirness, et al. 2021.

[29] U.S. Fish & Wildlife Service, Migratory Bird Office, 2021, "Birds of Conservation Concern, 2021." https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf

As recognized by Council on Environmental Quality (CEQ) guidance, programmatic NEPA review is appropriate when there is a "decision to proceed with multiple projects that are temporally or spatially connected and that will have a series of associated concurrent or subsequent decisions."[30] The multiple floating offshore wind projects (six projects or Call Areas now proposed off the three West Coast states, *See Fig. A25*) are "spatially connected" because they are all located within the CCLME, and multiple migratory marine species depend on different high productivity areas within this ecosystem for different phases of their lives, including several threatened and endangered species such as Blue Whales, Humpback Whales, Southern Resident Killer Whales, and Green Sturgeon, as well as the Short-tailed Albatross.

One of the key reasons we urge preparation of a PEIS before designating Call Areas and delineating WEAs is to ensure that there will be a full cumulative impacts analysis. Migratory species that travel north-south through the CCLME may encounter the impacts of not just one but several wind-energy projects, and the cumulative impacts of multiple encounters must be considered. There is also concern that turbine areas will displace fishers from fishing grounds at the same time that wildlife will be displaced from foraging grounds, creating a situation where both fishers and wildlife will be crowded into smaller areas, potentially creating a new set of conflicts that need to be fully considered in the siting process.

Moreover, BOEM has indicated there will be additional, yet to be determined, Call Areas in the future. This makes considering the "big picture" of potential impacts throughout the CCLME essential in order to avoid, minimize, and mitigate harmful impacts. Already, the proposed Humboldt Call Area and Wind Energy Area is located just 60 miles south of the Brookings Call Area, and the National Renewable Energy Lab (NREL) has identified the area between the Brookings Call Area and the Humboldt Wind Energy Area as an Area of Interest (Del Norte) for future development. If all potential areas off California plus more off Oregon and Washington are developed, impacts on wildlife throughout the CCLME could be extensive and irrevocable.

While a PEIS cannot replace site-specific analyses, there can be many benefits to a broader look at offshore renewable energy planning off the West Coast.[31] A PEIS could provide detail that leads to more informed choices among planning level alternatives (including a no action alternative), help develop broad mitigation strategies, allow for collaboration among federal, state, and local agencies as well as support meaningful consultation with impacted Tribal governments, and provide a more appropriate means for evaluating cumulative impacts than at

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[30] Council for Environmental Quality (CEQ), Memorandum for Heads of Federal Departments and Agencies: Effective Use of Programmatic NEPA Reviews, 14 (Dec. 18, 2014). Available at: https://ceq.doe.gov/docs/ceq-regulations-and-guidance/Effective_Use_of_Programmatic_NEPA_Reviews_Final_Dec2014_searchable.pdf. *See also* CEQ, *Notice of Availability, Final Guidance for Effective Use of Programmatic NEPA Reviews*, 79 Fed. Reg. 76986, 76986 (Dec. 23, 2014), p. 14, Available at: https://www.govinfo.gov/content/pkg/FR-2014-12-23/pdf/2014-30034.pdf

[31] *Id.* at 6-7 ("Programmatic analyses have value by setting out the broad view of environmental impacts and benefits for a proposed decision. . . that should result in clearer and more transparent decision-making, as well as provide a better defined and more expeditious path toward decisions on proposed actions.").

the project level stage. Moreover, a PEIS need not delay wind energy planning. Time invested early in the process to develop strategies to effectively avoid and minimize impacts will save time and costs later in the project permitting phase and ensure consistency and certainty for both communities and for developers.

Before siting WEAs and leasing offshore wind facilities along the West Coast, there must be full consultation and permitting with agencies that implement our federal wildlife and environmental laws, and consideration of a full range of issues—including impacts throughout project construction (anchoring to the seabed, sub stations, cable landings, port terminal construction, transmission line upgrades), operations and maintenance, and ultimately decommissioning.

In its *Federal Register* notice, BOEM has stated that after Oregon WEAs are designated, it will conduct a National Environmental Policy Act (NEPA) process and that, in the past, this has been an Environmental Assessment (EA) focused on site characterization activities. However, such a narrowly-construed EA will not be sufficient to fully characterize the potential impacts, to assess cumulative impacts, to conduct complex analyses, and to develop meaningful mitigation strategies for offshore wind site assessment. If BOEM decides not to conduct a PEIS for West Coast FOSW energy development, we urge BOEM to plan for preparing an Environmental Impact Statement (EIS) for Oregon WEAs—a far more appropriate analysis and process than an EA. A comprehensive Pacific offshore wind cumulative impacts analysis is a necessary component of planning regardless of which approach is taken.

A PEIS will ensure that all impacted stakeholders have sufficient detail to understand interaction among proposed OSW projects and components on the OCS of Oregon, as well as allow BOEM to make an appropriate informed choice among planning-level alternatives and to develop broad mitigation strategies. As recently noted by members of Oregon's Congressional delegation, a thorough PEIS could offer clarity on the nascent technology of FOSW in deep waters, and a means for setting forth a best course of action (including a no action scenario) considering the system as a whole.[32] Finally, conducting a PEIS before continuing the current leasing process could be a key means to ensure effective coordination between BOEM and State and local agencies, as well as meaningful consultation and co-management between BOEM and impacted Tribal nations.

[32] Oregon Senator Ron Wyden and Congressman Peter DeFazio, Letter to Amanda Lefton, BOEM, June 22, 2022. Available at: *https://defazio.house.gov/sites/defazio.house.gov/files/Defazio%20Wyden%20Letter%20to%20BOEM%20on%20Oregon%20Call%20Areas.pdf. See also: Congressman DeFazio and Senator Wyden Send Letter to Bureau of Ocean Energy Management on Oregon Coast Offshore Wind Project*, (June 22, 2022): https://www.wyden.senate.gov/news/press-releases/congressman-defazio-and-senator-wyden-send-letter-to-bureau-of-ocean-energy-management-on-oregon-coast-offshore-wind-project.

III. CONSIDER CONCERNS ABOUT ONSHORING FROM PROPOSED CALL AREAS

Oregon's nearshore marine environment and coastal zone are extremely important to the economy, ecology, and citizens of our state. According to the National Ocean Economics Program, Oregon's ocean economy is worth $3.1 billion annually and supports more than 43,000 jobs.[33] More than 25,000 of those jobs are in tourism, recreation, and fishing—the sectors that may be most impacted by siting of offshore wind farms and related infrastructure. The coast also has high conservation values, with a high percentage of the coastline in state parks and recreation areas plus the Oregon Islands National Wildlife Refuge, which contains critical habitat for over 1 million nesting seabirds and thousands of marine mammals.

A 2015 survey by DHM Research found that "the coast" is one of the things Oregonians value most about our state. More than 80% of Oregonians report visiting the coast each year for tourism, representing over $2.4 billion in expenditures from ocean recreation alone.[34] Wildlife viewing—including bird and whale watching—as well as fishing, provides important economic value–as well as enjoyment and quality of life for residents and visitors.[35] More than half of the Oregon State Park system's greater than 50 million visits occur on the coast, creating $618 million in annual state park visitor spending. In Coos Bay, Sunset Bay State Park alone provides $24 million annually, generating 382 jobs.[36]

Among the cherished shoreline resources that could be impacted by cable installation and maintenance and substation facilities to bring energy ashore are State Parks, rocky habitat areas protected under Oregon's Rocky Habitat Management Strategy, beaches that are popular sites for recreation, and vulnerable fish and wildlife habitat areas, such as estuaries, including those used by threatened coho.

To ensure that crucial economic, social, and ecological values of Oregon's Coast are effectively evaluated and conserved in the FOSW siting process, BOEM must carefully consider applicable enforceable policies of Oregon's Coastal Management Program early in the planning process to determine whether Call Areas and subsequent lease areas will be feasible in terms of their onshore components.

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[33] National Ocean Economics Program, 2019 data for all ocean sectors in coastal counties: https://www.oceaneconomics.org/Market/ocean/oceanEconResults.asp?IC=N&dataSource=E&selState=41&selCounty=41000&selYears=All&selSector=8&selIndust=AL00&selValue=All&selOut=display&noepID=unknown

[34] La Franchi, Chris and Daughtery, Collin. 2011. "Non-Consumptive Ocean Recreation in Oregon: Human Uses, Economic Impacts, and Spatial Data." Prepared for Oregon Dept. Land Conservation and Development and Oregon's Territorial Sea Plan.

[35] Dean Runyan Associates. 2009. "Fishing, Hunting, Wildlife Viewing and Shellfishing in Oregon, 2008 State and County Expenditure Estimates." Prepared for the Oregon Department of Fish and Wildlife and Travel Oregon, p. 18.

[36] Dean Runyan Associates, "Oregon Travel Impacts 2003-2020," Prepared for Travel Oregon. Available at: https://industry.traveloregon.com/research/category/economic-impact/

CORE RECOMMENDATION:
Consider onshoring early to ascertain compatibility and consistency with Oregon's Land Use planning laws and to avoid and minimize impacts to nearshore coastal and estuarine resources, values and human uses before identifying WEAs

Impacts to birds, fish, wildlife and existing ocean users associated with FOSW will occur not only within the proposed Call Areas but also within state waters (Oregon's Territorial Sea), along our coastal zones, and on land as well, with substantial construction of infrastructure to bring energy to shore, including cables, substations, onshoring facilities, and facilities to connect FOSW energy with transmission lines. In addition, upgrades to port facilities and significant dredging of harbors and estuaries may also be needed to support installation and maintenance of FOSW projects.

Oregon's Territorial Sea Plan establishes guiding principles to protect and coordinate management of these critical nearshore ocean interests including: enforceable policies, state and federal coordination, extended protections and coordination authority for Oregon's seafloor and rocky habitats, and includes a chapter on renewable energy. The state has further established a "Marine Renewable Energy Geographic Location Descriptor" (GLD) that extends federal consistency requirements to the 500-fathom contour (914 meters) in recognition of the nearshore impacts of siting offshore renewable energy.[37] It should be noted that significant portions of the proposed Call Areas fall within Oregon's Marine Renewable Energy GLD. As such, any future lease sale, site assessment, and construction and operations phases will be subject to Oregon's federal consistency review authority under the Coastal Zone Management Act.

We appreciate that BOEM has collaborated with the State of Oregon. However, the siting process should include more robust, up-front consideration of the compatibility of future WEAs within the proposed Call Areas with Oregon's laws and policies related to Coastal Zone Management, State and Local Land Use Planning, and the Territorial Sea Plan, especially for the on-shoring portion of wind energy development including laying cable, building landings, and constructing transmission lines.

We urge careful consideration of the sequencing of the federal and state processes so that projects can be evaluated in their entirety—including ocean, coastal, and terrestrial components—rather than in a piecemeal manner, which would preclude effective consideration of whole-project and cumulative impacts. This is particularly important given the existing constraints, values and uses of Oregon's ports and estuaries adjacent to the Call Areas that will need significant modifications to accommodate FOSW onshore facilities. Early

[37] Oregon Department of Land Conservation and Development Coastal Management Program, "State of Oregon Geographic Location Description: Analysis of Reasonably Foreseeable Effects of Federal Actions Related to Marine Renewable Energy Projects on Resources and Uses Occurring within the Federal Waters of the Oregon Ocean Stewardship Area." n.d. https://www.oregon.gov/lcd/OCMP/Documents/OCMP_MarineRenewable_GLD_final.pdf

engagement and strong community process is necessary to avoid and minimize impacts to nearshore coastal and estuarine resources, to protect human uses and values, and to support appropriate identification of WEAs and associated onshoring.

If BOEM proceeds with decisions about Call Areas and WEAs without sufficient consideration of onshoring aspects of wind energy development—and how they will or will not be compatible with the enforceable policies of Oregon's Territorial Sea Plan, Coastal Management Program and State Land use laws— serious obstacles may arise later in the process, after a great deal of time and money has been invested and at a point when it will be far more difficult to make adjustments to avoid and minimize impacts.

For example, seafloor habitat areas, nearshore resources, and human uses protected under Oregon's Territorial Sea Plan and State Land Use Law (Goal 19) will need to be considered in a State Land Use Law context. Impacts to wildlife, such as marine mammals, seabird nesting and foraging areas—including those used by the state and federally threatened Marbled Murrelet, found inland from the Coos Bay Call Area— will also have to be considered in a State Land Use Law context (Goal 5), as well as a federal context. Activity in Oregon ports and estuaries must also comply with the enforceable policies of Oregon's Coastal Management Program, key coastal Statewide Land Use Goals (Goals 16, 17, 18, and 19), Section 401 of the Clean Water Act (implemented by Oregon), and the Oregon Conservation Strategy, among other state laws.

Leasing in federal waters will trigger an extensive and complex federal consistency process that will demand significant time, resources, and capacity from the State of Oregon. We urge BOEM to allow ample time to ensure meaningful coordination, consistent with 43 U.S.C. 1337(p)(8), between the Bureau and the State of Oregon. This will ensure that the State has time to expand capacity to better manage the State's process and public engagement in this process.

In delineating Wind Energy Areas, BOEM must ensure that onshoring facilities are sited to avoid impacting extremely valuable coastal wildlife habitat, recreational areas, and viewsheds in Oregon's coastal zone.

Because we are concerned about conserving extremely valuable wildlife habitat and recreational areas in our coastal zone, we urge BOEM to consider specifically how infrastructure and activities associated with onshoring energy from proposed Call Areas will affect these important values early in the siting process.

For the proposed Brookings Call Area, these include but are not limited to:

- the estuaries of the Winchuck, Chetco, Pistol and Rogue Rivers, plus Myers and Hunter Creeks, some of which are state-designated as "natural" and which provide habitat for threatened Southern Oregon-Northern California Coast Coho[38]

[38] NOAA National Marine Fisheries Service. 2014. "Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (*Oncorhynchus kisutch*)" National Marine Fisheries Service. Arcata, CA.

- Oregon State Parks and Recreation Areas, including Crissey Field, Winchuck State Recreation Area, McVay Rock, Harris Beach State Park, Samuel H. Boardman Scenic Corridor and State Park units within it, Pistol River State Park, Cape Sebastian State Park, Otter Point State Park
- Viewsheds of these State Parks, which include areas identified as both "Territorial Sea Plan (TSP) Special Area Viewsheds" and "TSP Scenic Class viewsheds," as mapped by OROWIND (TSP VISUAL RESOURCE MANAGEMENT maps)
- the Oregon Coast National Wildlife Refuge Complex, including dozens of offshore islands, as well as some important headlands, with sensitive seabird breeding and roosting habitat as well as haul out and breeding habitat for marine mammals, including critical habitat for Steller Sea Lions[39]
- State designated Rocky Intertidal Areas, including Lone Ranch Beach, Harris Beach Recreation Area, Winchuck Beach, as well as popular beaches used for recreation including Sport Haven Beach, Myers Creek Beach, the beach at Gold Beach and at Otter Rock State Recreation Area[40]
- Important Bird Areas: Goat Island, Whalehead Island NWR and Mack Reef[41]
- Designated Rocky Habitat Management sites, including Brookings Research Reserve, Harris Beach Marine Garden, and the Pyramid Rock no-take area[42]
- Proposed critical habitat for threatened Marbled Murrelets[43] and for threatened Silvery Phacelia[44]
- Oregon Redwoods, Rogue River-Siskiyou National Forest

For the proposed Coos Bay Call Area, these include but are not limited to:

- the estuaries of Coos Bay, the Umpqua River, Siltcoos River, and Tenmile, Tahkenitch, and Eel Creeks, some of which includes critical habitat for threatened southern DPS of Pacific Eulachon[45], for the southern DPS of Green Sturgeon[46] and for Oregon Coast Coho[47]

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[39] NOAA, Steller Sea Lion Critical Habitat: https://media.fisheries.noaa.gov/dam-migration/stellersealion_ch_or_ca.pdf

[40] Oregon Parks and Recreation Department, Rocky Intertidal Areas: https://stateparks.oregon.gov/index.cfm?do=main.loadFile&load=_siteFiles/publications/43485 Oregons Rocky Intertidal Areas.pdf

[41] https://www.audubon.org/important-bird-areas/state/oregon

[42] Oregon, Management Designations for Marine Areas: https://www.eregulations.com/oregon/fishing/management-designations-for-marine-areas

[43] US F&WS, Proposed Marbled Murrelet Critical Habitat: https://ecos.fws.gov/ecp/species/4467

[44] US F&WS, Proposed Silvery Phacelia Critical Habitat: https://www.regulations.gov/document/FWS-R1-ES-2021-0070-0001

[45] NOAA NMFS, Eulachon, Southern DPS, Critical Habitat: https://media.fisheries.noaa.gov/2022-05/ch_2021mapseries_Eulachon_SouthernDPS.jpg

[46] NOAA NMFS, Green Sturgeon, Southern DPS, Critical Habitat: https://media.fisheries.noaa.gov/2022-05/ch_2021mapseries_SturgeonGreen_SouthernDPS.jpg

[47] NOAA NMFS, Oregon Coast Coho: https://media.fisheries.noaa.gov/2022-05/ch_2021mapseries_SalmonCoho_OregonCoastESU.jpg

- Oregon State Parks and Recreation Areas, including Seven Devils State Recreation Area, Cape Arago State Park, Shore Acres State Park, Sunset Bay State Park, Yoachim Point State Park
- Viewsheds of these parks, which include areas identified as both "Territorial Sea Plan (TSP) Special Area Viewsheds" and "TSP Scenic Class viewsheds," as mapped by OROWIND (TSP VISUAL RESOURCE MANAGEMENT maps)
- the Oregon Coast National Wildlife Refuge complex, including dozens of offshore islands, as well as some important headlands, with sensitive seabird breeding and roosting habitat as well as haul out and breeding habitat for marine mammals
- the Oregon Dunes National Recreation Area including its viewsheds
- Proposed Critical habitat for the threatened Marbled Murrelet[48], the threatened Western Snowy Plover[49], and the threatened Pacific Marten, Coastal DPS[50]
- Western Snowy Plover State HCP Designated Management Areas: Coos Bay North Spit, Tenmile, North Jetty Umpqua River, Tahkenitch South[51]
- Important Bird Areas: Coos Estuary, Umpqua River Estuary, Tahkenitch Creek Estuary, Siltcoos Lake (and estuary), and Siuslaw River Estuary. These areas host tens of thousands of migratory shorebirds, waterfowl, and other bird species in the spring and fall.[52]
- State designated Rocky Intertidal Areas including Five Mile Point, Cape Arago State Park, Sunset Bay State Park, as well as popular beaches used for recreation, including Merchant's Beach, Lighthouse Beach, and Bastendorff Beach County Park[53]
- Designated Rocky Habitat Management sites, including Cape Arago Research Reserve and Gregory Point Research Reserve[54]

These widely recognized valuable coastal resources are located onshore latitudinally due East from the proposed Call Areas. Depending on the actual onshoring facilities, there may be additional valuable coastal resources at other locations that will need consideration.

