United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Memorandum

To: Director

From: Thomas Liu
Acting Regional Director, Pacific OCS Regional Office

THOMAS LIU Digitally signed by THOMAS LIU Date: 2021.07.16 09:44:53 -07'00'

Subject: Northern California Area Identification Pursuant to 30 C.F.R. § 585.211(b)

I. Purpose

This memorandum documents the analysis and rationale in support of the recommended designation of a Wind Energy Area (WEA) offshore Humboldt County, California for environmental analysis and consideration for leasing. Pursuant to Bureau of Ocean Energy Management's (BOEM) 2017 Program Delegations Handbook, the Director has final authority to designate WEAs at the end of the Area Identification (Area ID) process.

II. Area Identified

On October 19, 2018, BOEM published a Call for Information and Nominations for Commercial Leasing for Wind Power Development on the Outer Continental Shelf (OCS) Offshore California (Call). BOEM delineated three geographically distinct Call Areas: Morro Bay and Diablo Canyon off the central coast and Humboldt off the north coast. This memorandum provides a recommendation for the north coast WEA consisting of the Humboldt Call Area in its entirety, as described in Table 1 and depicted in Figure 1. The Humboldt Call Area—i.e., the recommended Humboldt WEA—begins at 21 miles offshore the City of Eureka in northern California. The area is approximately 28 miles in length from north to south and approximately 14 miles in width from east to west. The entire area is approximately 206 square miles (132,369 acres). BOEM will continue analysis of the Morro Bay and Diablo Canyon Call Areas and may provide recommendations for WEA(s) offshore central California in the future.

Table 1: *Recommended Humboldt Wind Energy Area Descriptive Statistics*

Acres	*Installation Capacity*[1]	*Homes powered*[2]	*Power Production (MWh/year): 40% Capacity Factor*[3]	*Power Production (MWh/year): 60% Capacity Factor*[4]	*Maximum Depth (meters)*	*Minimum Depth (meters)*
132,369	1,605	561,750	5,632,920	8,435,880	1,100	500

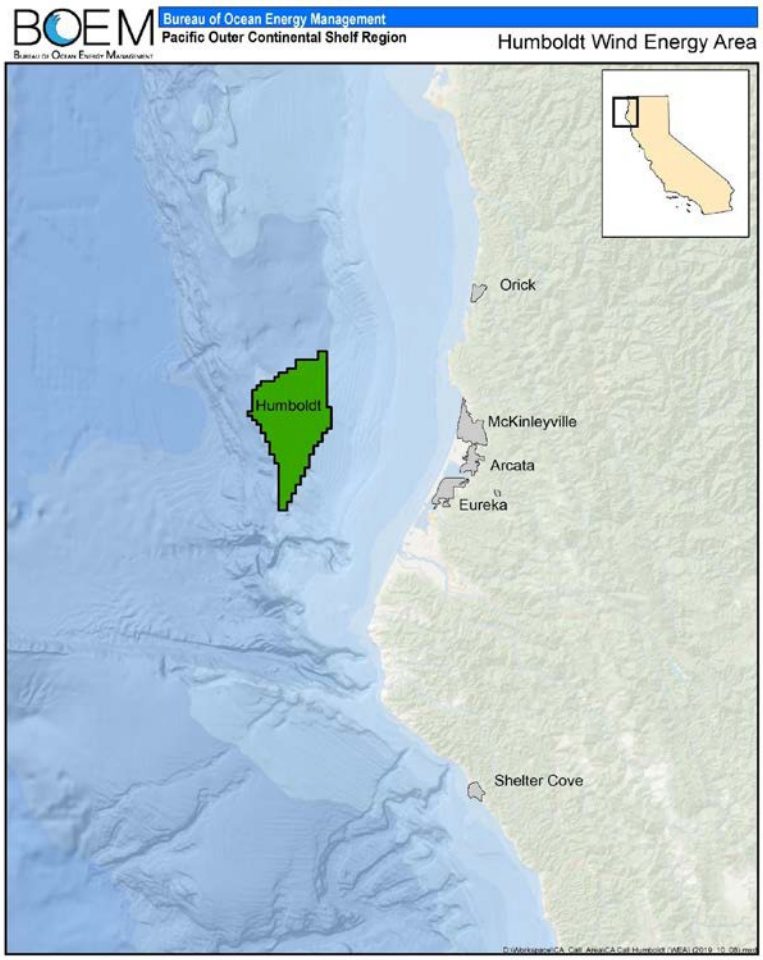

Figure 1: *Map of Recommended Humboldt Wind Energy Area (Humboldt Call Area).*

[1] Megawatts (MW) based upon 3 MW/sq km
[2] Homes powered based upon 350 homes per MW
[3] Formula = Capacity (MW) x 8,760 (hrs/yr) x 0.4 (capacity factor)
[4] Formula = Capacity (MW) x 8,760 (hrs/yr) x 0.6 (capacity factor)

III. Legal Standard

Pursuant to subsection 8(p) of the Outer Continental Shelf Lands Act (OCSLA), the Secretary of the Interior (the Secretary), in consultation with the U.S. Coast Guard (USCG) and other relevant federal agencies, may grant a lease, easement, or right-of-way on the OCS for activities that produce or support production of energy from sources other than oil and gas (43 U.S.C. § 1337(p)(1)(C)). The Secretary must ensure that activities under this subsection are carried out in a manner that provides for 12 specific enumerated requirements, including safety, protection of the environment, and consideration of other uses of the sea or seabed. *Id.* § 1337(p)(4)(A)–(L). BOEM has issued regulations governing the leasing process and management of offshore renewable energy projects. *See* 74 Fed. Reg. 19,638 (Apr. 29, 2009); *see also* 30 C.F.R. part 585.

This memorandum documents BOEM's consideration of OCSLA environmental and multiple use factors at the Area ID stage of its leasing process (43 U.S.C. § 1337(p)(4)(A), (B), (C), (D), (F), (I), and (J)). The identification of WEAs for environmental analysis does not constitute a final leasing decision, and BOEM reserves the right under its regulations to issue leases in smaller areas, fewer areas, different areas, some combination of these, or to issue no leases. BOEM will conduct further analysis under OCSLA and the National Environmental Policy Act (NEPA) at subsequent stages of its regulatory process, including if and when leases are offered for sale, and if and when wind energy facilities are proposed on any leases.