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[48] US F&WS, Proposed Marbled Murrelet Critical Habitat: https://ecos.fws.gov/ecp/species/4467
[49] US F&WS, Snowy Plover Critical Habitat: https://databasin.org/maps/new/#datasets=f2b697689453493297c81c5765bf0999
[50] US F&WS, Proposed Pacific Marten, Coastal DPS, Critical Habitat: https://www.federalregister.gov/documents/2021/10/25/2021-22994/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-the-coastal
[51] Oregon Parks & Recreation Department, 2019 Annual Compliance Report of The Habitat Conservation Plan For The Western Snowy Plover, 4: https://www.oregon.gov/oprd/PCB/Documents/OPRD_WSP_HCP_2019_AnnualReportFinal_red_web.pdf

[52] https://www.audubon.org/important-bird-areas/state/oregon
[53] Oregon Parks and Recreation Department, Rocky Intertidal Areas: https://stateparks.oregon.gov/index.cfm?do=main.loadFile&load=_siteFiles/publications/43485 Oregons Rocky Intertidal Areas.pdf
[54] Oregon, Management Designations for Marine Areas: https://www.eregulations.com/oregon/fishing/management-designations-for-marine-areas

Ocean-based recreation makes a significant economic contribution to the State of Oregon and rural coastal economies and must be evaluated to effectively inform spatial planning for FOSW projects. See recommendations below regarding specific data gaps that must be filled to inform spatial planning.

IV. SITING PROCESS RECOMMENDATIONS

In addition to providing specific input regarding the proposed Call Areas, we must express concerns and reservations about BOEM's FOSW energy siting process and make some constructive recommendations.

Siting will be the single most significant decision made in planning for successful wind energy projects. Appropriate siting can avoid and minimize impacts on birds, fish, and wildlife, and reduce associated conflicts in the planning process. However, it requires data collection and analysis *before* making decisions on Wind Energy Area (WEA) locations. For this reason, it's imperative that BOEM provides sufficient time to gather data and conduct analyses necessary to make the most informed decisions possible.

We appreciate that BOEM has collaborated with the State of Oregon and has endeavored to engage organizations up and down the coast, and we urge BOEM to continue to provide opportunities for public and scientific input in the siting and planning process to better inform offshore wind energy development before leasing. But we remain concerned that timing of the current BOEM process does not allow for all steps of data gathering, gap analysis, data evaluation and analysis, and planning to be completed before WEAs are identified.

CORE RECOMMENDATION:
Allow adequate time to gather data and to conduct analyses and engagement needed to make informed decisions possible

Ideally, the siting process would first identify important areas to be avoided for ecological, cultural, and social reasons, and then present a synthesis of findings that would point to clear, scientifically and socially supported conclusions about the most appropriate locations for renewable energy facilities that could inform project planning. A good model for this kind of informed and transparent process is the one that the State of Oregon followed in its Territorial Sea Planning process (Part 5) for siting marine renewable energy projects.[55]

The importance of siting decisions cannot be overstated. Areas being considered for wind energy development in the globally significant California Current Large Marine Ecosystem (CCLME) are exceptionally productive and are crucial for a wide range of ecosystem services. The value of these areas extends far beyond the Call Area footprint. For example, salmon that

[55] State of Oregon, Territorial Sea Plan, Part Five, Marine Renewable Energy Development, 2019: https://www.oregonocean.info/index.php/tsp-home/123-territorial-sea-plan-part-5-marine-renewable-energy-development-2

migrate through and forage inside the Call Areas ultimately support nutrient transfer to forest ecosystems from the Coast Range to the upper Columbia Basin. In addition, consistent summer upwelling—which may be affected by wind energy operations[56]—fuels everything from the base of the marine food web to fog drip that nourishes terrestrial coastal forests, including the renowned redwoods of Oregon's south coast, which lie east of the Brookings Call Area.[57]

Identify and Address Data Gaps

We are concerned that significant data gaps remain that will make it difficult to make informed decisions about siting of West Coast projects. Existing studies regarding impacts of offshore wind energy development on seabird, fish, and marine mammal populations in the North Sea and Atlantic Ocean may not be directly transferable to species and conditions in the CCLME, and very little information is available regarding the effects of floating infrastructure on marine habitat and species.

There are several key studies now underway that will provide essential information to better refine Call Areas including baseline data collection for cetaceans, revised Biologically Important Areas for cetaceans, additional baseline data regarding seabird distribution and abundance, and the Oregon Department of Energy's study on integrating offshore wind into the state "grid," which will have ramifications for onshoring aspects of energy development. All of these resources will be crucial to help to identify WEAs of least conflict and impact and should be considered.

To better address data gaps, we encourage BOEM to consult early and often with other federal and state agencies that have expertise and responsibilities for birds, fish, wildlife and other considerations, such as oil spills, in the marine environment. There is a need for a regional approach to address broader issues that span the entire CCLME, including impacts to species that migrate through the ecosystem, and shifts in oceanographic processes and distributions of species related to climate change.

Marine Mammals

BOEM must consider that baseline data for many cetacean species off the Oregon Coast is extremely limited, particularly for small whale species and in the winter and spring seasons. We caution that currently identified Biologically Important Areas (BIAs) for cetaceans should be supplemented with additional data and information and that the National Marine Fisheries Service is currently updating BIAs.[58] Moreover, much is still unknown about how large whales—particularly baleen whales—use Oregon waters and how their distribution changes in response

[56] Raghukumar et al. 2022.

[57] Hocking MD, Reimchen TE. 2002, "Salmon-derived nitrogen in terrestrial invertebrates from coniferous forests of the Pacific Northwest," *BMC Ecology*, 2:4; Johnson JA, Dawson TE. 2010. "Climatic context and ecological implications of summer fog decline in the coast redwood region," *Proceedings of the National Academy of Sciences,* 10: 4533-4538; Fahel A, Archer, CL. 2020. "Observed onshore precipitation changes after installation of offshore wind farms," *Bulletin of Atmospheric Science and Technology*, 1: 179-203.

[58] BIAs are currently undergoing revision and are expected to be updated this year: See https://oceannoise.noaa.gov/biologically-important-areas

to changing ocean conditions. Preliminary density models have been developed for some whale species, and a new analysis of distribution and oceanographic conditions has described some high-use areas for Humpback Whales, Blue Whales, and Fin Whales.[59] However, habitat-based density models need sustained input from field data to ensure validation and robust predictive power. In addition, habitat models are difficult to create for rare or highly endangered species that use state and federal waters off Oregon's coast, including North Pacific Right Whales and Southern Resident Killer Whales. *We urge BOEM to support continuing research on marine mammal use of the proposed Oregon Call Areas to better inform wind energy planning.*

Seabirds

We are also concerned that insufficient data is available to adequately consider avian use of the Call Area or assess impacts associated with development and operation of offshore wind facilities. Modeling does not include sufficient raw data to adequately consider avian use of offshore areas in winter or to determine important foraging grounds. For example, the wintering distribution of the ESA-listed Marbled Murrelet is poorly understood. In Oregon, these birds may use waters further offshore, potentially including the offshore wind planning area. Knowledge of foraging grounds will be especially important for dynamic soaring seabirds (albatrosses and shearwaters) as well as for breeding birds that generally remain close to breeding colonies during the breeding season, but that may be compelled to travel farther afield to deeper waters if marine heat waves impact nearshore foraging opportunities. The need to document flight paths to potential foraging areas may be particularly important for obligate burrow nesters, such as Leach's Storm Petrels and Tufted Puffins, which have limited opportunities to change their breeding sites.

In addition, we are concerned that the aerial survey results from the Pacific Continental Shelf Environmental Assessment (PaCSEA) are not adequate to draw conclusions about less abundant species or to identify pattern shifts in response to anomalous ocean conditions. Tracking and radar studies are needed to develop better understanding of species of greater abundance as well as migratory pathways and habitat used by less-studied, smaller and rare marine birds in the area, such as murrelets.

In addition, a study should be conducted to better understand avian species and locations within the Call Area for which displacement effects are already known to be a risk. Existing studies indicate where some species may congregate during migration and in winter, but because these studies entail infrequent field surveys, it is critical to develop more granular

[59] Becker EA, Forney KA, Miller DL, Fiedler PC, Barlow J, Moore JE. 2020. "Habitat-based density estimates for cetaceans in the California Current Ecosystem based on 1991–2018 survey data." US Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-638; Derville S, Barlow DR, Hayslip C, Torres LG. 2022. "Seasonal, Annual, and Decadal Distribution of Three Rorqual Whale Species Relative to Dynamic Ocean Conditions Off Oregon, USA." *Frontiers in Marine Science*. 9:868566.https://doi.org/10.3389/fmars.2022.868566; U.S. Department of the Navy. 2018. "U.S. Navy Marine Species Density Database Phase III for the Northwest Training and Testing Study Area." NAVFAC Pacific Technical Report. Naval Facilities Engineering Command Pacific, Pearl Harbor, HI. 258 pp.

location data. A tracking study should be conducted for one or more species that are vulnerable to displacement and found in the Call Area in substantial numbers.

Trans-Pacific migrants also warrant more attention. Nearly 100 species birds migrate across the Pacific to forage in Oregon waters. Studies should be conducted to better understand the prevalence, magnitude, and patterns of trans-Pacific bird migration, and how this may intersect with the Oregon Call Areas. We suggest that this include multiple components: (1) a weather radar study to broadly assess bird migration in the vicinity of the coast, similar to studies conducted for Atlantic species [60,61], and (2) a tracking study focused on one or more species representative of guilds likely to be vulnerable to impacts from offshore wind development. When this information has been incorporated in offshore wind spatial planning, at-sea radar studies using portable units should be conducted to more fully evaluate the presence, movement patterns, and potential impacts to these species.

We urge BOEM to support multi-species radar tracking studies, in conjunction with lidar technology attached to buoys, as soon as possible to provide useful baseline data for proper siting of wind farm arrays off Oregon. At a minimum, we recommend tracking studies for birds with likely vulnerabilities: Short-tailed albatross, Shearwaters, Marbled Murrelets, and Leach's Storm Petrels.

Offshore wind energy planning on the Atlantic coast has been informed by a suite of studies funded by BOEM, conducted in collaboration with USFWS, universities, and other partners. These studies entailed relatively large samples and extensive efforts to understand the presence, abundance, and movements of key bird species and guilds in offshore wind energy areas (e.g., ESA-listed species, diving birds vulnerable to displacement, shorebirds).[62] A similarly robust effort is needed on the Pacific coast to better inform FOSW planning.

Oceanographic and Atmospheric Processes

Concerns have been raised about the impact of wind reduction in the wake of offshore turbine arrays to wind-driven upwelling.[63] Given the importance of upwelling to marine life in the CCLME, protecting the underlying oceanographic processes, patterns, and features that promote this enhanced biological productivity will be crucial. More research and analysis are needed to clarify the impacts of wind-reduction wakes caused by FOSW infrastructure to primary productivity in the marine ecosystem as well as to our region's unique fog and precipitation patterns. *We urge BOEM to conduct the analysis and modeling needed to fully assess wind-generated impacts to our valuable marine and nearby terrestrial forest ecosystems and to related human uses.*

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[60] Buler et al. 2017. "Validation of NEXRAD data and models of bird migration stopover sites in the Northeastern U.S." Submitted to U.S. Fish and Wildlife Service, Northeast Region: Hadley, MA.

[61] Northeast Conservation Planning Atlas. 2018. Northeast stopover sites for migratory landbirds. January 30, 2018 (last modified April 9, 2018). Available at: https://nalcc.databasin.org/galleries/f5cc97e920ec49dfb76bc039a53c3e0a/#expand=159202

[62] See Birds and Bats section at https://www.boem.gov/renewable-energy-research-completed-studies

[63] Raghukumar et al., 2022.

Ocean and Coastal Recreation Resources

Because recreational resources have not yet been considered in the siting process, we urge BOEM to conduct the following studies to ensure that impacts to the Oregon Coast's recreational and scenic resources are avoided and minimized. *We encourage BOEM to conduct an early viewshed analysis,* with visualizations under multiple build-out scenarios. This could help inform adaptive scenarios for Call Area considerations based on project impacts.

We also urge BOEM to conduct an onshore landings and nearshore infrastructure impacts analysis and to collaborate with the State of Oregon on a spatial planning process already in progress for nearshore areas. In particular, *we strongly urge BOEM to limit the number of onshoring sites* to minimize the proliferation of industrial infrastructure and help assure that valued coastal scenic and recreational resources are not degraded.

To better inform siting of onshoring facilities, *we also request that BOEM conduct an ocean recreational use* study to analyze the spatial and economic interests of the recreational and coastal tourism industry with respect to wind energy. The data currently being used is from a study conducted by Surfrider Foundation in conjunction with the State of Oregon as part of the State's Territorial Sea planning process more than 10 years ago. Since that time, there has been a major boom in recreation and tourism along Oregon's coast and within our ocean.

In addition, *we urge BOEM to model impacts to Oregon's nearshore beaches and ocean recreation.* Because studies modeling full-scale buildout of wind farms have demonstrated atmospheric and oceanic circulation impacts in the wake of these farms[64], the physical impacts of full-scale buildout for Call Area scenarios—including wind and wave shadowing and sedimentation and beach profiling—should be modeled to understand impacts to nearshore circulation and the shoreline as it relates not only to ecology but also to recreation. These human recreational uses were not identified nor planned for in any of BOEM's Call Area considerations, and modeling these impacts early for siting Call Areas and WEA is critical to avoiding unintended consequences to existing nearshore uses.

Develop a Comprehensive Coastwide Monitoring and Adaptive Management Plan

Additionally, we call for BOEM to commit to the development of a comprehensive coastwide monitoring and adaptive management plan.[65] With an adaptive management framework incorporated into the permitting process, BOEM will be able to better account for the current uncertainty of bird and wildlife responses to offshore wind projects and to learn from management actions.

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[64] Raghukumar K, Chartrand C, Chang G, Cheung L, Roberts J. 2022. "Effects of floating offshore wind turbines on atmospheric circulation in California." *Frontiers in Energy Research*, 01 June 2022. https://doi.org/10.3389/fenrg.2022.863995

[65] Williams, BK. "Adaptive management of natural resources--framework and issues," 2011, *Journal of Environmental Management,* 92(5):1346-53.

Undertaking a comprehensive adaptive management approach for offshore wind development in the Pacific will require BOEM, wind energy developers, other federal agencies, and State partners to dedicate sufficient time, resources, and flexibility in between installment of individual projects to monitor, analyze, and adapt new methods based on measured impacts. Ideally, this will allow for sharing of lessons learned in siting, mitigation, and post-construction monitoring. This would reduce uncertainty for subsequent projects and increase the likelihood of their success.

For agencies to adaptively manage turbine arrays into the future there needs to be a robust process to incorporate and integrate new scientific information. Post-construction collision and entanglement monitoring will be important to minimize impacts to birds, fish, and wildlife and to adaptively manage facilities. However, evaluation of such data will depend on gathering sufficient and meaningful baseline data, as well as developing adequate methodologies and a monitoring plan for the turbine array's projected life cycle from the very start of project permitting and development. Oregon's vital marine resources demand an excellent and transparent system for monitoring and tracking so that agencies will be well prepared to manage wind energy facilities adaptively into the future. *We urge BOEM to develop a comprehensive monitoring and tracking program for Pacific Coast FOSW projects to plan for effective adaptive management in the future.*

Anticipate and Plan to Avoid and Minimize Impacts from FOSW Infrastructure Projects
Because the BOEM siting process does not provide an opportunity to raise, fully consider, and evaluate impacts of FOSW projects until long after leasing occurs, it's imperative to raise, anticipate and consider these impacts early—in a preliminary manner at least (e.g. as part of a PEIS)—to ensure it will be possible for steps to be taken to avoid and minimize harmful impacts from predictable future construction and operation activities. If these impacts cannot be sufficiently avoided or minimized through project planning, then BOEM must consider different sites or a "no action" alternative. Here are some preliminary concerns and recommendations:

<u>Project Planning</u>
It will be important for developers and regulators to design turbine arrays to minimize impacts to birds, fish and other animals that migrate to or through state and federal waters off Oregon on a regular basis. There is little data and knowledge on how marine mammals, particularly large whales, will respond to the permanent introduction of physical structures, such as mooring lines and cables resulting from floating offshore wind development. It is possible that construction of these facilities in the marine environment could result in permanent habitat displacement, keeping large marine mammals from important foraging, mating, rearing, or resting habitats, or from vital movement and migratory corridors. Additional potential impacts include disturbance and risk of collision from vessels; entanglement in floating infrastructure or marine debris snagged on FOSW infrastructure; increased noise from project-related operations and vessel traffic; changes to water quality; and unknown impacts from electro-magnetic fields

(EMFs) generated by turbine arrays and cables.[66] *BOEM should take a precautionary approach that considers all these potential impacts in identifying and selecting development sites that minimize environmental impacts.*

Several of the long-lived species of seabirds, with limited annual reproductive capacity, may be especially vulnerable to collision or displacement in their repeated back and forth migrations through wind turbine installations. A preliminary vulnerability assessment by Kelsey et al. (2018) considering 81 species of seabirds, suggests that pelicans, terns, gulls, and cormorants are at greatest risk of collision with FOSW infrastructure, while alcids, terns, and loons face the greatest risk from displacement owing to FOSW infrastructure.[67] Dynamic soaring seabirds, such as albatross and shearwaters that rely on wind currents for their gliding flight, are another group of birds uniquely vulnerable to collision with wind energy infrastructure. *BOEM should take a precautionary approach that considers these vulnerabilities in identifying and selecting development sites that minimize environmental impacts.*

Ship disturbance

Ship disturbance to seabirds is also of concern in and around offshore wind installations. While species-specific responses are not well understood for all seabirds, documented responses to approaching vessels include flying or diving and increased alertness. These responses can result in increased energy expenditure, displacement, and habitat loss. For example, in the German North Sea, a joint effect of offshore wind installations and ship traffic together has been identified as causing a greater reduction in loon abundance than wind installations alone.[68] A primary reason for concern over these responses is that prey of many seabirds is unevenly distributed in marine habitats under even the best of conditions. Increased ship traffic in foraging areas during turbine transit, construction and maintenance could cause seabirds to use more energy during ship avoidance and also prevent them from accessing prey, leading to reductions in survival or reproductive success.