IV. Description of the BOEM Process

A. Planning and Analysis

At the request of Governor Jerry Brown, BOEM established an Intergovernmental Renewable Energy Task Force (Task Force) with California in 2016 to facilitate coordination among relevant federal agencies and affected state, local and tribal governments throughout the leasing process. The first Task Force meeting was held on October 13, 2016, and a second Task Force meeting was held on September 17, 2018.

Following the first Task Force meeting and through the leadership of the California Energy Commission (CEC), BOEM and the State of California engaged in a collaborative, data-based offshore wind energy planning process to foster coordinated and informed decisions about California's shared ocean resources and the many users who depend on them. This outreach consisted of numerous public meetings, webinars, and briefings with coastal communities, fishing communities, federally and non-federally recognized tribes, state and federal agencies, academia and scientists, environmental non-governmental organizations (NGOs), and the offshore renewable energy industry. A summary of key findings is contained in the Outreach Summary Report - California Offshore Wind Energy Planning, published in December 2018.[5] Additional information gathered by BOEM and the State of California during the offshore wind

[5] Outreach Summary Report – California Offshore Wind Energy Planning (Updated). BOEM and the California Energy Commission, December 2018. https://www.boem.gov/renewable-energy/state-activities/public-information-meetings-and-outreach-efforts

energy planning process, including maps and spatially represented data, is available online at https://caoffshorewind.databasin.org/.

Data and information gathered during outreach efforts inform BOEM of potential conflicts with existing ocean uses, viewshed, fishing, and indicate potential impacts to avian and marine mammal species, which generally increase with closer proximity to shore.

B. Call for Information and Nominations

The competitive leasing process starts with the publication of a Call, which requests comments from the public about areas of the OCS that it believes should receive special consideration and analysis for the potential development of renewable energy (30 C.F.R. § 585.211(a)).

On October 19, 2018, BOEM published a Call.[6] BOEM delineated three Call Areas in consultation with numerous parties and information sources, including the State of California and the Task Force. A map of the Call Areas is in Figure 2. In addition to soliciting public comments in the *Federal Register*,[7] BOEM hosted a public meeting on December 13, 2018, in San Luis Obispo, California, with participation from members of the Task Force and the public, as well as other representatives from relevant federal, state, and local government entities.

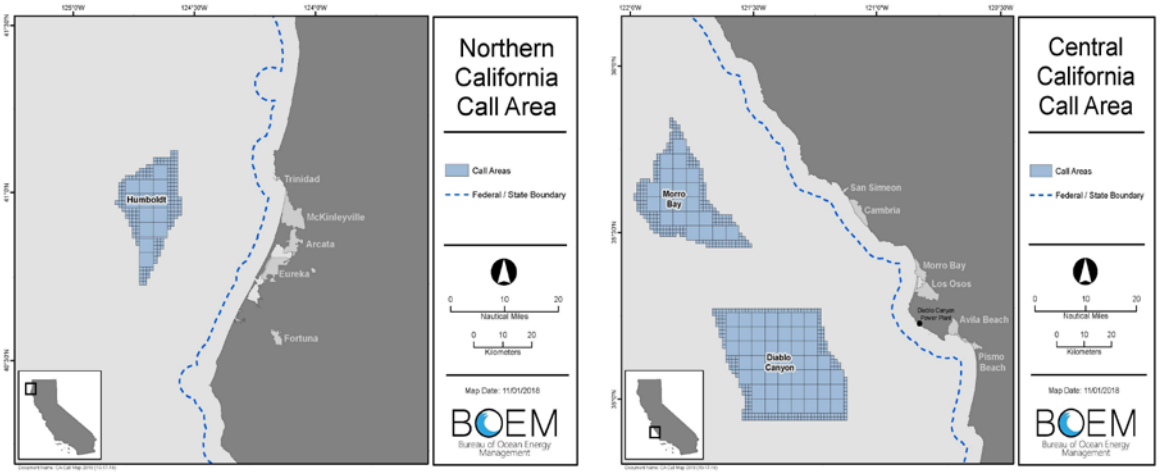

Figure 2: *California Call Areas.*

C. Area Identification

Area ID is a required regulatory step under the renewable energy competitive leasing process used to identify areas for environmental analysis and consideration for leasing.[8] *See* 30 C.F.R.

[6] https://www.boem.gov/83-FR-53096/
[7] https://www.regulations.gov/docket?D=BOEM-2018-0045
[8] *See* 30 C.F.R. § 585.211(b).

§ 585.211(b). The goal of BOEM's Area ID process is to identify the offshore locations that are the most suitable for leasing. The Area ID process balances consideration of multiple competing uses and environmental concerns against a proposed area's potential for commercial wind energy development. BOEM analyzes potential impacts of a specific proposed renewable energy facility in the identified areas during the review of a proposed Construction and Operations Plan (COP), when project-specific information is available.

The Call comment period ended on January 28, 2019. BOEM received 118 comments and 14 companies provided nominations of interest. Comments received in response to the Call are available at https://www.regulations.gov/ [Docket No. BOEM–2018–0045] and include submissions from private citizens; federal, state, and local government agencies; tribal governments; environmental and other advocacy groups; industry groups; and wind developers. During the Area ID process, BOEM considered the following non-exclusive list of information sources:

- Comments and nominations received in response to the Call
- BOEM California Intergovernmental Renewable Energy Task Force meetings
- Outreach Summary Report - California Offshore Wind Energy Planning[9]
- Input from state and federal agencies
- Tribal outreach meetings with federally and non-federally recognized tribes, led by the CEC
- Comments from relevant stakeholders, including the maritime community, environmental NGOs, offshore wind developers, and commercial fishing industry
- State and local renewable energy goals
- Domestic and global offshore wind market and technological trends
- California Offshore Wind Energy Gateway[10] data and information

D. Environmental Review Process following Area ID

After Area ID and prior to a lease sale, BOEM will conduct an environmental review pursuant to NEPA to assess the potential environmental impacts associated with leasing some or all of the WEA.[11] The Area ID process informs the environmental review process by identifying and informing the geographic scope of that environmental analysis for any future lease sales in the area. If BOEM holds a lease sale for some or all of the WEA, the issuance of a lease would grant to the lessee the exclusive right to submit for BOEM's review a plan proposing development of the leasehold. The lease itself does not authorize any activity within the lease area unless and until a lessee submits a proposed plan to BOEM and BOEM approves it, potentially with modifications.