Off the coast of the Pacific Northwest, Marbled Murrelets are highly susceptible to ship disturbance.[69] This species forages in the nearshore, where they can be disturbed as ships come and go from port harbors. As areas are developed for FOSW, low disturbance and disturbance free zones could be created as mitigation for increased ship traffic in strategic areas. Spatial and temporal coordination of ship traffic should also occur when designating new ship traffic

[66] Farr et al., 2021, "Potential environmental effects of deepwater floating offshore wind energy facilities," *Ocean and Coastal Management*, 207: 105611.
[67] Kelsey EC, Felis JJ, Czapanskiy M, Pereksta DM, Adams J. 2018. "Collision and displacement vulnerability to offshore wind energy infrastructure among marine birds of the Pacific Outer Continental Shelf." *Journal of Environmental Management*. 227: 229-247.
[68] Mendel B, Schwemmer P, Peschko V, Müller S, Schwemmer H, Mercker M, Garthe S. 2019. "Operational offshore wind farms and associated ship traffic cause profound changes in distribution patterns of Loons (Gavia spp.)." *Journal of Environmental Management*, *231*, 429–438. https://doi.org/10.1016/j.jenvman.2018.10.053
[69] Marcella TK, Gende SM, Roby DD, Allignol A. 2017. "Disturbance of a rare seabird by ship-based tourism in a marine protected area." *PLOS ONE*, 12(5), e0176176. https://doi.org/10.1371/journal.pone.0176176

routes. Some seabird species may be able to habituate to ship traffic if routes are consistent and take seasonal changes in distribution into account.

Additionally, certain life history traits may increase the vulnerability of some species to ship traffic. For example, the Marbled Murrelet experiences a complete prebasic molt during the late summer into fall when birds become flightless for up to two months. Individuals have higher energy requirements during this time and are thought to have an increased vulnerability to disturbance.[70] A ship traffic disturbance vulnerability index similar to one created for European seabirds can take into account species-specific traits and should be created for Oregon's marine birds to assist with mitigation and planning. *BOEM should conduct a ship disturbance vulnerability for seabirds and other marine animals, as well*.[71]

Light pollution

Attraction of seabirds to the artificial lights associated with offshore wind installations is an additional understudied concern. Attraction and mortality of seabirds at various offshore lighting sources has been well documented.[72] Procellariforms that are nocturnal foragers, such as storm-petrels, forage on bioluminescent prey and are naturally attracted to lights. Leach's Storm Petrels are particularly vulnerable to "falling out" attracted to bright lights. For migrating birds, documented mortalities around offshore obstacles increase during periods of poor weather,[73] which are common off Oregon's coast.

Ecological light pollution is a concern well beyond seabirds. Light pollution impacts have been demonstrated in over 200 species, representative of every taxon. Most biological systems on earth evolved under regular light/dark cycles, and have carefully tuned circadian rhythms that are driven by natural lighting regimes. Artificial light is unlike natural light in its spectral properties, intensity, and timing. Research on ecological light pollution in marine environments is showing that marine life is sensitive to artificial light, even at extremely low levels.[74] Ecological light pollution from coastal development, shipping, and offshore infrastructure could already be changing the composition of marine epifaunal communities.[75]

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[70] Thiel M, Nehls G, Bräger S, Meissner J. 1992. "The impact of boating on the distribution of seals and moulting ducks in the Wadden Sea of Schleswig-Holstein." Publication Series. Netherlands Institute for Sea Research (NIOZ). https://www.vliz.be/nl/imis?module=ref&refid=53568

[71] Fliessbach KL, Borkenhagen K, Guse N, Markones N, Schwemmer P, Garthe S. 2019. "A Ship Traffic Disturbance Vulnerability Index for Northwest European Seabirds as a Tool for Marine Spatial Planning." *Frontiers in Marine Science*, 6. https://www.frontiersin.org/article/10.3389/fmars.2019.00192

[72] Rich C, Longcore T. 2013. *Ecological Consequences of Artificial Night Lighting*. Island Press.

[73] Wiese FK, Montevecchi WA, Davoren GK, Huettmann F, Diamond AW, Linke J. 2001. "Seabirds at Risk around Offshore Oil Platforms in the North-west Atlantic." *Marine Pollution Bulletin*, 42(12), 1285–1290. https://doi.org/10.1016/S0025-326X(01)00096-0

[74] Smyth, TJ, Wright, AE, McKee, D, Tidau S, Tamir R, Dubinsky Z, Iluz D, Davies TW. 2021. "A global atlas of artificial light at night under the sea." *Elementa: Science of the Anthropocene* 9(1). https://doi.org/10.1525/elementa.2021.00049

[75] Davies TW, Coleman M, Griffith KM, Jenkins SR. 2015. "Night-time lighting alters the composition of marine epifaunal communities." *Biol. Lett.***11:** 20150080. http://doi.org/10.1098/rsbl.2015.0080

Some research has been done to investigate the response of seabirds and other wildlife to different types of lighting, but *BOEM should prioritize more work to identify both species-specific and broader, ecosystem-based recommendations to minimize impacts from project lighting*.[76]

Develop a Plan for Compensatory Mitigation

In planning for wind energy project siting and operations, BOEM should foremost avoid and then minimize harm to ocean and coastal wildlife, but ultimately, significant number of birds and marine mammals will be impacted by offshore wind energy facilities in Oregon through collisions with turbines, noise and activity associated with development and operation, and displacement from areas of use. Compensatory mitigation should be provided to offset these losses—particularly for species of conservation concern and for those impacted in greater numbers.

We recognize that the agencies are still in a very early stage of planning. However, given that a regulatory framework must be identified and a process developed to provide appropriate compensatory mitigation for wildlife, it's important for BOEM to recognize and start addressing this issue now. Developing meaningful compensatory mitigation for wildlife takes time from initial concept, through planning and implementation, to success—particularly for long-lived and slow-reproducing species such as seabirds. The costs of compensatory mitigation should be considered as part of project planning and feasibility. For these reasons, we urge the agencies to begin planning for the compensation portion of the mitigation hierarchy (avoid, minimize, compensate) now, as part of the full process of considering offshore wind development.

CONCLUSION

Oregon has exceptional marine natural resources with tremendous ecological, economic, and cultural values. These cherished values demand a thoughtful and rigorous approach to siting offshore wind facilities. We hope you will consider our substantive specific recommendations and input regarding the proposed Call Areas and our general recommendations about how to improve the siting process moving forward. We thank you for considering our comments and request that BOEM include them as part of the public record.

Sincerely,

Joe Liebezeit, Staff Scientist & Avian Conservation Manager
Portland Audubon

Ann Vileisis, President
Kalmiopsis Audubon Society

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[76] Rodríguez A, Dann P, Chiaradia A. 2017. "Reducing light-induced mortality of seabirds: High pressure sodium lights decrease the fatal attraction of shearwaters." *Journal for Nature Conservation*, 39, 68–72. https://doi.org/10.1016/j.jnc.2017.07.001

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Charlie Plybon, Oregon Policy Manager
Surfrider Foundation

Phillip Johnson,
Executive Director
Oregon Shores Conservation Coalition

Paul Engelmeyer
Tenmile Creek Sanctuary Manager
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Harv Schubothe, President
Cape Arago Audubon Society

Dawn Villaescusa, President
Steve Griffiths, Conservation Chair
Audubon Society of Lincoln City

Diana Wales, President
Umpqua Valley Audubon Society

David Harrison, Conservation Chair
Salem Audubon Society

Dave Mellinger, Co-President
Jim Fairchild, Conservation Chair
Audubon Society of Corvallis

Debra Schlenoff, Conservation Chair
Lane County Audubon

Erin Ulrich, President
Rogue Valley Audubon Society

Darrel Samuels, President
Klamath Basin Audubon Society

Gail Kenny, President
Redwood Region Audubon Society

Mary Shivell, President
East Cascades Audubon Society

Mark Sherwood, Executive Director
Native Fish Society

Joy Primrose, Oregon Chapter President
American Cetacean Society

Danielle Moser, Wildlife Coordinator
Oregon Wild

Max Beeken, Co-director
Coast Range Forest Watch

APPENDIX A: FIGURES REFERENCED IN TEXT

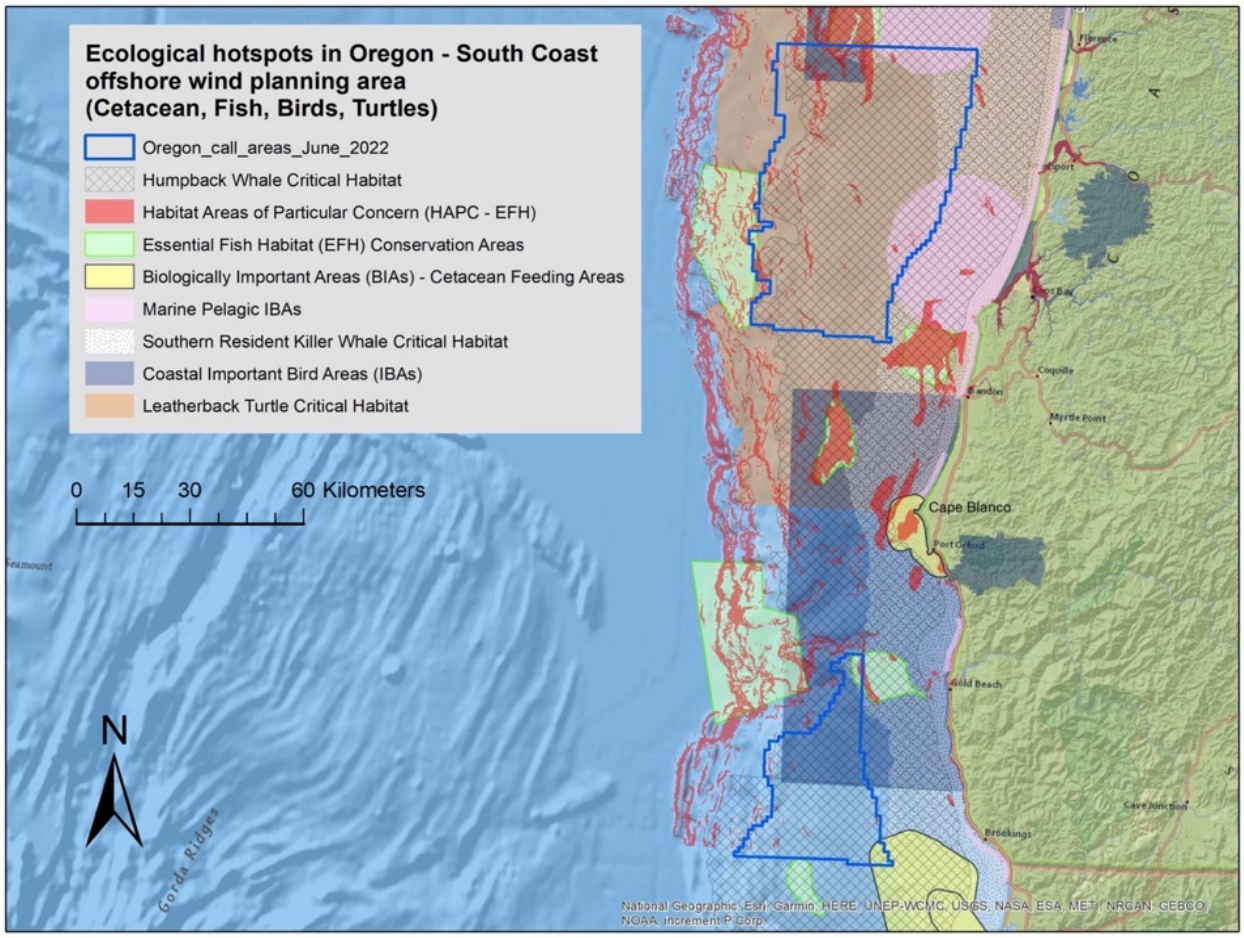


Fig. A1. Ecological Hotspots off Oregon's South Coast in BOEM's offshore wind planning area in relation to proposed Call Areas (Data Sources: Orowind).

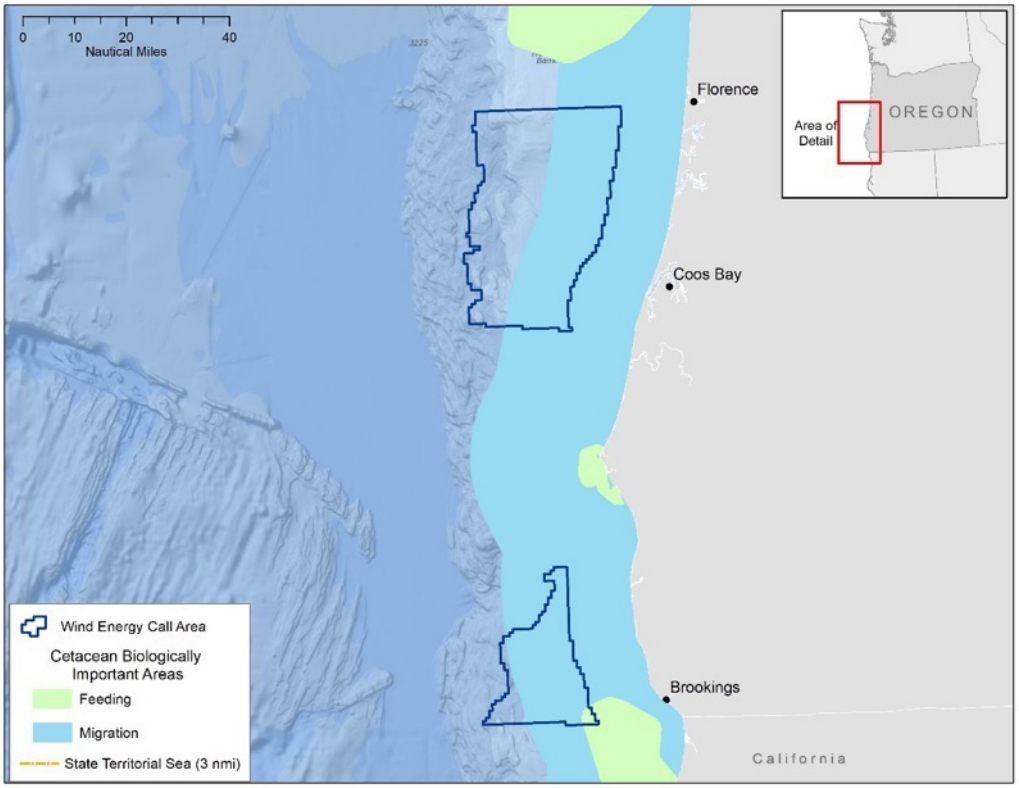


Fig. A2. Biologically Important Areas for Cetaceans showing migration corridors for gray whales and important feeding areas for gray whales and humpback whales (Source: Calambokidis 2015).

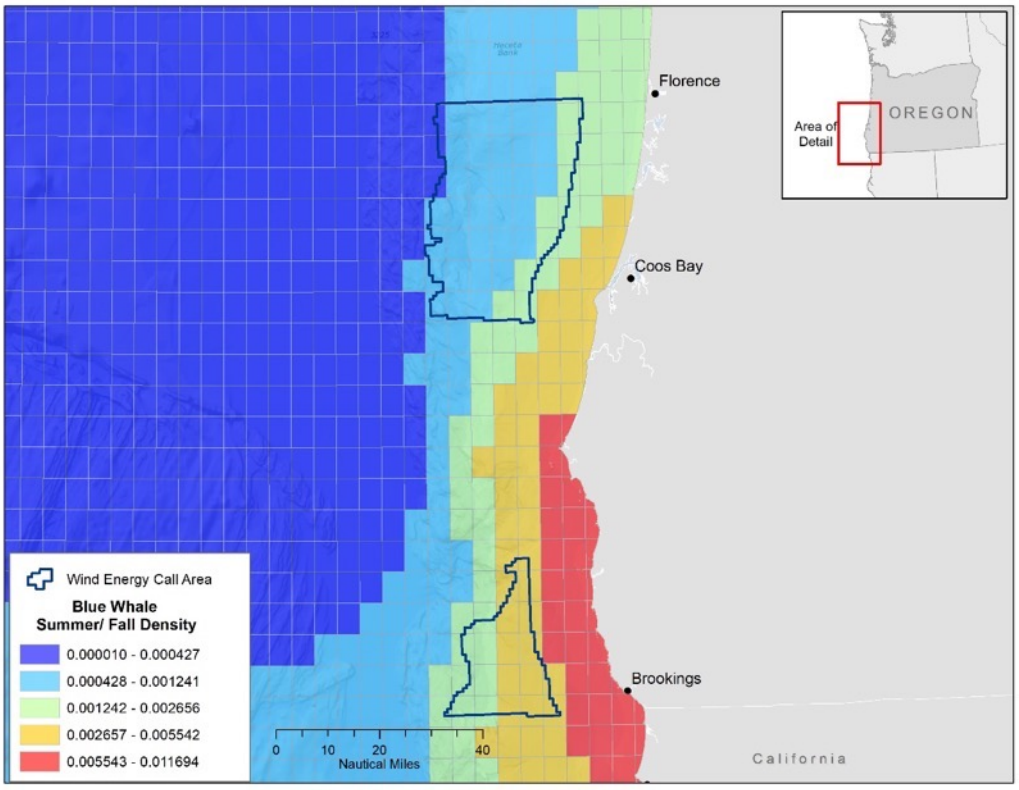


Fig. A3. Estimated summer/ fall density for endangered Blue Whales (NMFS 2022).

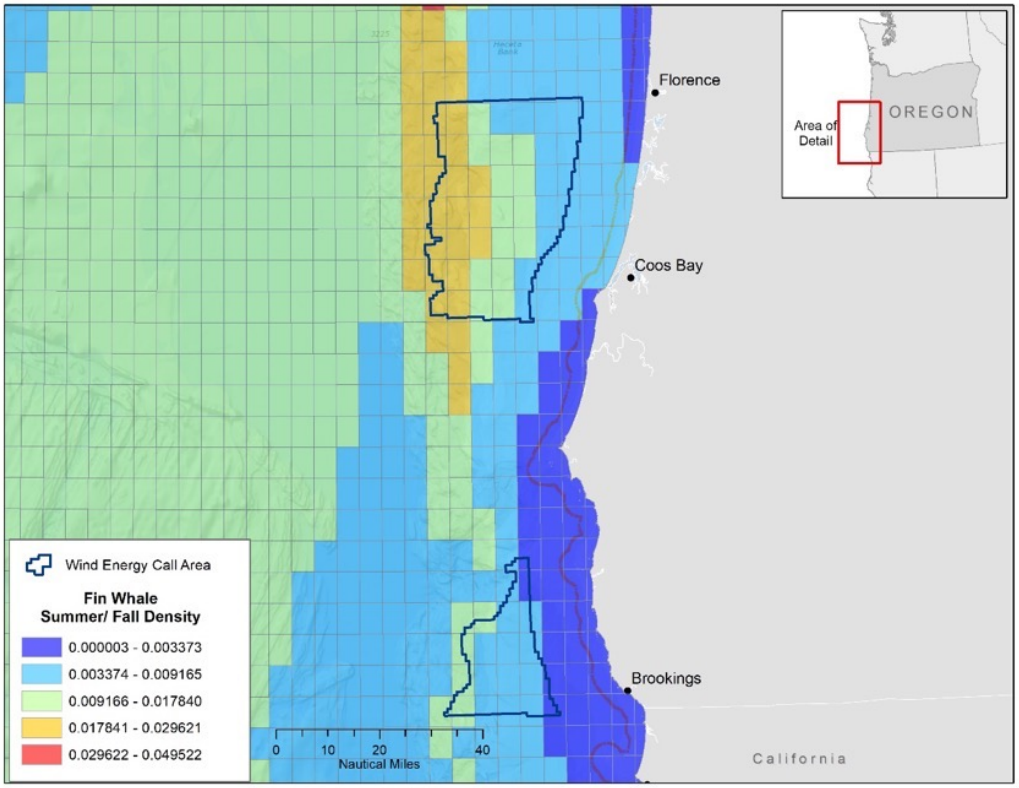


Fig. A4. Estimated summer/ fall density for endangered Fin Whales (NMFS 2022).

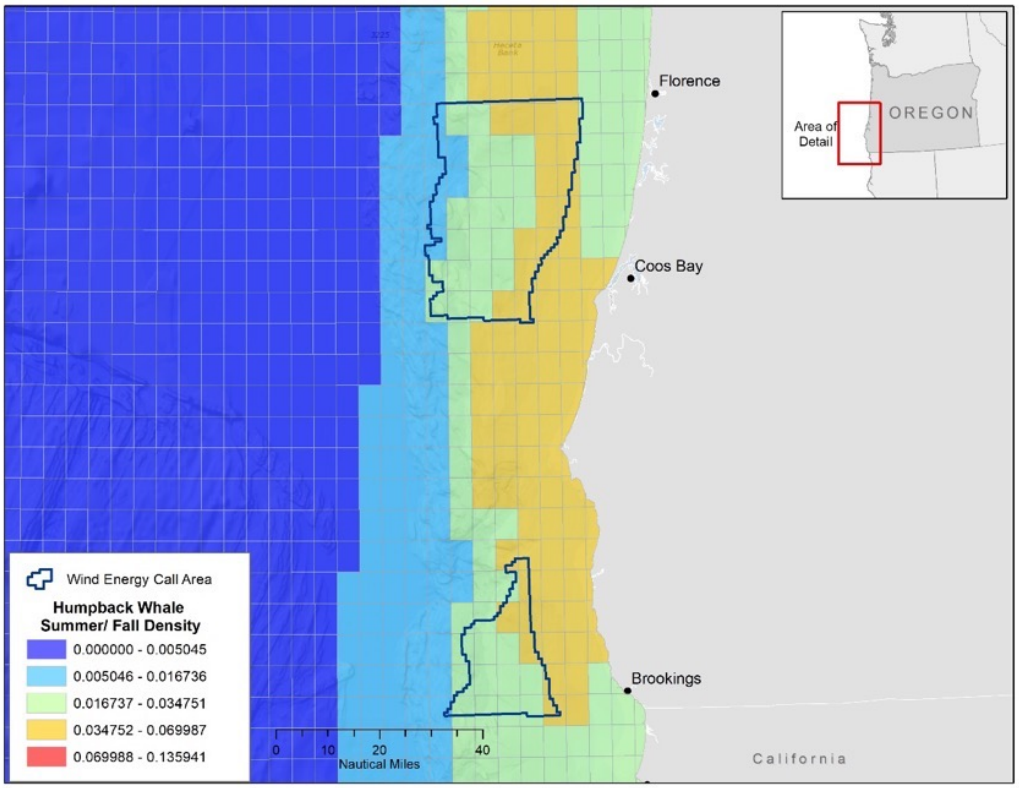


Fig. A5. Estimated summer/ fall density for threatened and endangered Humpback Whales (NMFS 2022).

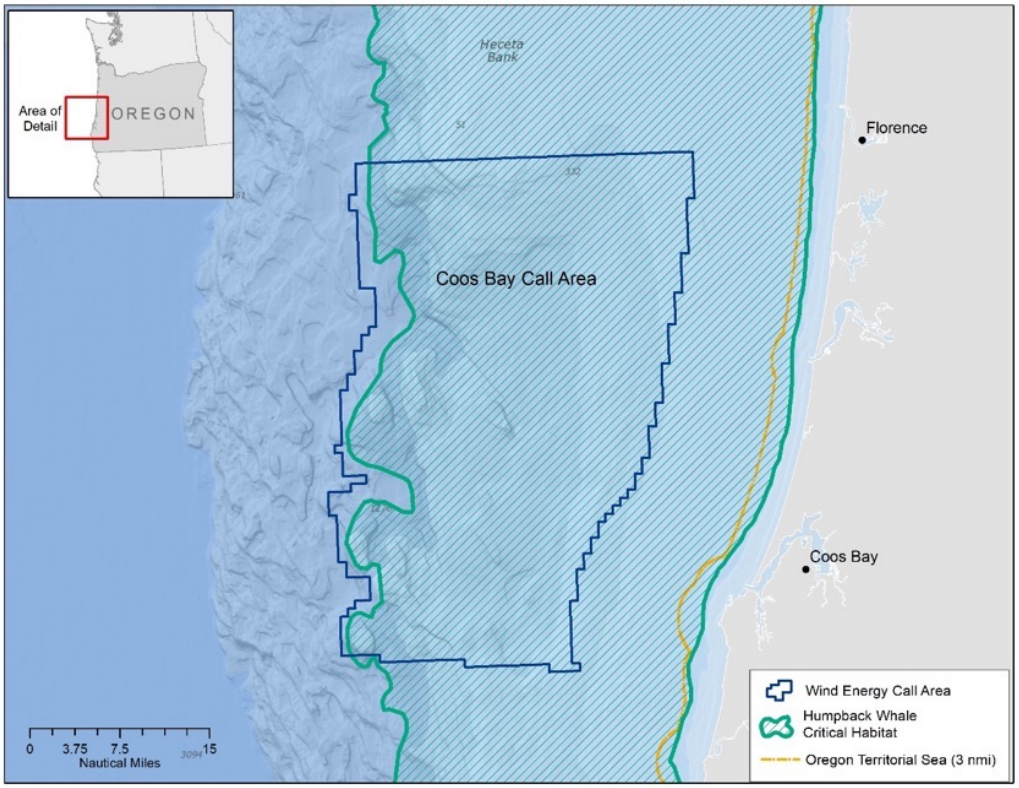


Fig. A6. Critical habitat for threatened and endangered Humpback Whale populations

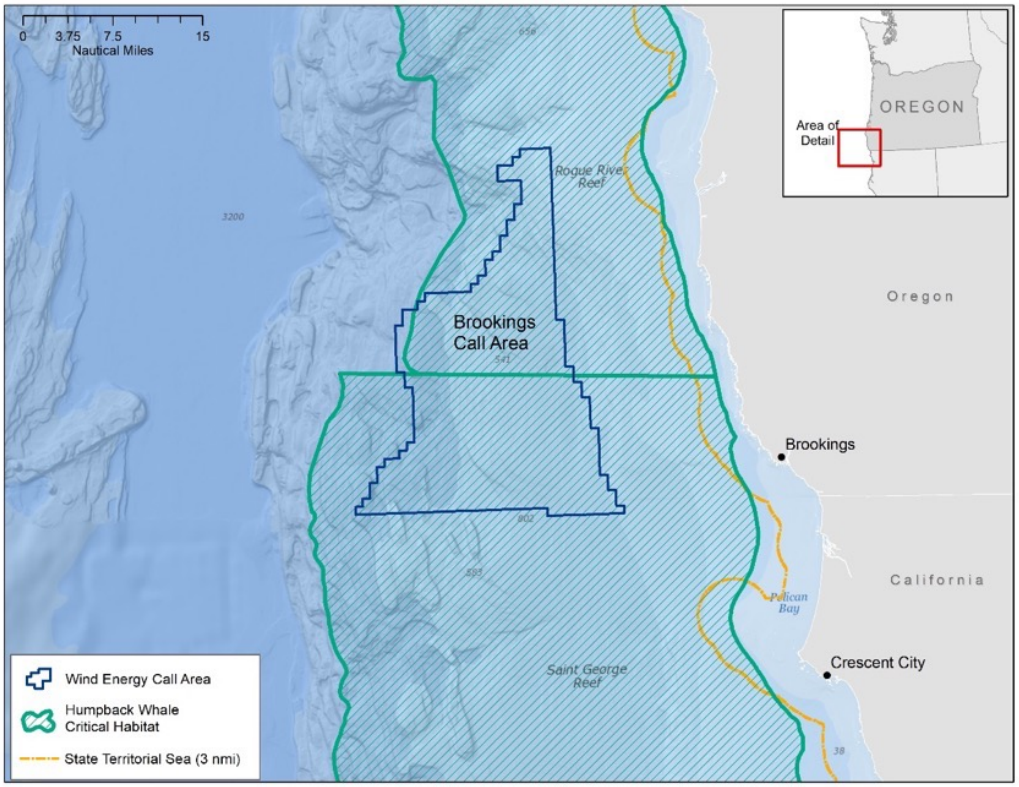


Fig. A7. Critical habitat for threatened and endangered Humpback Whale populations

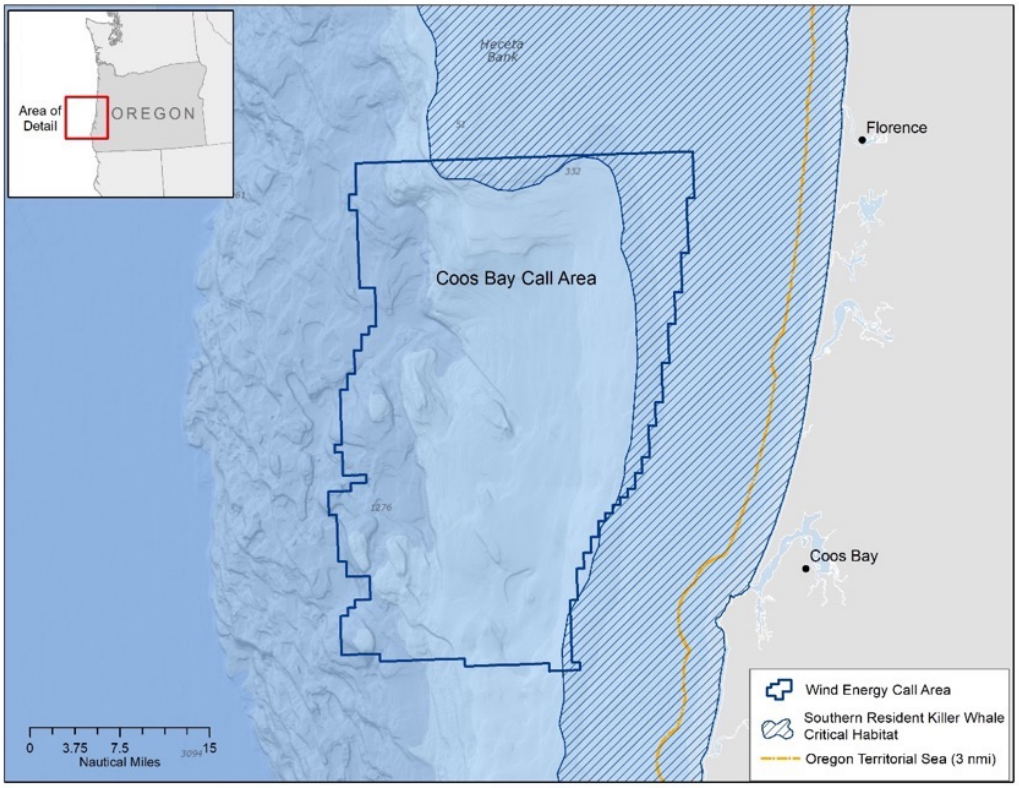


Fig. A8. The Coos Bay Call Area overlaps critical habitat or endangered Southern Resident Killer Whales

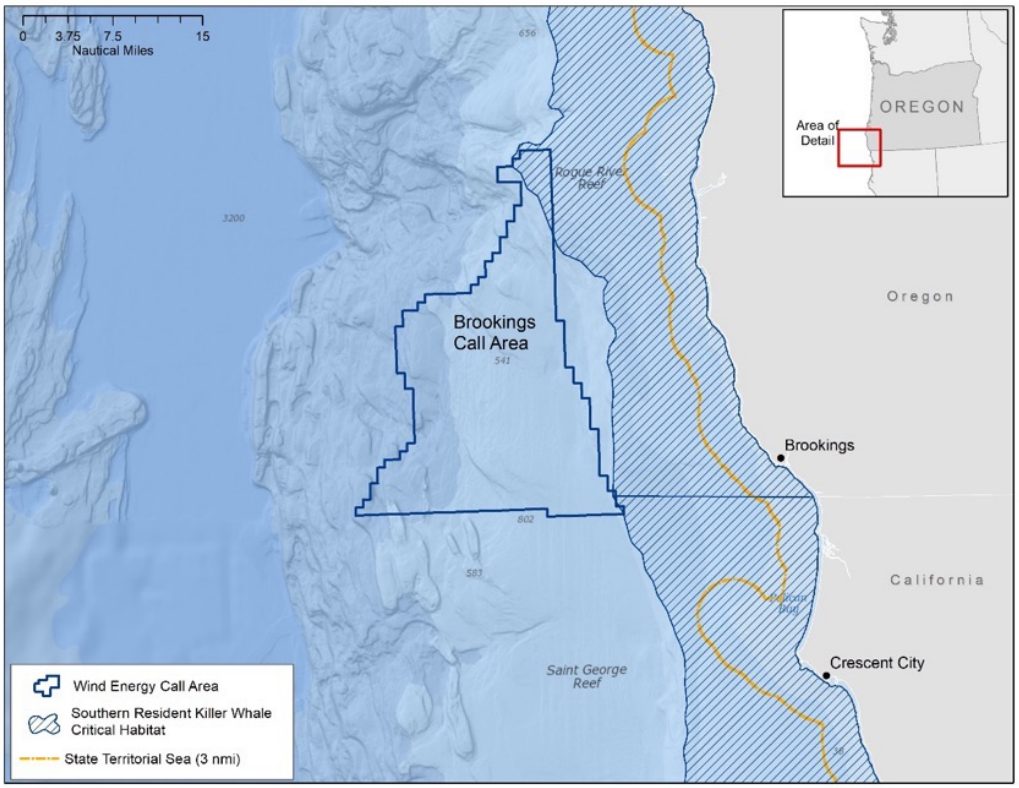


Fig. A9. The Brookings Call Area overlaps critical habitat for endangered Southern Resident Killer Whales