Therefore, BOEM does not consider the issuance of a lease to constitute an irreversible and irretrievable commitment of agency resources toward the construction of a wind energy facility. BOEM will perform an environmental analysis, typically in the form of an Environmental Assessment (EA), and conduct associated consultations before any lease sale.

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[9] https://www.boem.gov/California-Outreach-Summary-Report/

[10] https://caoffshorewind.databasin.org/

[11] 42 U.S.C. §§ 4321 *et seq*.

These analyses will consider only the potential impacts from site characterization activities (such as biological, geological, geotechnical, and archaeological surveys) and site assessment activities (such as meteorological and oceanographic buoy deployment). The environmental analysis would also examine the potential cumulative effects from these activities when added to other past, present, and reasonably foreseeable future actions within and near the potential lease area.

Department of the Interior (DOI) regulations require public involvement, to the extent practicable, in the preparation of an environmental analysis.[12] Under the current Council on Environmental Quality regulations, departments are directed to complete their EAs within 75 pages and 1 year from the date of agency decision to prepare an environmental assessment.[13] Through the public involvement process, which could include public scoping meetings, BOEM would identify a reasonable range of alternatives to the proposed action of leasing in the WEAs, and would analyze those alternatives in the EA. The EA and associated consultations may identify potential lease stipulations to reduce or eliminate potential negative environmental impacts associated with site characterization and site assessment activities.

E. Future Steps in BOEM Leasing Process

If BOEM decides to move forward with the leasing process upon completion of its environmental analysis, BOEM would publish the proposed area(s) for lease, associated terms and conditions, and a proposed format of the competitive auction in a Proposed Sale Notice (PSN) issued pursuant to 30 C.F.R. § 585.216. A formal public comment period follows issuance of the PSN. BOEM will review any comments received to help develop the final lease sale terms and conditions published in the Final Sale Notice (FSN). BOEM may use information from its environmental analysis, as well as information gathered in response to the PSN, to further refine lease areas and develop lease terms and conditions.

If a lease is issued and a lessee submits a proposed COP for that lease, BOEM would perform the necessary consultations with the appropriate state, federal, local, and tribal entities; solicit input from the public and Task Force members; and perform an independent, comprehensive, site- and project-specific environmental analysis under NEPA. This separate site- and project-specific environmental analysis for a proposed COP would provide additional opportunities for public involvement. BOEM would use this information to evaluate the potential environmental and socioeconomic impacts associated with the proposed project, which would inform its decision to approve, approve with modification, or disapprove a lessee's proposed COP pursuant to 30 C.F.R. § 585.628.

V. Background on the Call Area

A. California's Renewable Energy Goals

The State of California is the most populous state in the United States and home to an estimated 39 million people[14] and two of the top ten largest metropolitan population centers in the United

[12] 43 C.F.R. § 46.305.

[13] *See* 40 C.F.R. §§ 1501.5(f) and 1501.10(b)(1).

[14] https://data.census.gov/cedsci/

States,[15] representing significant energy demand. In 2002, the State of California established a Renewables Portfolio Standard (RPS), which mandates that a certain percentage of the state's energy must be generated from renewable resources. California expanded the RPS in 2015 through passage of California Senate Bill 350 , the Clean Energy and Pollution Reduction Act, and in 2018 through passage of California Senate Bill 100 (SB 100). SB 100 increases the state's existing RPS to 50 percent by 2025 and 60 percent by 2030 and requires that 100 percent of the state's electricity be generated using zero-carbon resources by December 31, 2045. California's RPS is one of the most ambitious renewable energy standards in the country.

In addition, California aims to be carbon-neutral by 2045.[16] Because of these state policies and goals, California has been investing heavily in renewable energy generation since 2014, primarily in solar energy. At the same time, California is decreasing its generation of nuclear energy, and forecasts that the last nuclear power plant in the state will be offline by 2025,[17] representing a loss of approximately 10 percent of in-state energy production.[18]

Diversifying renewable energy generation can help reduce the cost for California to meet its renewable energy targets, and offshore wind can complement the state's vast solar and land-based wind resources. Figure 3 shows how offshore wind may help mitigate challenges associated with the "Duck Curve."[19] This figure shows net loads (modeled loads minus land-based wind and solar generation) on March 31 in years 2012–2020.[20] As more solar generation is added to the grid during this time, it is able to meet an increasingly large portion of daytime load, but the grid also requires increasing amounts of other generation to ramp up and meet evening peaks as the sun goes down. Preliminary investigation of possible California offshore wind sites indicates that available offshore wind peaks in the late afternoon into the evening, with substantial generation throughout the evening hours. Diversifying the state's renewable energy portfolio with offshore wind could reduce evening ramping requirements and advance the state's goal of 100 percent carbon free electricity by 2045.[21]

[15] https://www.census.gov/content/dam/Census/newsroom/releases/2015/cb15-89_graphic.jpg

[16] California Senate Bill No. 100, approved September 10, 2018. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

[17] California ISO website, https://caiso.com/Documents/AnnouncedRetirement_MothballListPosted.html.

[18] California Energy Commission website, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation/2018.

[19] The Duck Curve is a graph of power production over the course of a day that shows the timing imbalance between peak demand and renewable energy production. The term was coined in 2012 by the California Independent System Operator and refers to the shape of the load curve for solar power

[20] California Independent System Operator, 2016. *Fast Facts: What the Duck curve tells us about managing a green grid.* Folsom, CA. https://www.caiso.com/documents/flexibleresourceshelprenewables_fastfacts.pdf

[21] Ibid, 20.