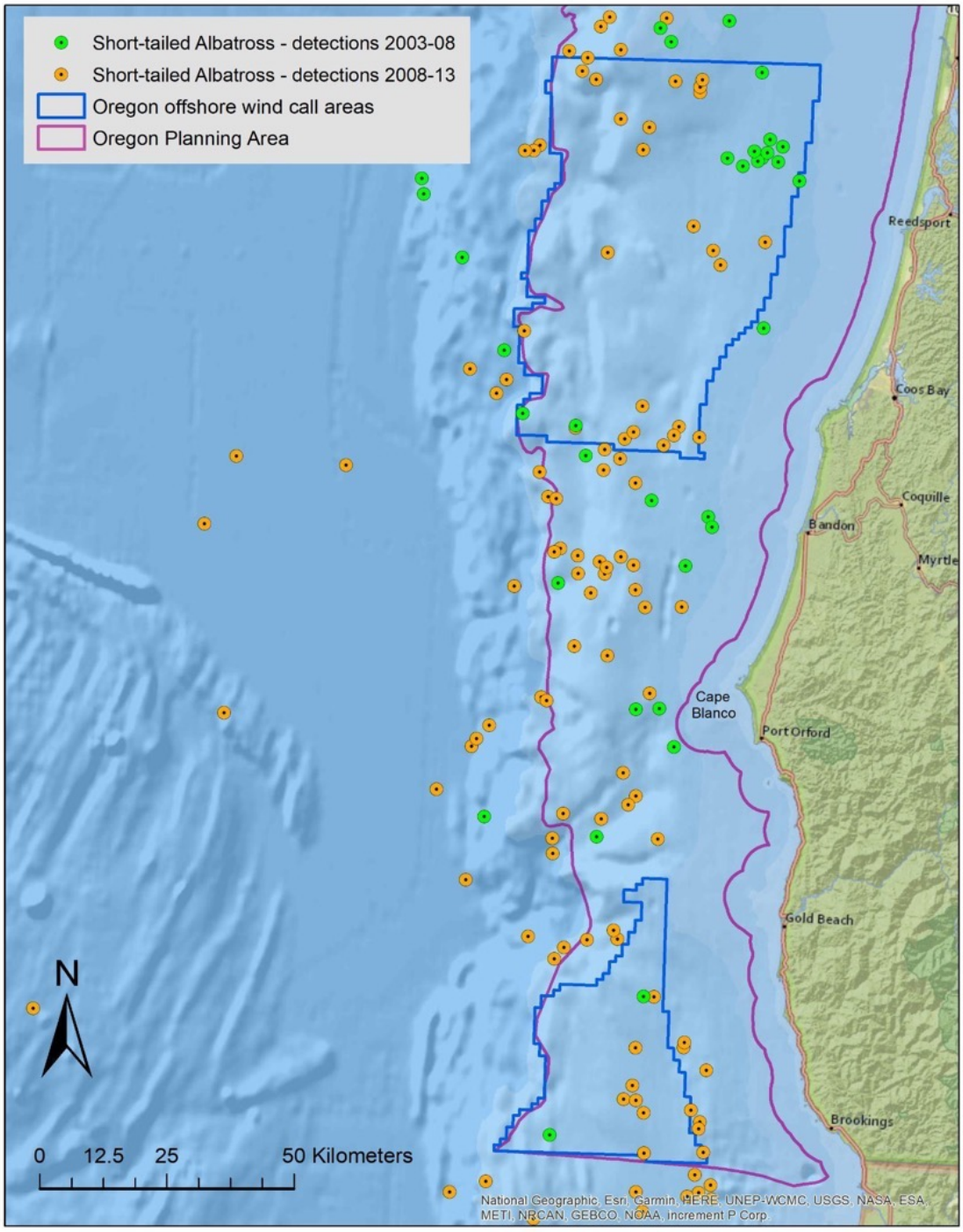


Fig. A10. Locations of satellite-tagged juvenile Short-Tailed Albatross that forage in Oregon's offshore waters indicate foraging in proposed Call Areas (Source: data provided by seabird scientists Rob Suryan and Rachel Orben).

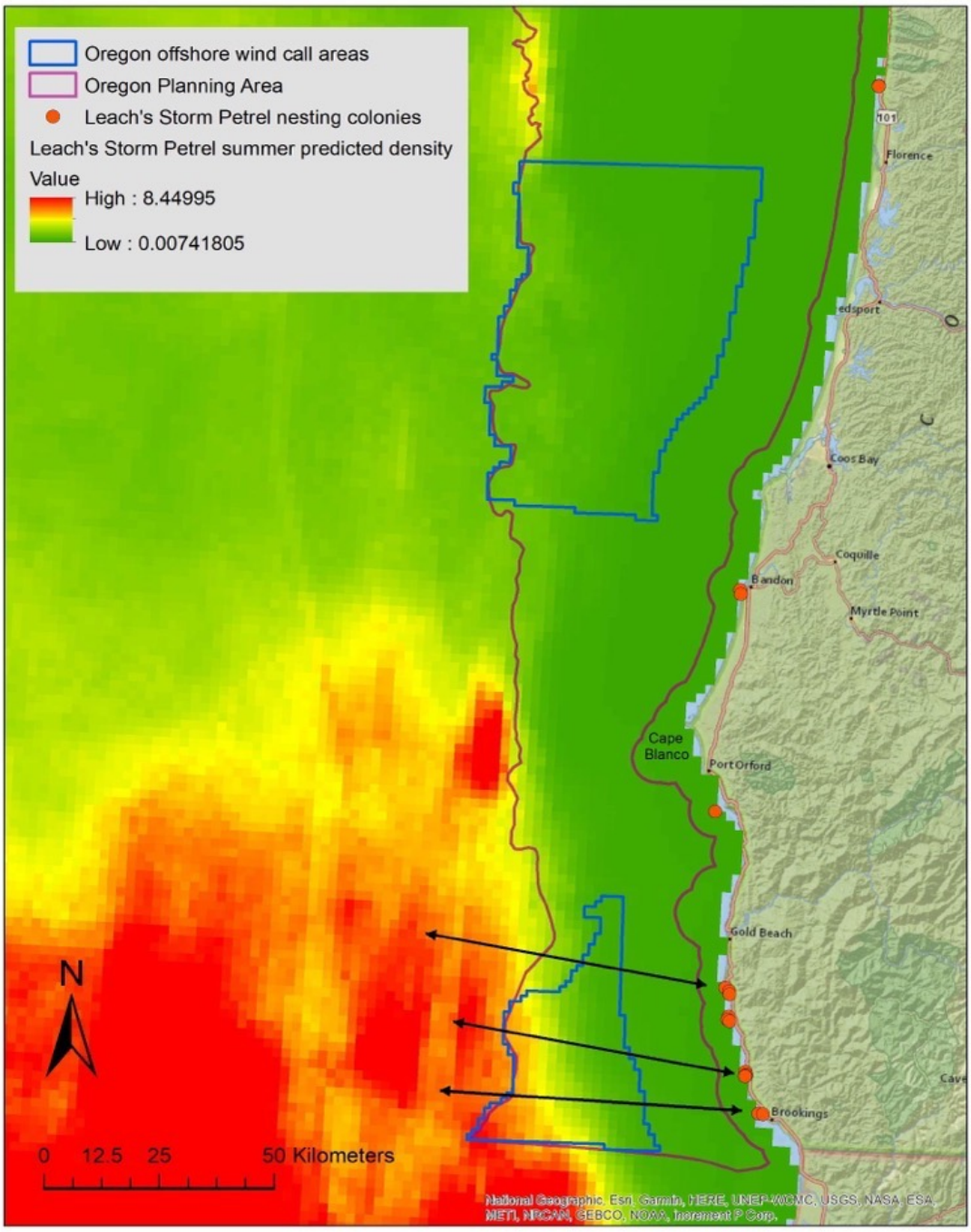


Fig. A11. Pathways from Leach's Storm Petrel breeding colonies to foraging areas west of Brookings Call Area point to the need for a tagging study to better understand the foraging behaviors of this species to better inform siting and minimize impacts. (Source data: Lierness, et al. 2021 and Naughton, et al, 2007

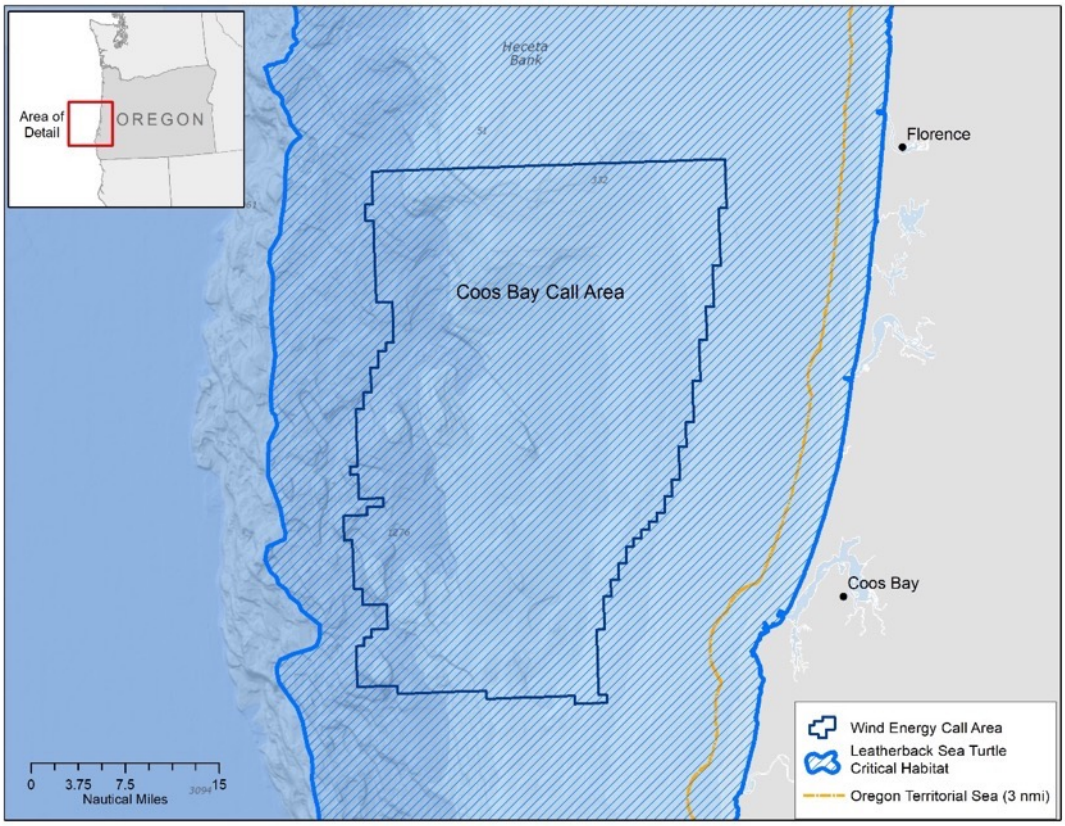


Fig. A12. The Coos Bay Call Area overlaps critical habitat for endangered Leatherback Sea Turtles

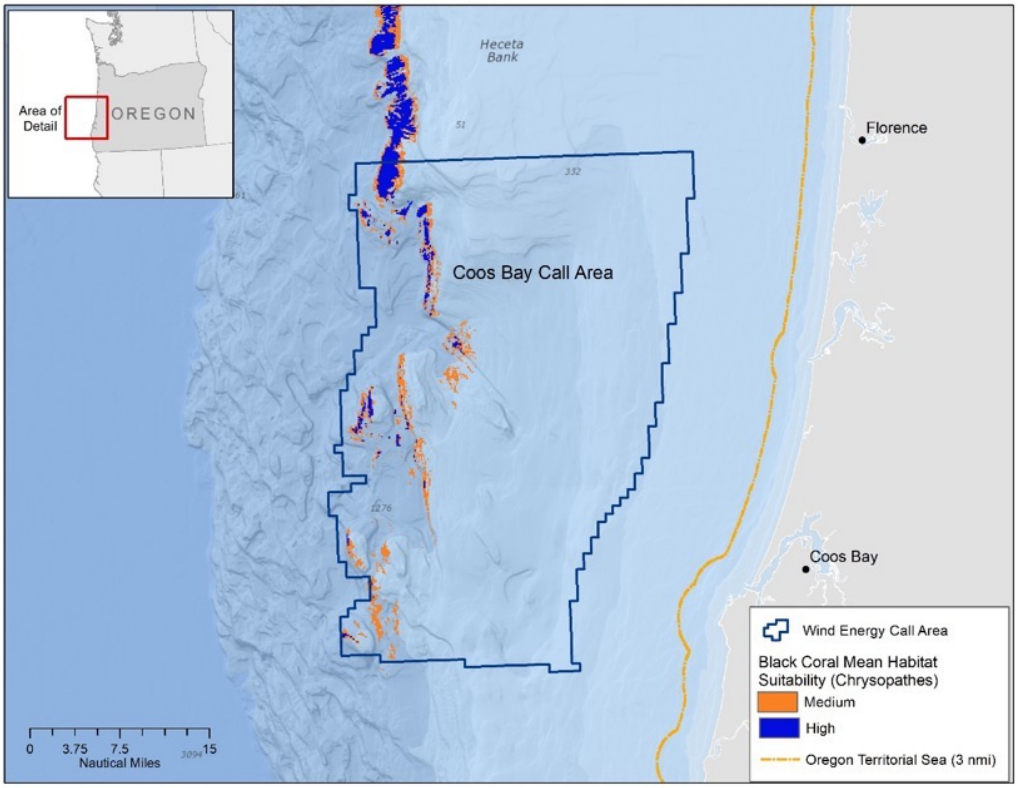


Fig. A13. Medium and high habitat suitability for black corals in the Coos Bay Call Area (Poti et al. 2020).

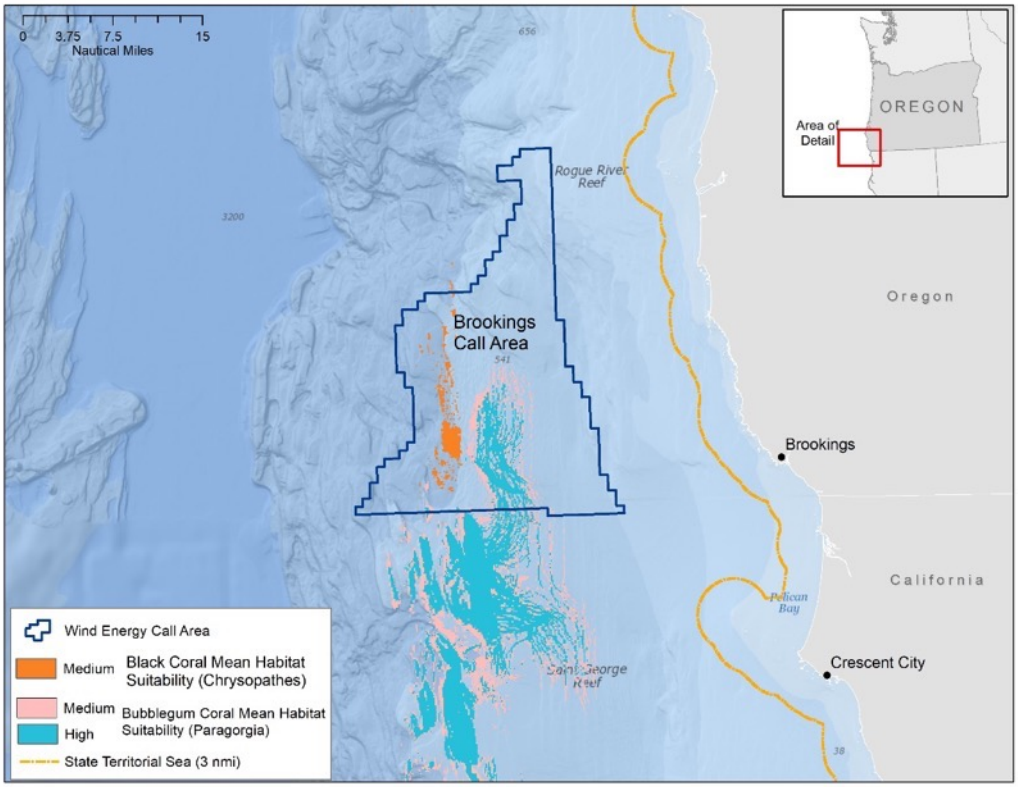


Fig. A14. Medium and high habitat suitability for black corals and Paragorgia bubble gum corals in the Brooking Call Area (Poti et al. 2020).

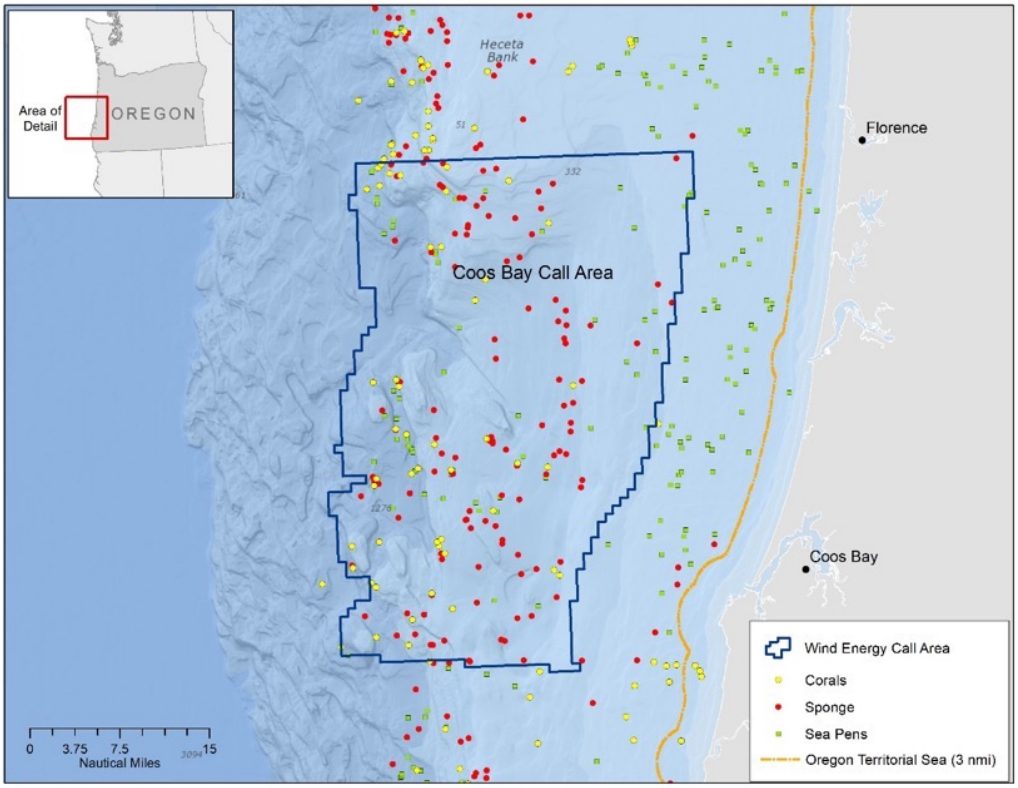


Fig. A15. NOAA Deep Sea Coal and Sponge Observations in the Coos Bay Call Area (NOAA 2021).