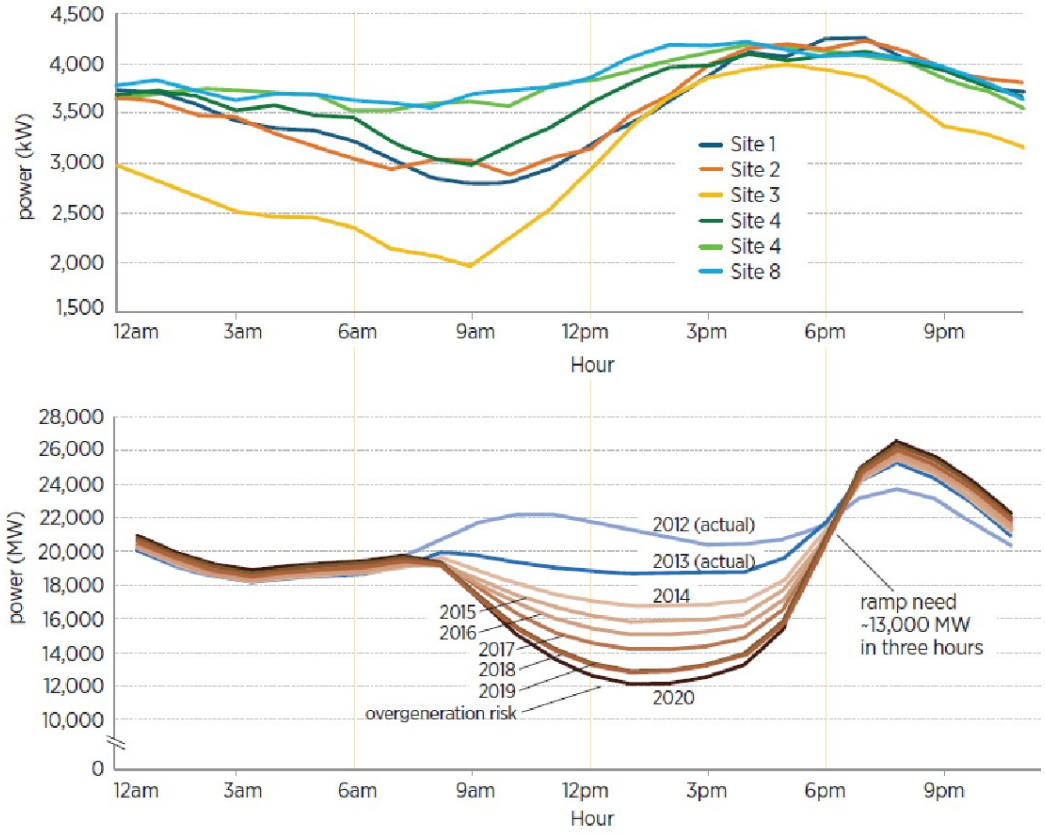

Figure 3*: The "Duck Curve" and modeled generation profiles for 6 MW offshore wind turbines at six California sites.*

In addition to the state's goals, the Redwood Coast Energy Authority (RCEA), a local government joint power authority serving Humboldt County, is actively pursuing a procurement goal of 100 percent locally sourced renewable electricity by 2030, including offshore wind energy. In 2018, RCEA selected partners for a public-private partnership to further explore developing wind energy offshore northern California.[22] RCEA administers Humboldt County's Community Choice Energy program. Community Choice Energy, sometimes known as Community Choice Aggregation (CCA), is a model that allows communities to join together to purchase electricity on behalf of their community members.

B. Technical Criteria: A Buildable Environment

The Humboldt Call Area meets key technical criteria generally used to determine the appropriateness of floating offshore wind energy development. These include sustainable wind speeds, suitable water depths, access to existing transmission interconnection, and robust renewable energy demand, as discussed below.

[22] Redwood Coast Energy Authority website, https://redwoodenergy.org/community-choice-energy/about-community-choice/power-sources/offshore-wind-energy/

Sustainable Wind Speeds: The average estimated wind speed at 100 meters above sea level within the Humboldt Call Area is 9.2 meters per second, as depicted in Figure 4. This exceeds average wind speeds of several commercial developments in the North Sea in Europe.[23]

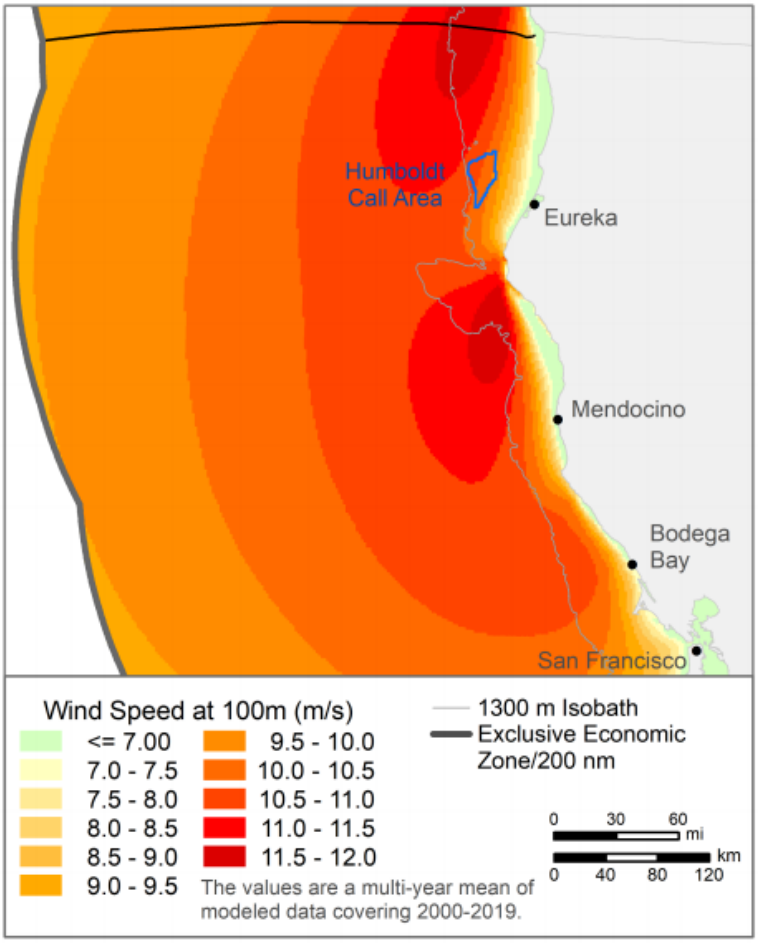

Figure 4: *Estimates of the Annual Average Wind Resource (Speed) at 100 meters above sea level for the Humboldt Call Area.*

Water Depths: The water depths in the Humboldt Call Area, which range from 500 to 1,100 meters, are technically feasible for several types of floating foundations. These water depths make pile-driven foundations (e.g., monopile or jacket) infeasible in any of the previously mentioned Call Areas.[24]

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[23] Coelingh, van Wijk, and Holtslag *Analysis of wind speed observations on the North Sea coast.* (1998, February) Journal of Wind Engineering and Industrial Aerodynamics. Retrieved from https://www.sciencedirect.com/science/article/pii/S0167610597002857?via%3Dihub

[24] Arent, Douglas et al. *Improved Offshore Wind Resource Assessment in Global Stabilization Scenarios.* NREL/TP- 6A20-55049. https://www.nrel.gov/docs/fy13osti/55049.pdf

Proximity to Transmission: The Humboldt Call Area is sufficiently close to existing transmission infrastructure to easily interconnect to the electrical grid. The Humboldt Call Area is approximately 21 miles from the Humboldt Generating Station in Eureka, as shown on Figure 5. Full buildout of the Humboldt Call Area will require interconnection upgrades and interconnecting to the bulk electric power system will require review by the California Independent System Operator (CAISO). California recognizes that analysis and subsequent approvals of transmission facilities would be necessary to achieve the state's RPS and clean energy goals. SB 100 requires the CEC, California Public Utilities Commission (CPUC), and California Air Resources Board (CARB) to complete a joint agency report to the California legislature evaluating the 100 percent zero-carbon electricity policy to address the requirements and intent of the statute. BOEM is also funding an analysis by Humboldt State University to further understand grid interconnection on the north coast.

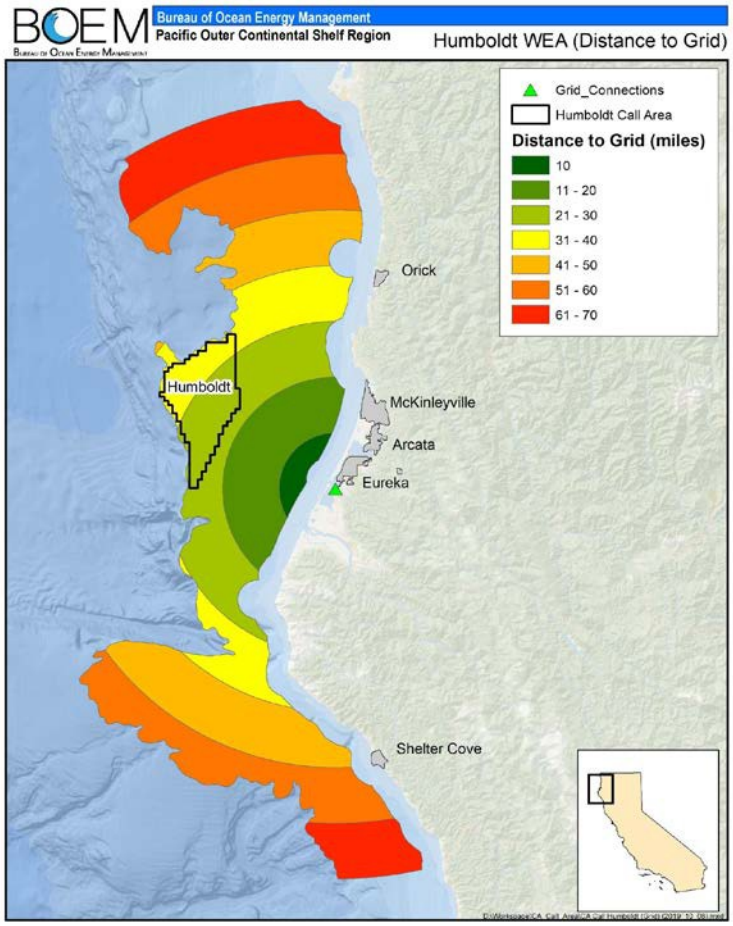

Figure 5: *Transmission Interconnection Locations for the California Call Areas.*

Robust Energy Demand: As mentioned above, RCEA is actively pursuing a procurement goal of 100 percent locally sourced renewable electricity by 2030, including offshore wind energy.

C. Nominations

In response to the Call, BOEM received nominations of interest from 14 qualified entities proposing to develop offshore wind in all three Call Areas as listed below. Ten of the 14 companies submitted nominations of interest for the Humboldt Call Area as shown in Figure 6 below. Several companies noted in their submissions that, while they were nominating a specific area, they would be interested in any area that BOEM offered to lease offshore California.

1. Algonquin Power Fund (America) Inc.
2. Wpd Offshore Alpha, LLC
3. Avangrid Renewables, LLC
4. Castle Wind, LLC
5. Cierco Corporation
6. EDF Renewables Development, Inc.
7. EDP Renewables North America, LLC
8. E C & R (eON) Development, LLC
9. Equinor Wind US, LLC
10. Mission Floating Wind, LLC
11. Northcoast Floating Wind, LLC
12. Northland Power America, Inc,
13. RCEA
14. U.S. Mainstream Renewable Power, Inc.

Additional information about each nomination, including maps, nomination rationales, and OCS block tables are available here: https://www.boem.gov/California-Call-for-Nominations/.