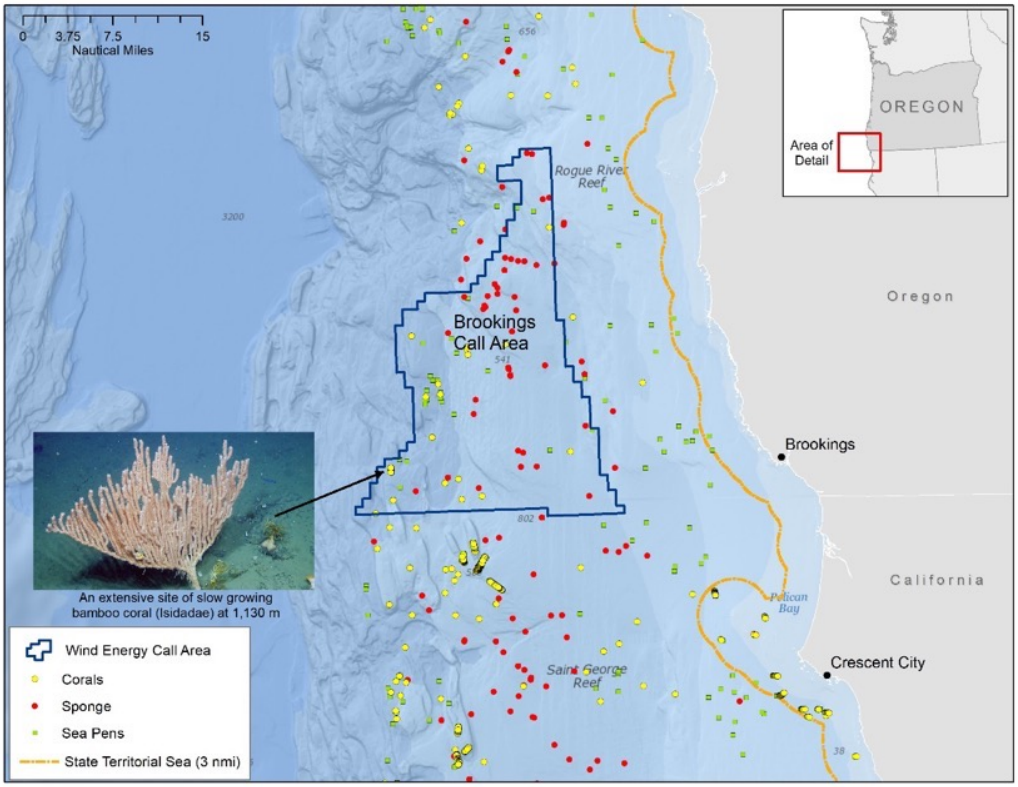


Fig. A16. NOAA Deep Sea Coal and Sponge Observations in the Brookings Call Area (NOAA 2021).

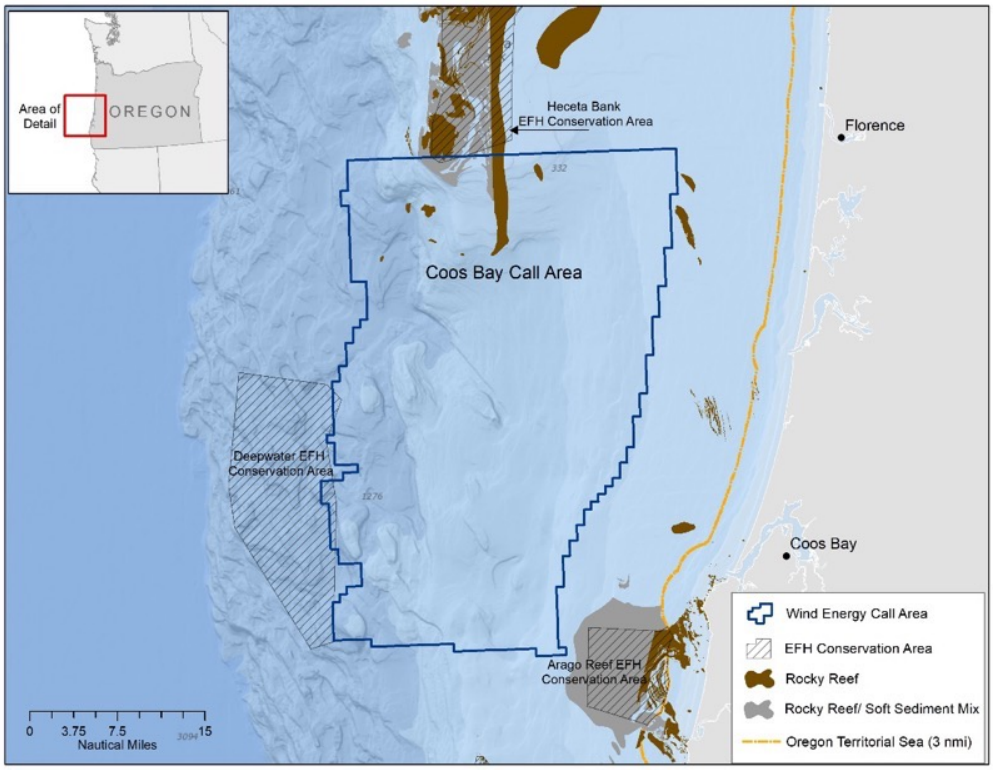


Fig. A17. The Coos Bay Call Area overlaps the Heceta Bank Essential Fish Habitat Conservation Area, the Deepwater EFH Conservation Area and Rocky Reef Habitat Areas of Particular Concern

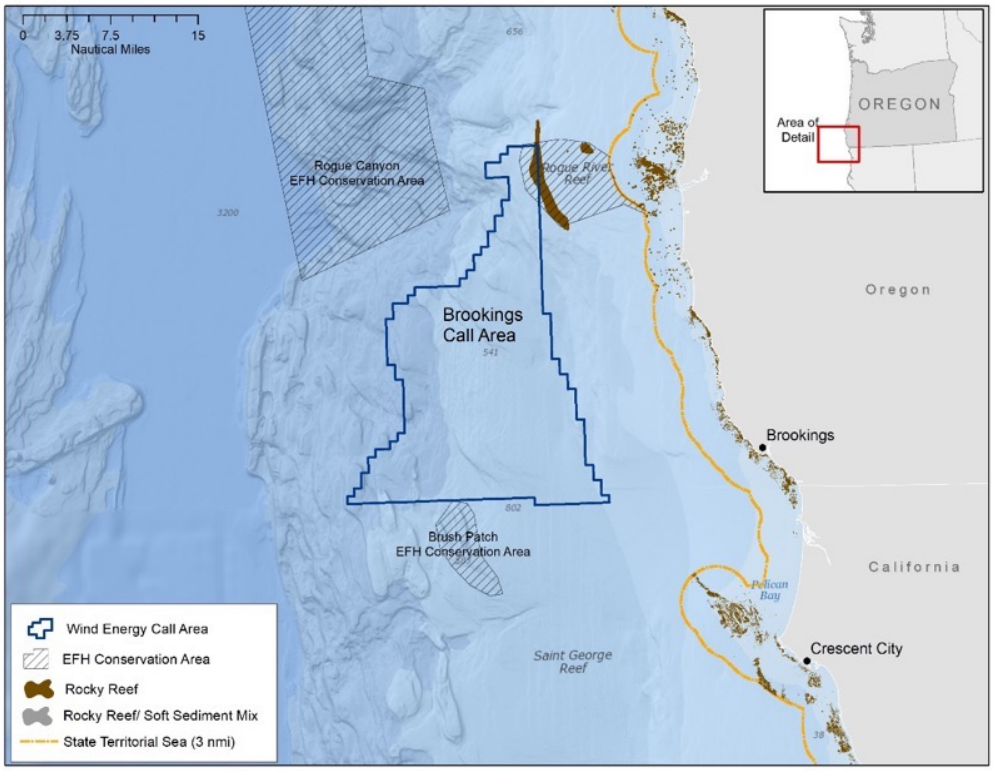


Fig. A18. The Brookings Call Area partially overlaps the Rogue Reef Essential Fish Habitat Conservation Area and Rocky Reef Habitat Areas of Particular Concern

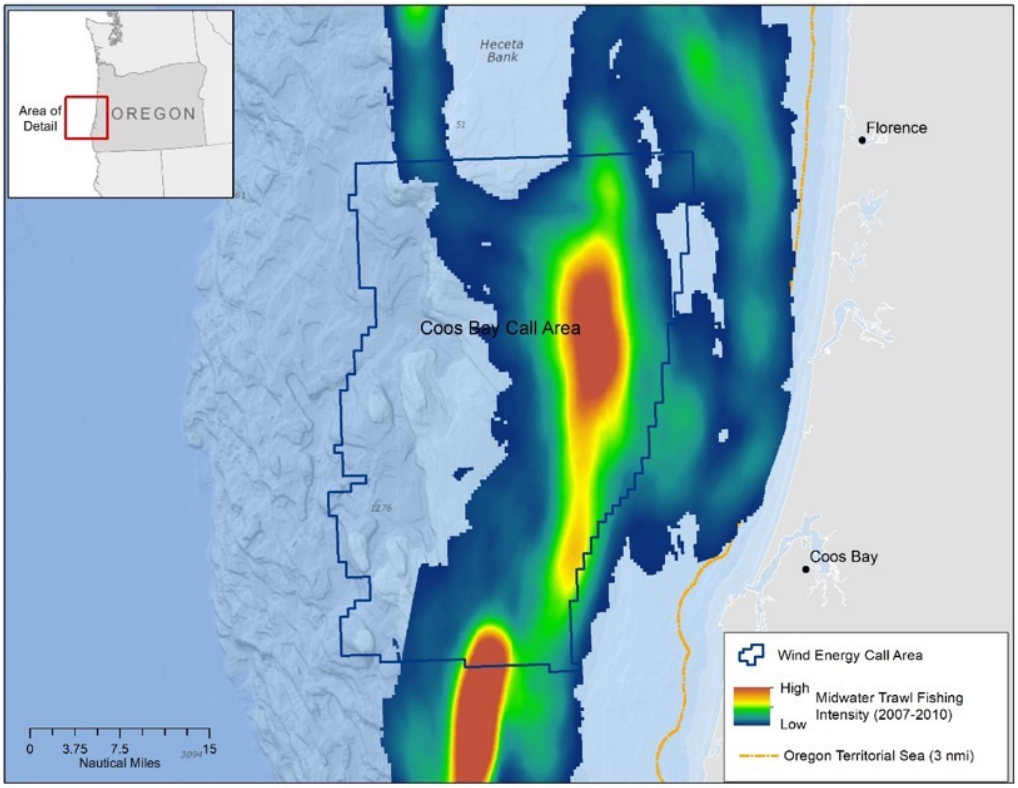


Fig. A19. Midwater trawl fishing intensity (2007-2010) overlapping the Coos Bay Call Area (NOAA FRAM)

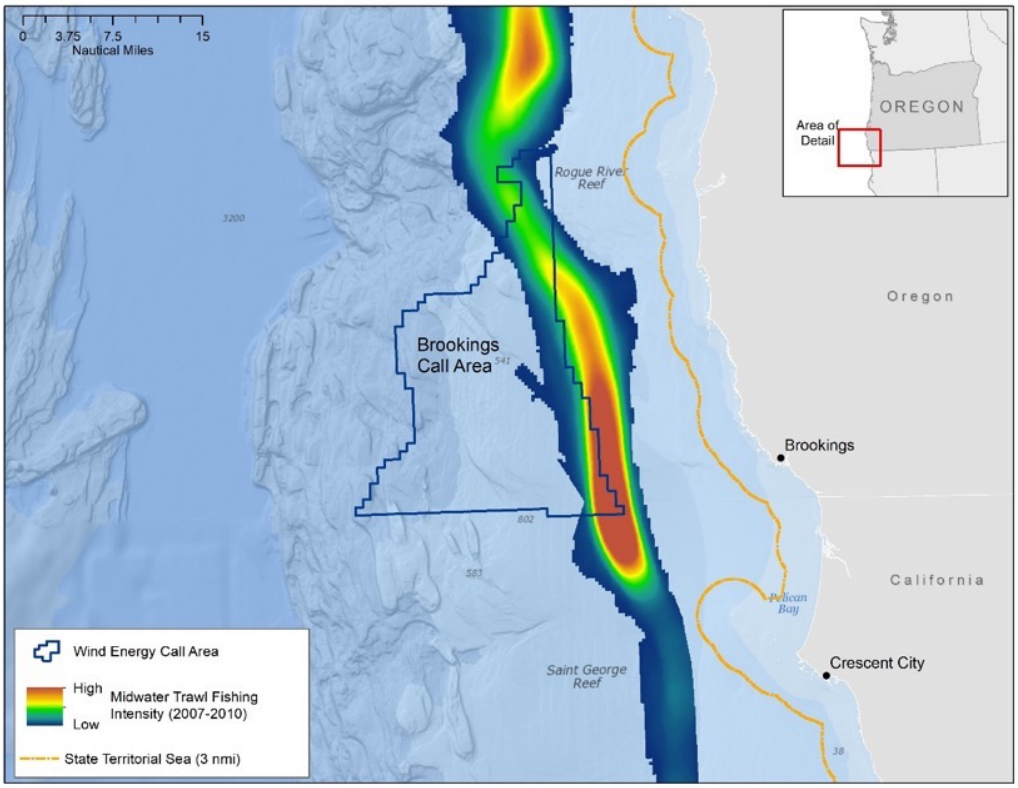


Fig. A20. Midwater trawl fishing intensity (2007-2010) overlapping the Brookings Call Area (NOAA FRAM)

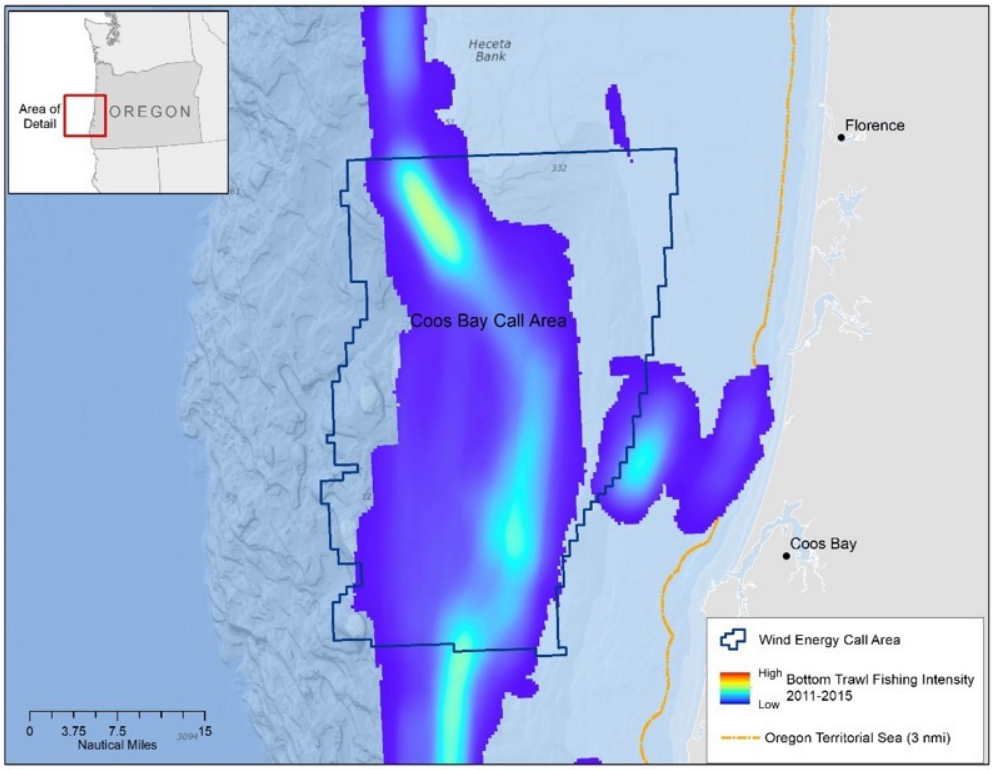


Fig. A21. Groundfish bottom trawl fishing intensity (2011-2015) overlapping the Coos Bay call area (NOAA FRAM)