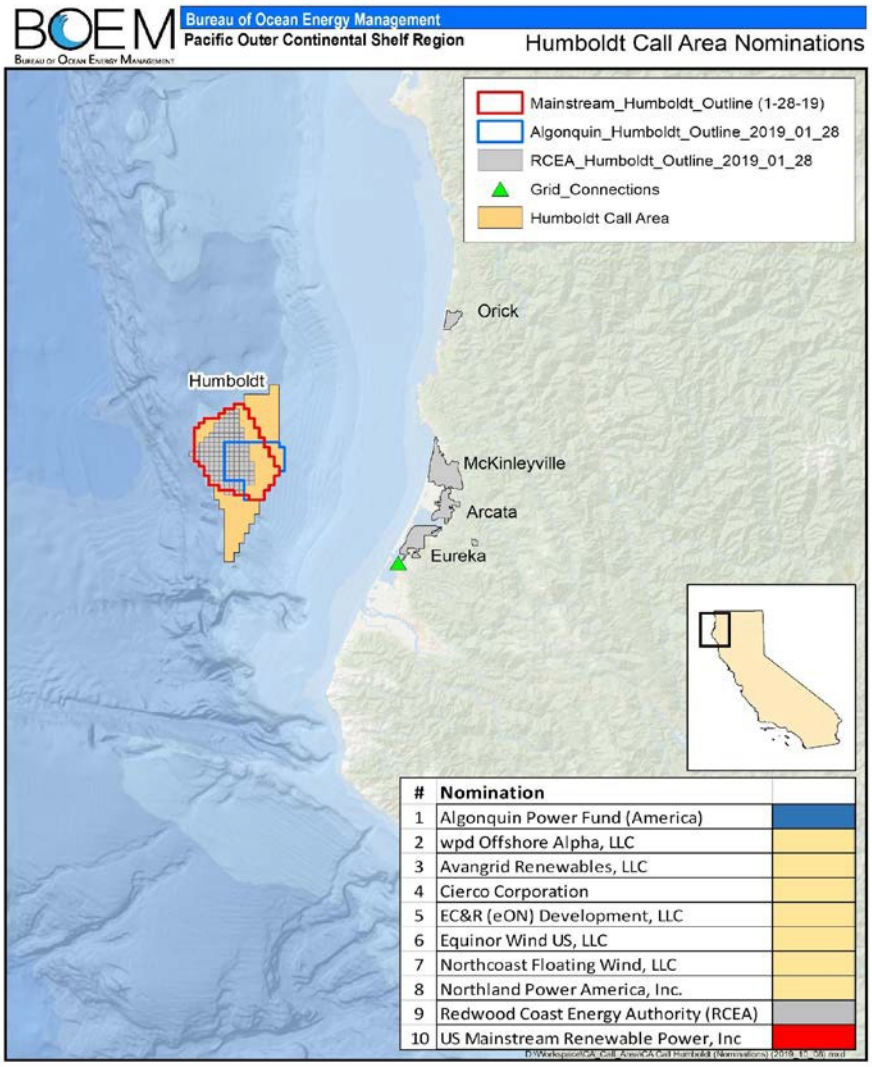

Figure 6: *Nominations Received on the Humboldt Call Area.*

VI. Considerations for Area ID

BOEM considered multiple existing uses of the area in and around the Humboldt Call Area, and their impact on the designation and commercial viability of a WEA within the area. The uses found to interact most with potential wind development within the Humboldt Call Area are: (1) commercial and recreational fishing, (2) avian species, (3) marine mammals, (4) vessel traffic, (5) historic properties, (6) visual impacts, and (7) military activities. Highlights of our internal analysis are included in the sections below.

A. Multiple Uses

1. Commercial and Recreational Fishing

The goal of BOEM's Area ID is to identify the offshore locations that appear most suitable for wind energy development and on which BOEM will conduct NEPA review for lease issuance.

Given the ubiquity of fishing activity along the Pacific Coast (as depicted on Figure 7), no single exclusion area or mitigation approach would resolve all potential commercial fishing conflicts. Some areas important to one sector of the industry may not be important to others, and currently no available information indicates fishing grounds within the Call Area that are either marginal or notably valuable. Moreover, and as discussed further below, fisheries' economic productivity declines with depth and distance from shore.

The waters offshore California support numerous types of fishing (as depicted on Figure 7), and stakeholders place high cultural and economic significance on these activities. Within the last decade (2009-2018), the ex-vessel value of all marine commercial fisheries within California averaged approximately $216 million dollars per year (See Table 2). Within this same period, the Eureka-area port complex (EPC) contributed about 18 percent to this total and is second only to the Santa Barbara Channel port complex in significance to the state. Within the EPC, commercial fishers primarily land their catch at three major harbors (Eureka, Trinidad, and Crescent City), and use several smaller locations with less consistency. As shown on Table 2, within the EPC, crab dominates the economic value of landings at all ports. Eleven other taxa recorded at least 1 percent of value landed at one or more of the local harbors.

Table 2. Ex-vessel value (2019$) of landings for some California commercial fisheries

	Average Annual Ex-vessel Landings Value (2019$) 2009-2018*	Statewide Value %	Regional EPC Value %	Local Harbor Value %	Depth (m) or Offshore Range (km) of Potential Fishing Grounds†	Call Area Overlaps with Potential Fishing Grounds?
California Statewide	**$ 216,128,424**	**100%**				
Eureka Port Complex (EPC)	**$ 38,907,766**	**18%**	**100%**			
Eureka Harbor	**$ 14,762,368**	**7%**	**38%**	**100%**		
Dungeness crab	$ 8,451,701	4%	22%	57%	less than 230 m	No
Sablefish	$ 1,870,730	< 1%	**5%**	**13%**	**57 to 1524 m**	**Yes**
Dover Sole	$ 1,289,162	< 1%	**3%**	**9%**	**27 to 914 m**	**Yes**
Ocean (pink) shrimp	$ 661,688	< 1%	2%	4%	73 to 229 m	No
Petrale sole	$ 547,548	< 1%	1%	4%	18 to 460 m	No
Thornyheads	$ 494,852	< 1%	**1%**	**3%**	**26 to 1524+ m**	**Yes**
Albacore tuna	$ 391,040	< 1%	1%	3%	greater than 55 km offshore	No
Chinook salmon	$ 306,987	< 1%	< 1%	**2%**	**0 to 46 km offshore**	**Yes**
Night/Surf smelt	$ 201,904	< 1%	< 1%	1%	surf zone	No
All other species	$ 546,756	< 1%	1%	4%		
Trinidad Harbor	**$ 2,547,544**	**1%**	**7%**	**100%**		
Dungeness crab	$ 2,514,008	1%	6%	99%	less than 230 m	No
All other species	$ 33,536	< 1%	< 1%	1%		
Crescent City Harbor	**$ 19,511,137**	**9%**	**50%**	**100%**		
Dungeness crab	$ 15,144,538	7%	39%	78%	less than 230 m	No
Ocean (pink) shrimp	$ 2,716,064	1%	7%	14%	73 to 229 m	No
Sablefish	$ 410,664	< 1%	**1%**	**2%**	**57 to 1524 m**	**Yes**
Coonstripe shrimp	$ 343,493	< 1%	< 1%	2%	less than 185 m	No
Black rockfish	$ 216,766	< 1%	< 1%	1%	less than 366 m	No
All other species	$ 679,612	< 1%	2%	3%		
All other locations	**$ 1,483,021**	< 1%	**4%**	**100%**		
Dungeness crab	$ 992,994	< 1%	3%	67%	less than 183 m	No
Hagfishes	$ 348,353	< 1%	< 1%	**23%**	**9 to 732 m, generally less than 549 m**	**Yes**
Chinook salmon	$ 102,334	< 1%	< 1%	**7%**	**0 to 46 km offshore**	**Yes**
All other species	$ 39,340	< 1%	< 1%	3%		

* Landing data downloaded from https://www.wildlife.ca.gov/Fishing/Commercial/Landings and adjusted to June, 2019 values using the Consumer Price Index Inflation Calculator https://data.bls.gov/cgi-bin/cpicalc.pl.

† Depth data obtained from (1) *Status of the Fisheries* reports at https://www.wildlife.ca.gov/Conservation/Marine/Status for Dungeness crab, ocean (pink) shrimp, petrale sole, coonstripe shrimp, Pacific hagfish, and black rockfish, and (2) Miller and Lea 1976. *Guide to the Coastal Marine Fishes of California,* Calif. Dept. Fish and Game, Fish Bull. No. 157 (https://escholarship.org/uc/item/6s04v367), for sablefish, Dover sole, petrale sole, longspine and shortspine thornyheads, surf smelt, night smelt, and black hagfish. Albacore and Chinook offshore range obtained from Industrial Economics, Inc. 2012. BOEM OCS Study 2012-083. Original data converted to metric units when necessary.

The fisheries' economic productivity reflects biological productivity and is highest in shallower waters near the coast, declining as depth increases (See Figures 7 and 8). Given the OCS location of the Humboldt Call Area (See Table 9), a simple depth analysis reveals that many commercial fisheries are not likely to experience notable preclusion from fishing grounds as a result of wind energy development in the area. NOAA scientists used landing receipts and vessel monitoring system data during 2010-2016 to describe spatial patterns of fishing for Dungeness crab,[26] the most important local fishery at all harbors within the region (Table 2). The Call Area did not overlap with Dungeness crab fishing grounds described in this research.

[26] Feist, B.E., Samhouri, J.F., Forney, K.A., Saez, L.E. 2021. Footprints of fixed-gear fisheries in relation to rising whale entanglements on the US West Coast. Fisheries Management and Ecology 28(3): 283-294.

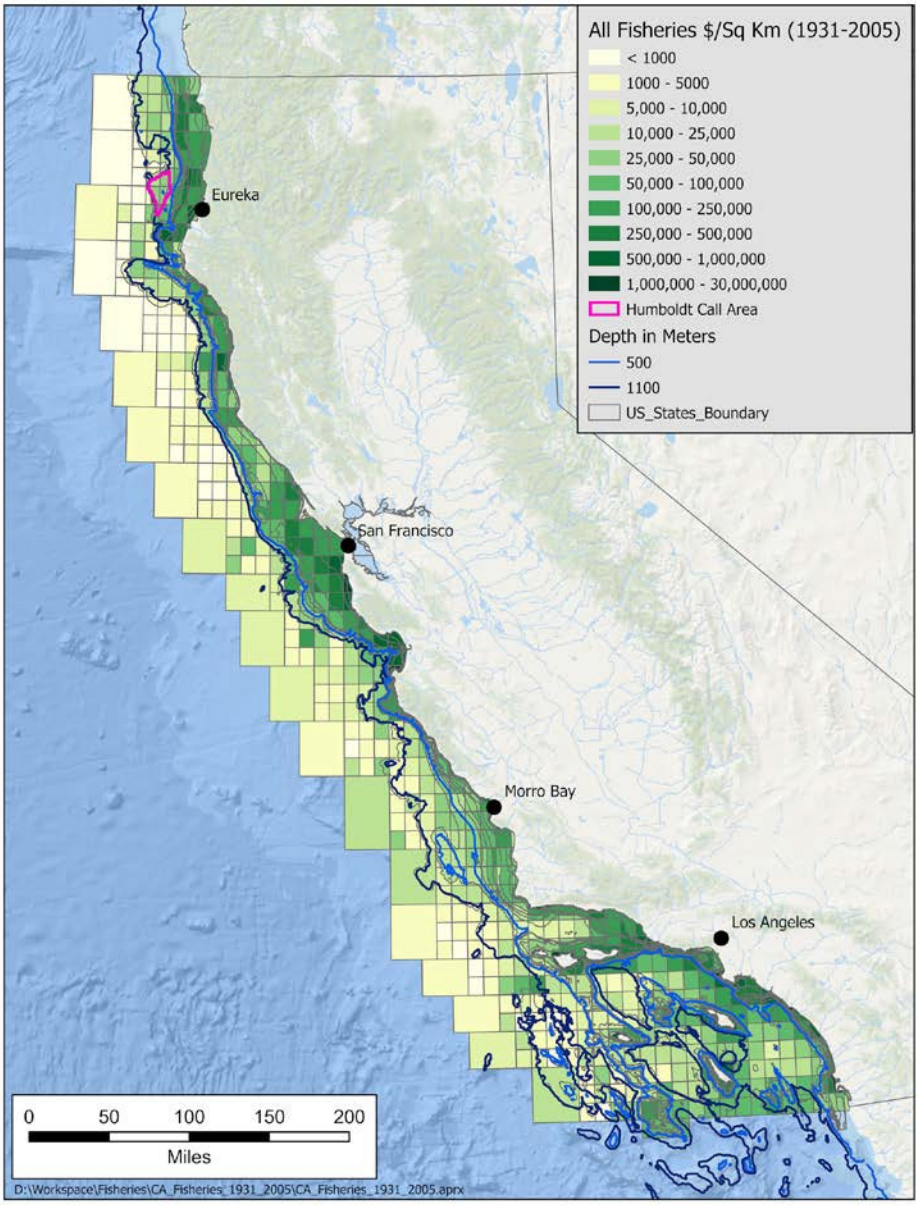

Figure 7*: (California Coast) Total monetary value of fisheries landings, 1931-2005, summarized from the California Department of Fish and Wildlife catch blocks. Adapted from Miller et al. 2017, Can. J. Fish. Aquat. Sci. 74:1732-48.*