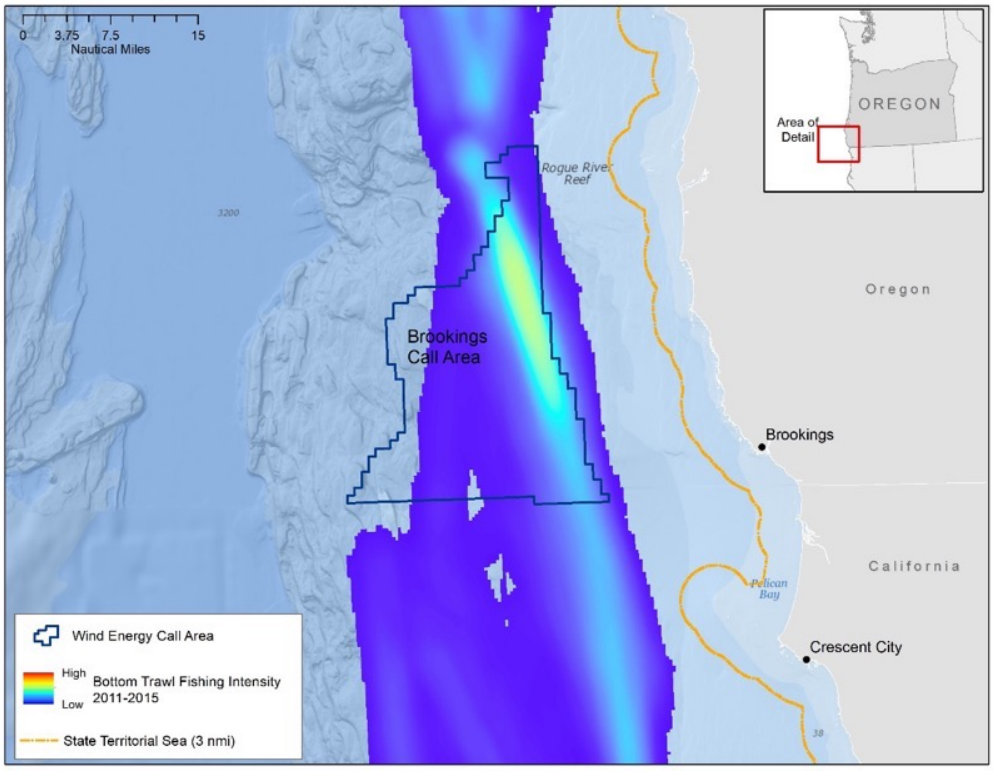


Fig. A22. Groundfish bottom trawl fishing intensity (2011-2015) overlapping the Brookings call area (NOAA FRAM)

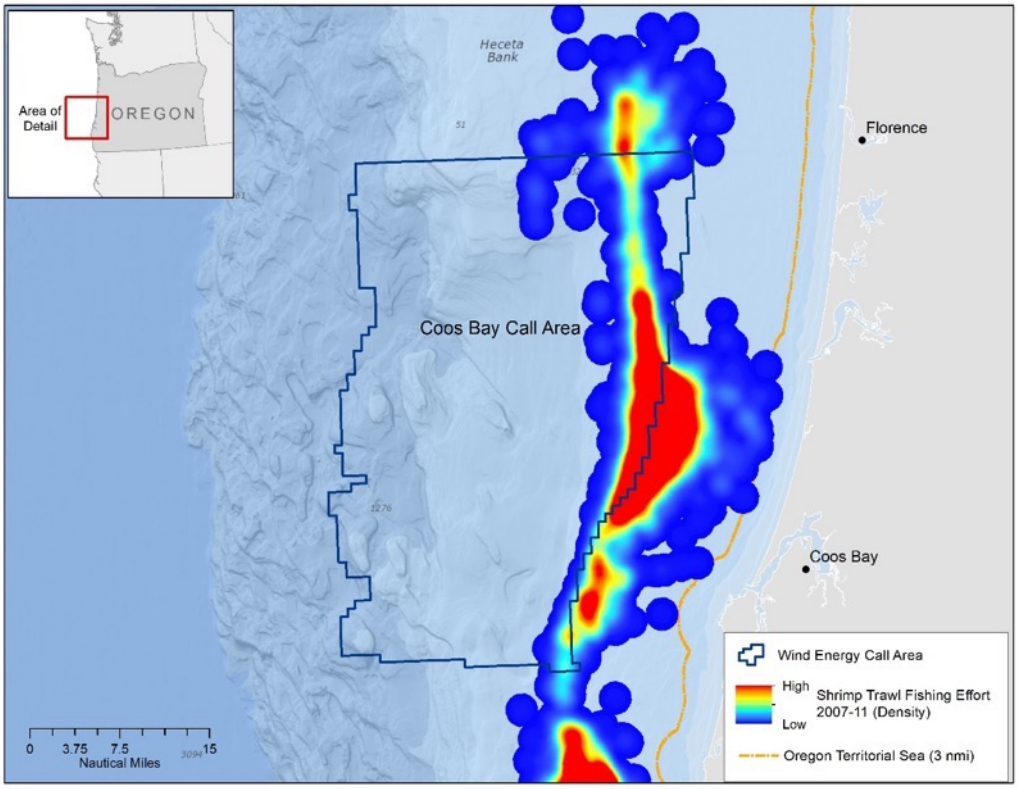


Fig. A23. Pink shrimp bottom trawl density (2007-2011) overlapping the Coos Bay call area (ODFW)

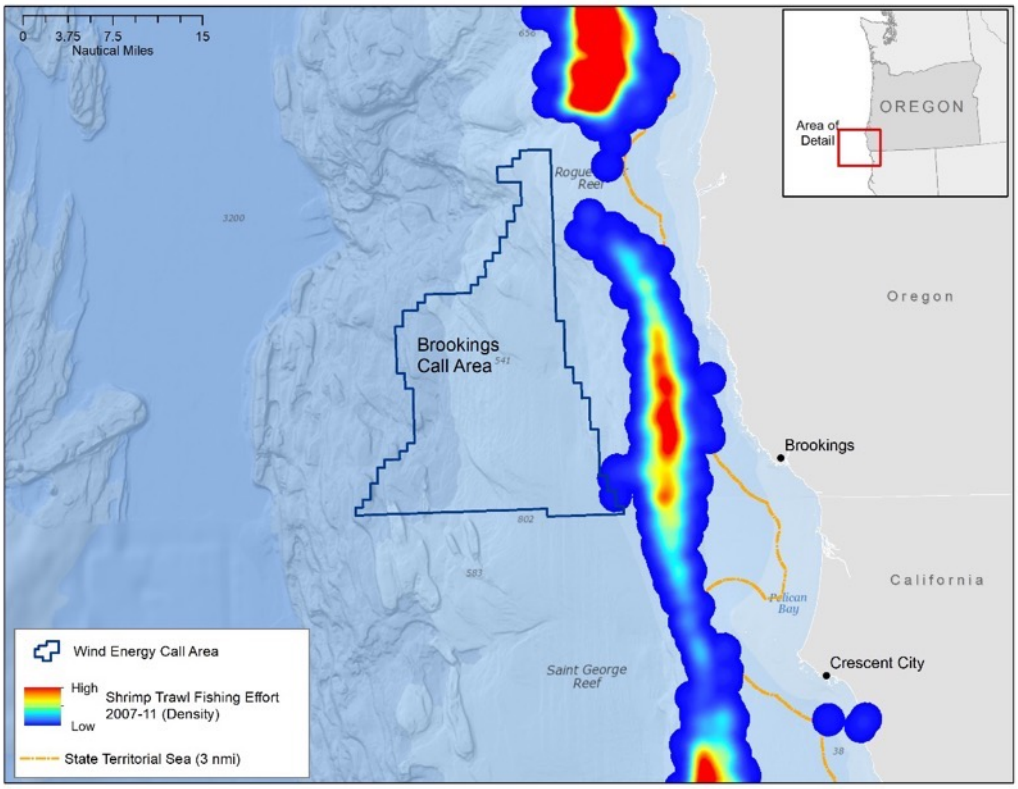


Fig. A24. Oregon pink shrimp bottom trawl density (2007-2011) overlapping the Brookings call area (ODFW)

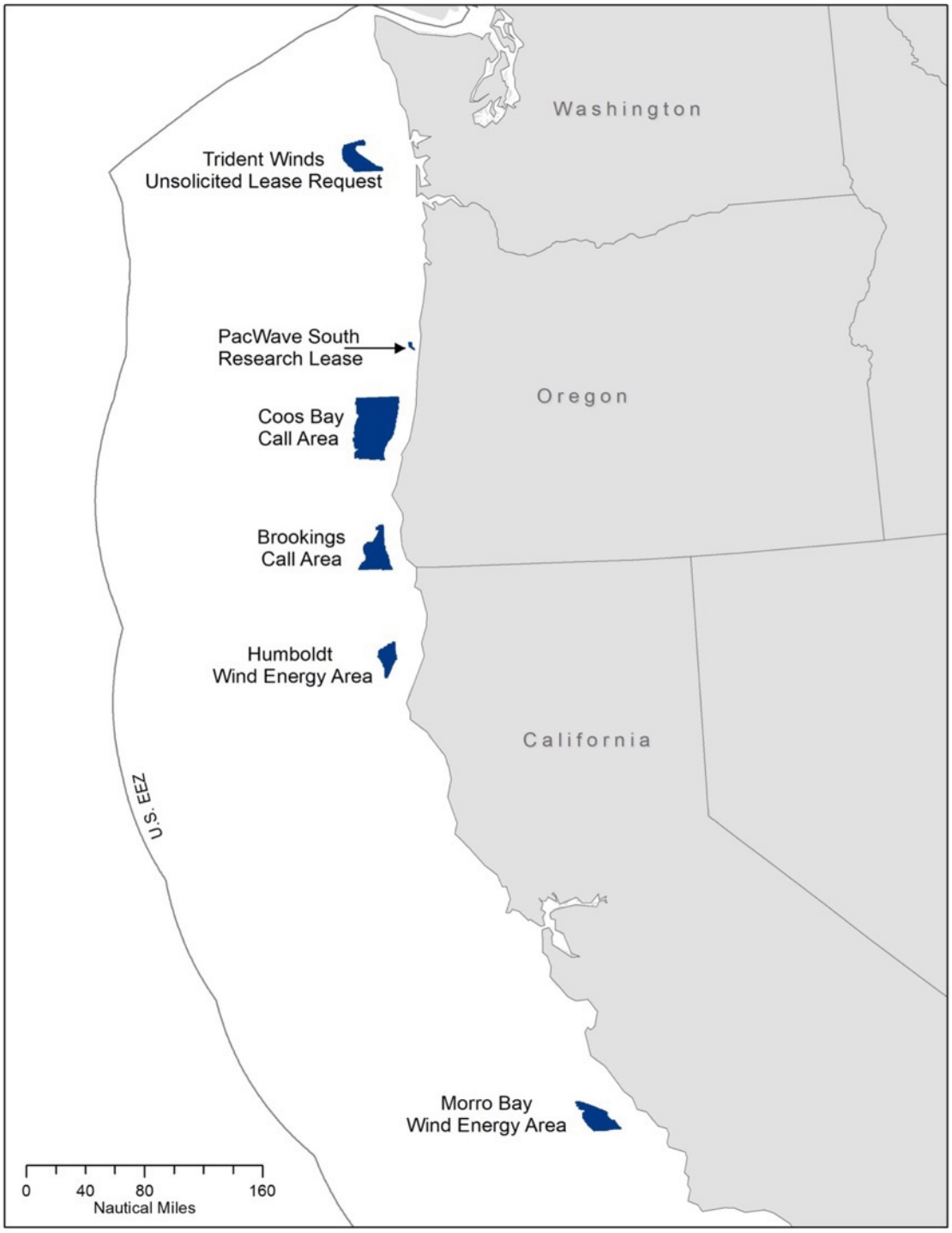


Fig. A25. The multiple Call Areas and Wind Energy Areas BOEM is currently considering for development in the California Current Marine Ecosystem underscore the need for a PEIS. Additional NREL "Areas of Interest" for potential future Call Areas (not shown) are located between the Brookings Call Area and the Humboldt WEA and extend southward of the Humboldt WEA (Map source: BOEM)

Appendix B. Seabird analysis to inform recommendations to minimize seabird impacts within proposed Oregon offshore wind Call Areas.

Background & objective

We used individual species maps of predicted seabird densities in West Coast waters developed by Leirness et al. (2021) to develop four multi-species maps (1 map per season) overlaying the two Oregon offshore wind Call Areas. The objective of this analysis is to provide BOEM newly synthesized maps to inform the siting of Wind Energy Areas (WEAs) within Call Areas to minimize seabird impacts based on the best available science. BOEM has encouraged such science-based recommendations to minimize potential offshore wind development conflicts during the on-going offshore wind process (Doug Boren, pers. comm.). The Leirness et al (2021) data set provides the most recent seabird density predictive modeling study for the region and is based on raw data from 21 studies conducted over several decades.

Important caveats

It is important to stress that the analysis described here and used for recommendations to BOEM does not provide a complete assessment of potential impacts to seabirds in waters off of Oregon. There are still huge gaps in our knowledge of seabird ecology in west coast waters. Specific limitations with the analysis include:

- Very rare species (e.g. Short-tailed Albatross) were not included in this analysis as detections of this species were too low to be included in the Leirness et al. (2021) modeling exercise.
- Some species may have had no or minimal predicted densities within the Call Areas but could still be affected by Call Areas (e.g. via migratory route transiting Call Areas).
- Some species may not have been detected in surveys used by Leirness et al. (2021), in particular small-bodied species and nocturnally active species are likely underrepresented in the raw data used in the predictive models (e.g. Leach's Storm Petrel, Marbled Murrelet).
- Leirness et al (2021) also provides important information on data limitations and information gaps regarding the data used for their predictive modeling (see pgs 34-35 of the report).

We address additional concerns of potential offshore wind impacts to seabird species separately outside of the findings of this particular analysis. These are included in the body of this comment letter.

Methodology

<u>Species selection</u>

First, we examined individual species maps and selected seabird species/species groups (Leirness et al. 2021 - Appendix E) that have higher relative densities (in at least one of the Call Areas for at least one season) to include in the analysis. BOEM Avian Biologist, Dave Perekstra, also recommended including several other species after sharing the initial list. We settled on including 15 species/species groups in the analysis (Table 1).

Table 1. Fifteen species/species groups selected for the multi-species analysis with high predicted densities in the Oregon floating offshore wind Call Areas, final vulnerability score used and season/species included in analysis.

Species	**Normalized combined vulnerability score**	**Season included in analysis**
Black-footed Albatross	60.6	All
Pink-footed Shearwater	60.0	Spring, Summer, Fall
Rhinoceros Auklet	57.5	Fall, Winter
Common Murre	55.3	All
Western/Glaucous-winged Gull	53.4	All
Cassin's Auklet	50.8	All
Sabine's Gull	46.1	Spring, Summer, Fall
Herring/Icelandic Gull	44.2	All
Black-legged Kittiwake	42.5	Winter
Buller's Shearwater	42.2	Summer, Fall
Pomarine/Long-tailed/Parasitic Jaeger	42.2	Spring, Summer, Fall
Short-tailed/Sooty/Flesh-footed Shearwater	42.1	All
Fork-tailed Storm-Petrel	41.4	Spring, Summer
Northern Fulmar	40.0	All
Red/Red-necked Phalarope	39.7	Summer

Analysis

To create a multi-species map combining the 15 individual species / species groups we followed the recommendations on pg. 35 of Leirness et al. (2021). We accessed TIFF raster imagery from Data Basin. In ArcGIS Pro we normalized the predicted grids for individual species/groups by dividing each cell of the grid by the mean of all cells in the grid. We then clipped the normalized data set to the two Oregon Call Areas (Coos and Brookings).

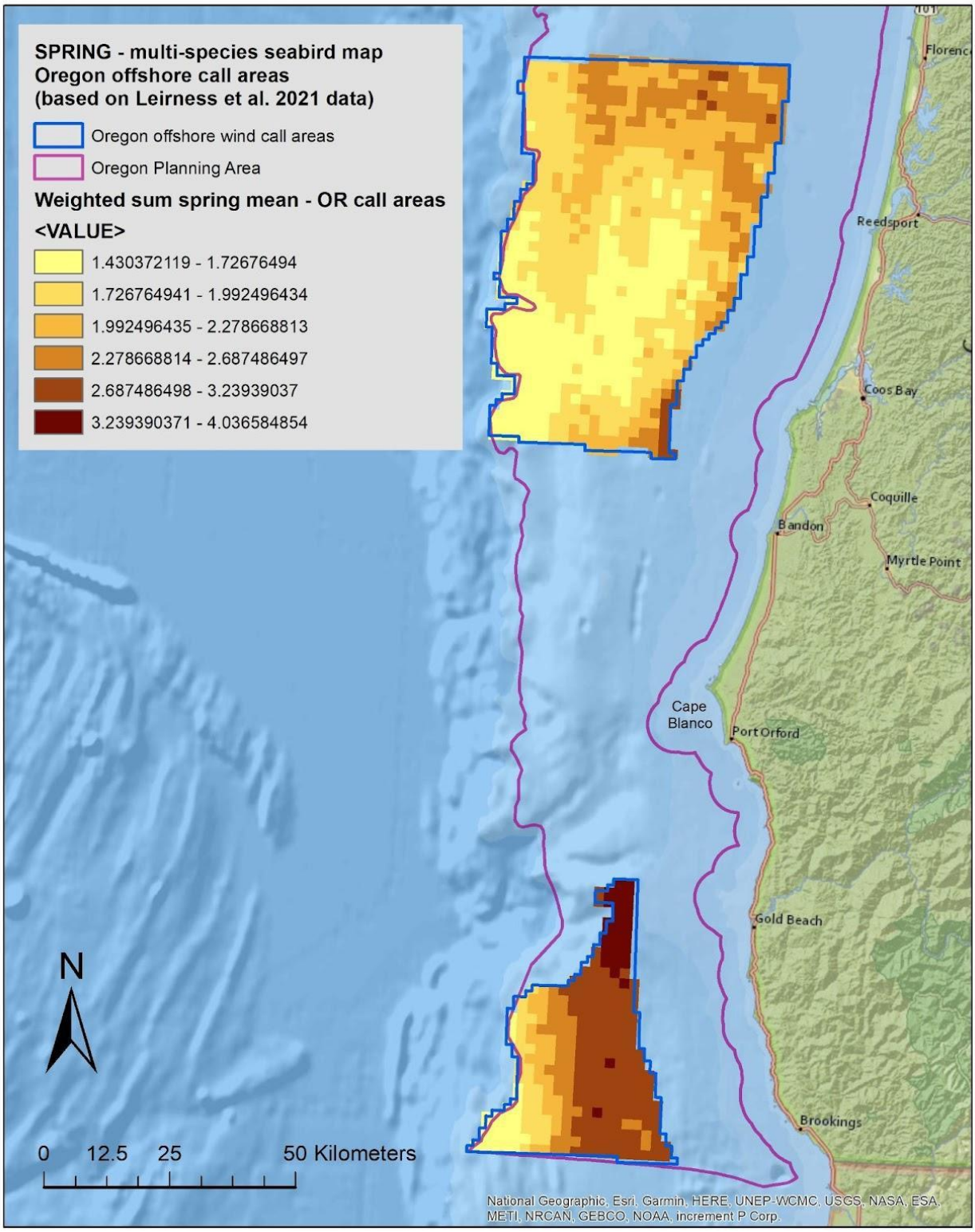
We then included a weighting factor for each species/species groups to incorporate differing population vulnerability estimates and collision and displacement vulnerability estimates (to offshore wind development) developed by Kelsey et al. (2018). The vulnerability indices in that paper are not in the same scale (they have different minimum and maximum values) so we needed to normalize those indices in order to combine them into one vulnerability estimate for each species/species group. We normalized the vulnerability estimates by first identifying the lowest and highest possible vulnerability scores as defined by Kelsey et al. (2018). Those values then were input along with the best estimate for each species to the following equation: ((best estimate - min. range value)/(max. range value-min range value))*100. For the population vulnerability estimate we excluded global population size (POP) and Annual Occurrence (AO). Those two components of the population vulnerability estimate were already compensated for since we selected 15 species/species group and because we are examining each season separately. We then averaged the collision, displacement, and population vulnerability for each species/species group. These final estimates were used to weight species vulnerability (Table 1).

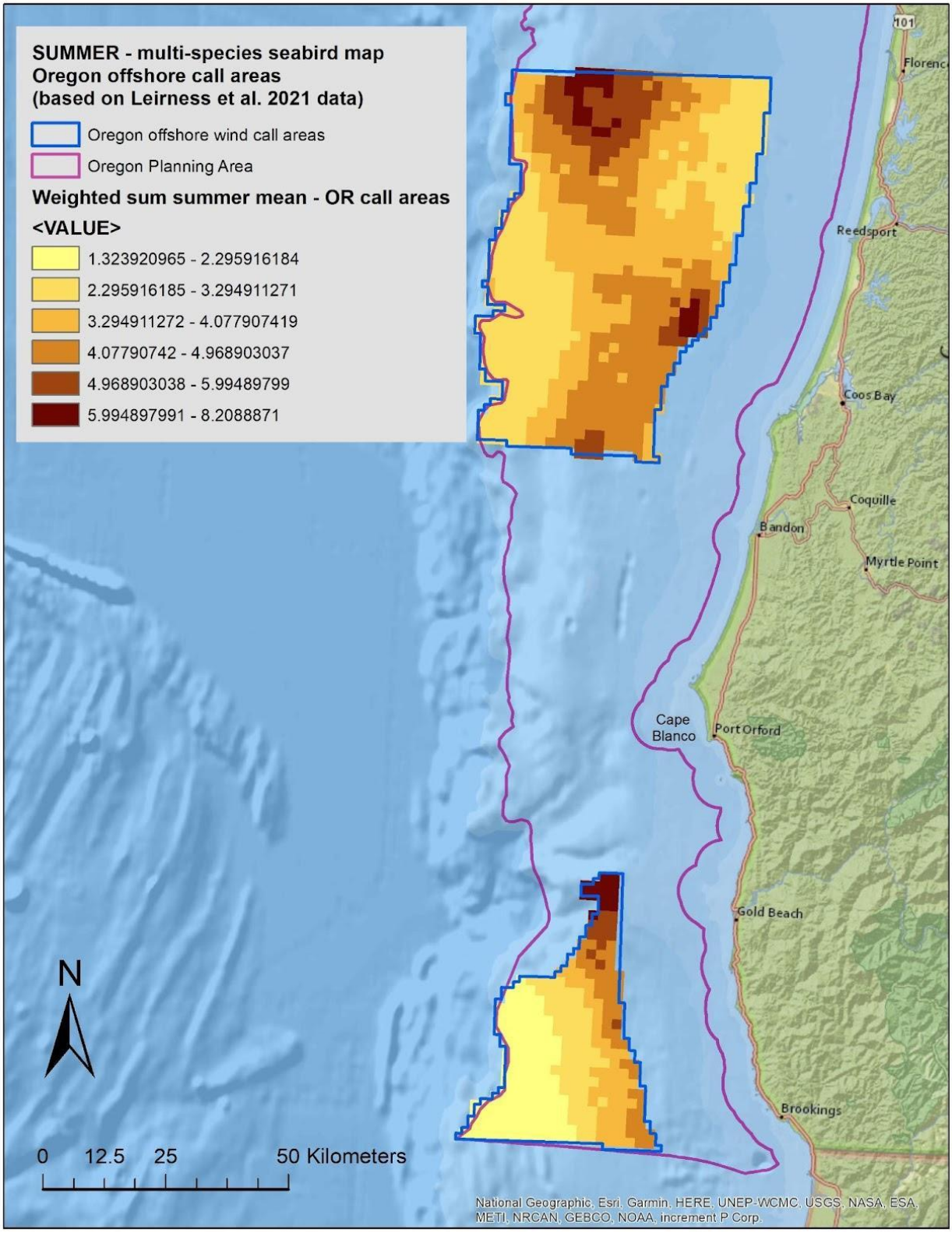
Using ArcGIS Pro, a weighted sum for each season including species present during that season was calculated. The weighted sum results were then divided by the sum of weights used for the relevant season. This was performed using the following script: (([raster1]*weight1) + ([raster2]*weight2))/sum of weights). Final weighted multi-species maps (one per season) were created in ArcGIS Pro with symbology criteria set to "classified" with natural breaks (6 classes).

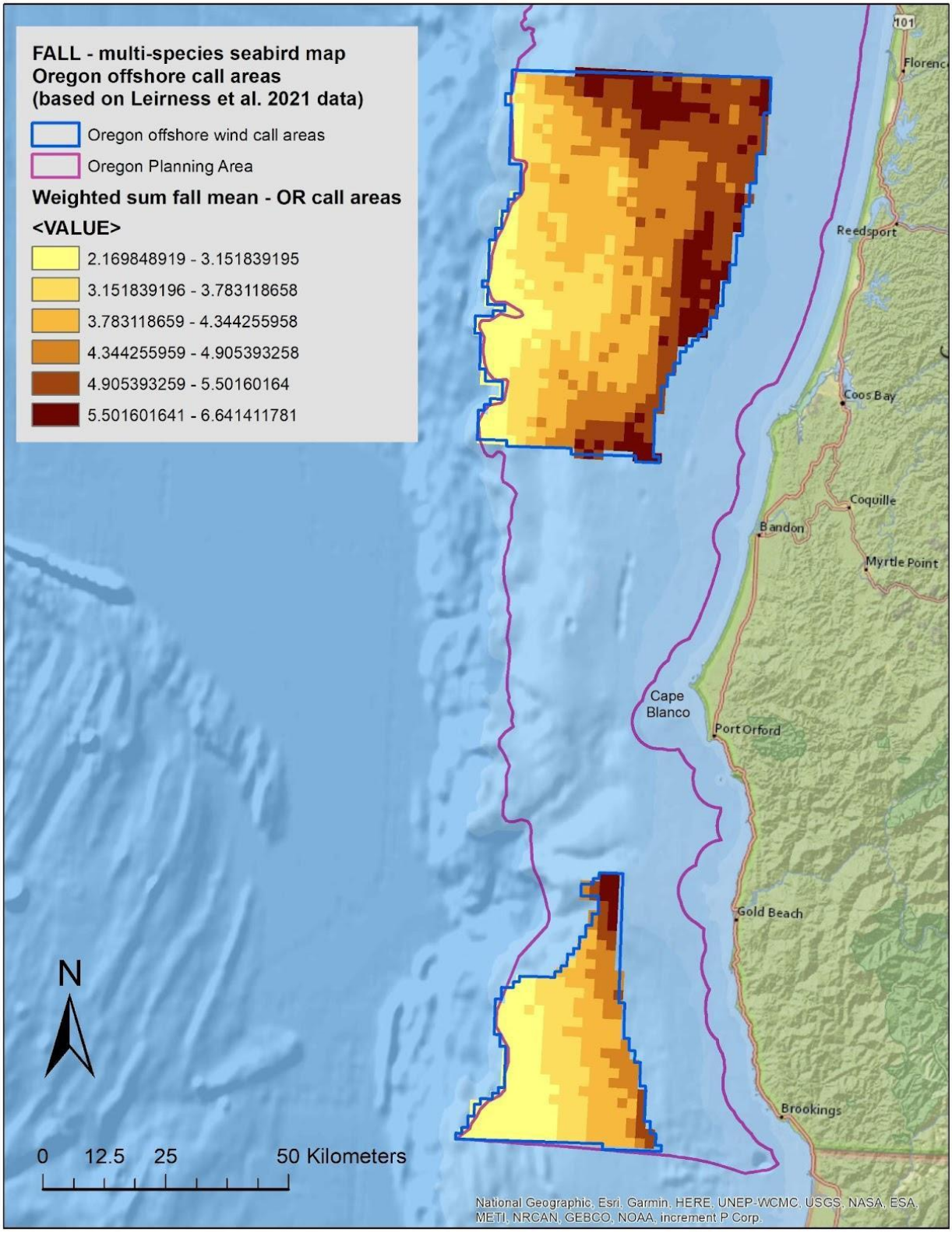
Results

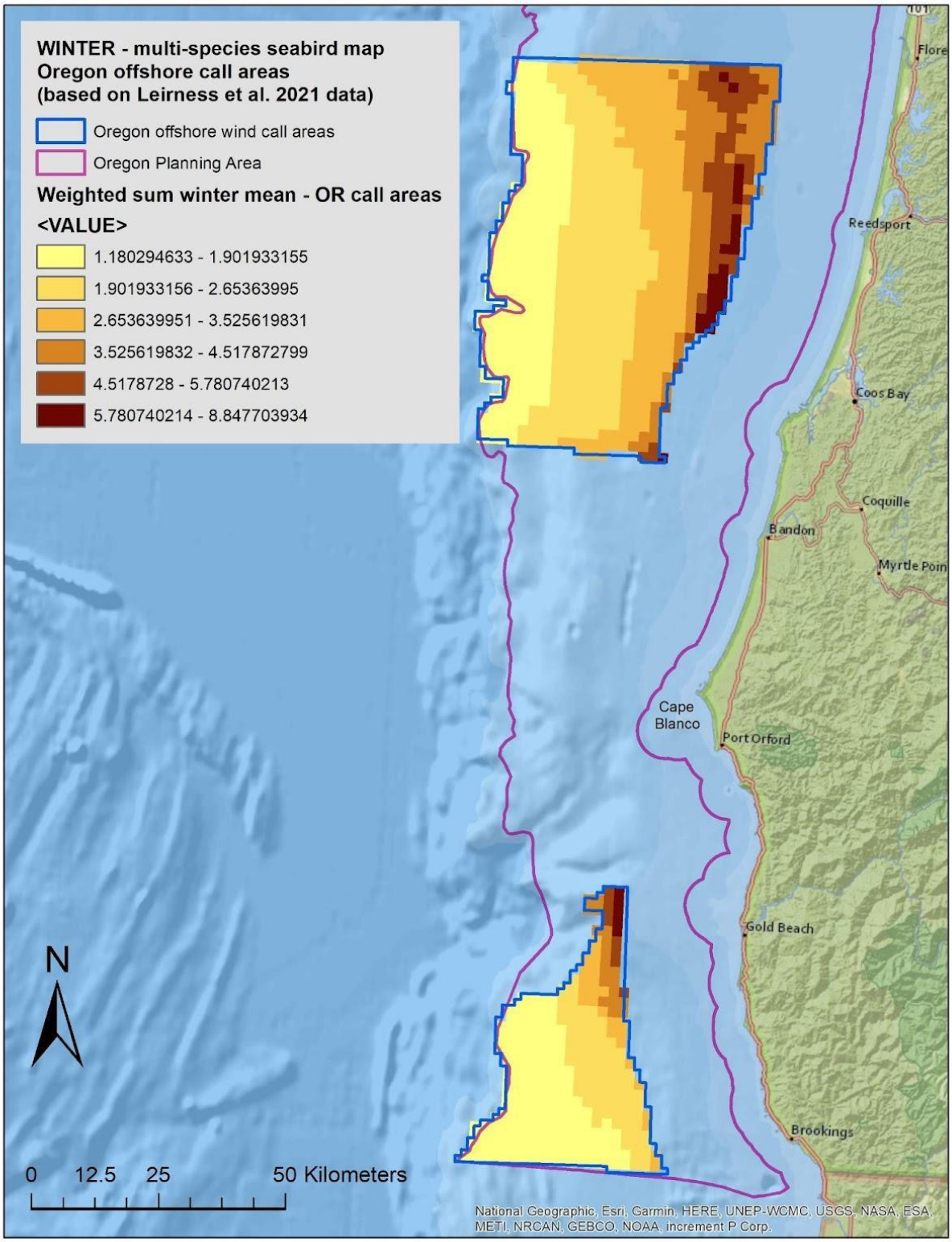
The four maps below depict the final modeling results for each season (spring, summer, fall, winter) for predicted seabird densities within the Call Areas. It is important to point out that the ranges of densities within the Call Areas do not reflect the highest and lowest possible densities of seabirds in the larger offshore wind planning area. We restrict our analysis to the Call Areas since those are the sites under consideration for development. Our core findings include:

- We documented higher seabird densities in the summer and fall in the northern section of the Coos Bay call area which overlaps the southern portion of the Heceta Bank region.
- The eastern portion of both call areas (approximately 15 km section) includes relatively higher seabird densities compared to other areas within the Call Areas. For the Bandon Call Area (particularly the northern arm of this Call Area) this is true for all 4 seasons. For the Coos Bay Call Area this is most apparent in 2 of the 4 seasons (fall and winter).


SPRING - multi-species seabird map
Oregon offshore call areas
(based on Leirness et al. 2021 data)
Oregon offshore wind call areas
Oregon Planning Area
Weighted sum spring mean - OR call areas
<VALUE>
1.430372119 - 1.72676494
1.726764941 - 1.992496434
1.992496435 - 2.278668813
2.278668814 - 2.687486497
2.687486498 - 3.23939037
3.239390371 - 4.036584854
Florenc
Reedsport
Coos Bay
Coquille
Bandon
Myrtle Point
Cape Blanco
Port Orford
Gold Beach
Brookings
N
0 12.5 25 50 Kilometers
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.


SUMMER - multi-species seabird map
Oregon offshore call areas
(based on Leirness et al. 2021 data)
Oregon offshore wind call areas
Oregon Planning Area
Weighted sum summer mean - OR call areas
<VALUE>
1.323920965 - 2.295916184
2.295916185 - 3.294911271
3.294911272 - 4.077907419
4.07790742 - 4.968903037
4.968903038 - 5.99489799
5.994897991 - 8.2088871
101
Reedsport
Coos Bay
Coquille
Bandon
Myrtle Point
Cape Blanco
Port Orford
Gold Beach
Brookings
N
0 12.5 25 50 Kilometers
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.


FALL - multi-species seabird map
Oregon offshore call areas
(based on Leirness et al. 2021 data)
Oregon offshore wind call areas
Oregon Planning Area
Weighted sum fall mean - OR call areas
<VALUE>
2.169848919 - 3.151839195
3.151839196 - 3.783118658
3.783118659 - 4.344255958
4.344255959 - 4.905393258
4.905393259 - 5.50160164
5.501601641 - 6.641411781
101
Reedsport
Coos Bay
Coquille
Bandon
Myrtle Point
Cape Blanco
Port Orford
Gold Beach
Brookings
N
0 12.5 25 50 Kilometers
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.


WINTER - multi-species seabird map
Oregon offshore call areas
(based on Leirness et al. 2021 data)
Oregon offshore wind call areas
Oregon Planning Area
Weighted sum winter mean - OR call areas
<VALUE>
1.180294633 - 1.901933155
1.901933156 - 2.65363995
2.653639951 - 3.525619831
3.525619832 - 4.517872799
4.5178728 - 5.780740213
5.780740214 - 8.847703934
Reedsport
Coos Bay
Coquille
Bandon
Myrtle Poin
Cape Blanco
Port Orford
Gold Beach
Brookings
N
0 12.5 25 50 Kilometers
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Recommendations

Based on this multi-species analysis of seabird abundance in the proposed Call Areas, we make the following recommendations to avoid and minimize impacts to seabirds:

1. Remove the northern section of the Coos Bay Call Area from further consideration for FOSW development
2. Remove a minimum of 15km from the eastern side of both the Coos Bay and Brookings Call Areas from further consideration for FOSW development

Acknowledgments

We would like to recognize and thank the following people for their contributions with this analysis:

- David Perekstra, Avian Biologist, Bureau of Ocean Management, for reviewing species included in the analysis and suggesting additional considerations.
- Randy Dana, GIS Coordinator, Oregon Coastal Management Program, Oregon Department of Land Conservation and Development, for performing the GIS normalization and weighted sum analysis
- Deb Whitcomb, Portland Audubon volunteer / retired GIS Technician, for creating maps.
- Don Lyons, PhD, Director of Conservation Science, Audubon Seabird Institute, National Audubon Society & Assistant Professor Senior Research, Department of Fisheries, Wildlife, and Conservation Science, Oregon State University for consultation on results interpretation
- Sean Gordon, PhD, Research Scientist, Forest Program Lead Institute for Natural Resources, Portland State University for technical support on statistical considerations
- Jonathan Felis, Geographer, U.S. Geological Survey for technical support

Sources

Kelsey EC, Felis JJ, Czapanskiy M, Pereksta DM, Adams J. 2018. “Collision and displacement vulnerability to offshore wind energy infrastructure among marine birds of the Pacific Outer Continental Shelf.” *Journal of Environmental Management* 227: 229-247.

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