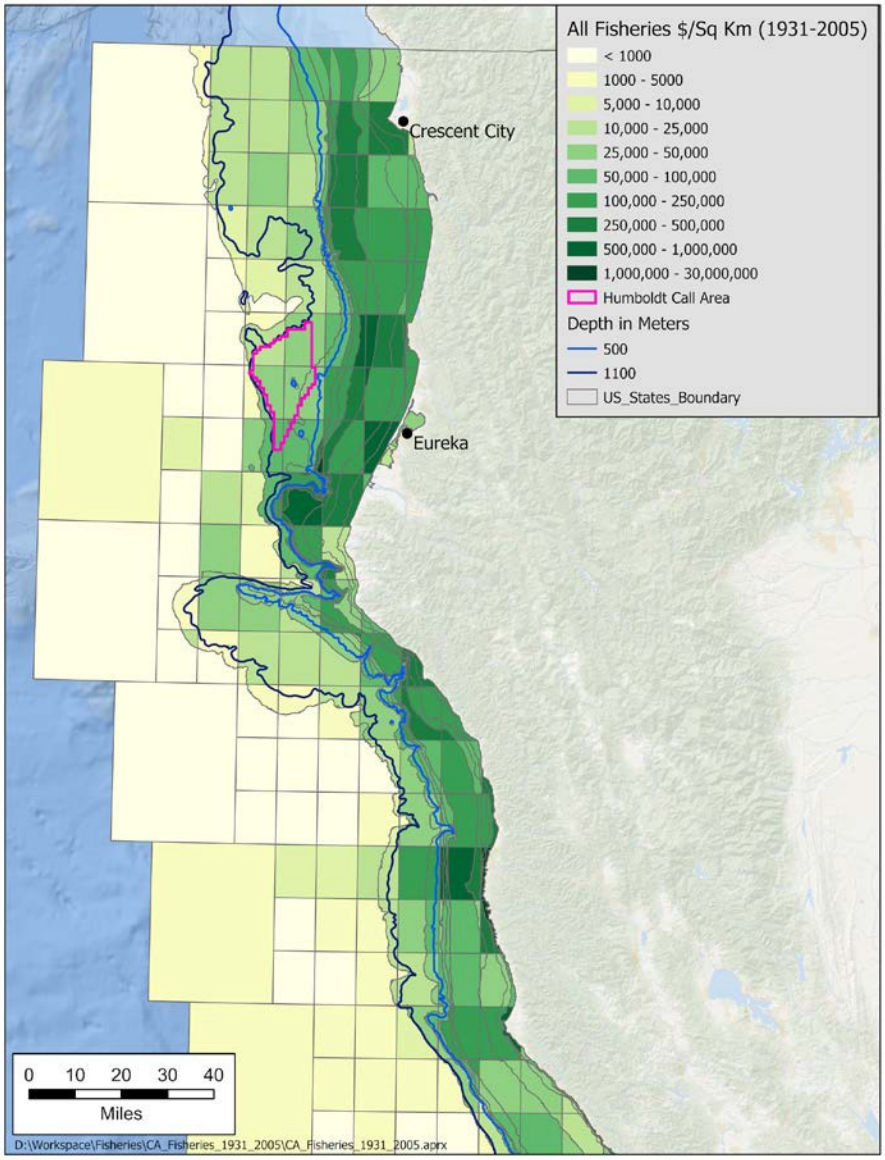

Figure 8*: (North Coast) Total monetary value of fisheries landings, 1931-2005, summarized from the California Department of Fish and Wildlife catch blocks. Adapted from Miller et al. 2017, Can. J. Fish. Aquat. Sci. 74:1732-48.*

Although offshore wind development on the OCS does not prevent fishing activities within OCS lease areas, floating wind facilities would likely be incompatible with certain gear and methods that fishers use to ply the deeper waters on the OCS offshore California (e.g., trawl, pot/trap, longline, nets). Fishing methods that employ hook-and-line gear (jigs, bait, or trolling) may be compatible with offshore wind. Therefore, even though Chinook salmon fishing grounds overlap with the Call Area, fishing activity is not expected to be precluded.

Recreational and tribal fishing are not expected to be negatively affected by offshore wind development in the Humboldt Call Area because recreational fishers rarely fish deeper than

200 meters and species targeted by tribes occur closer to shore.[25] As noted above and in Figure 9, the depth range within the Humboldt Call Area is between 500 meters to 1100 meters.

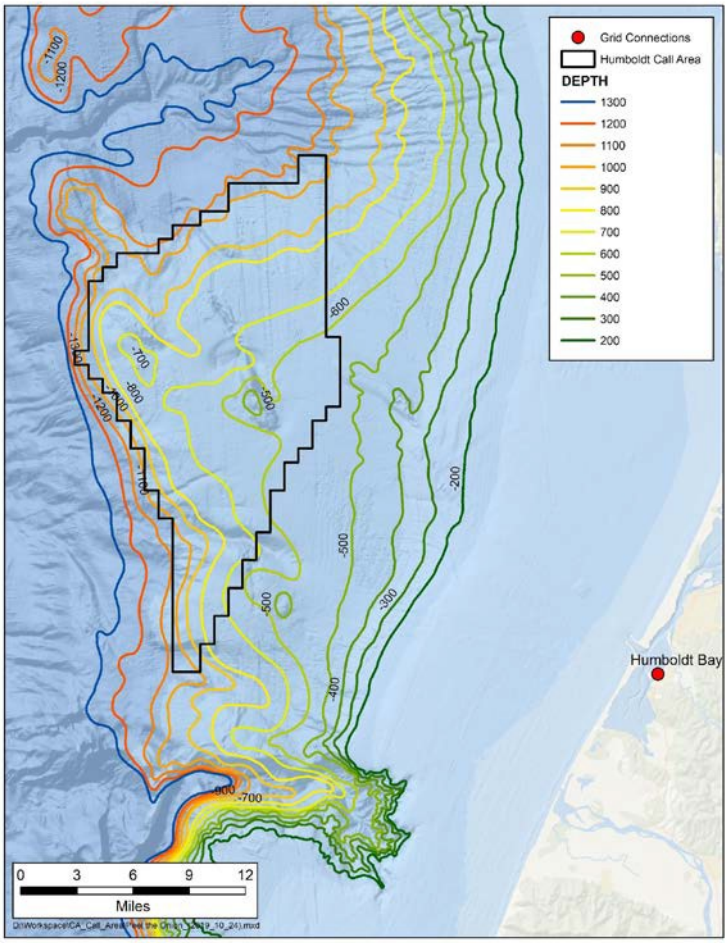

***Figure 9**: Humboldt Call Area Bathymetry.*

The majority of the comments from the fishing industry and fishing related communities received on the Call concern potential impacts from offshore wind on general fishing activities, availability of data on fishing activities, cumulative effects when combined with existing fishing restrictions, and effects on certain types of fishing, such as trawling. The Humboldt Fishermen's Marketing Association stated that they have signed a "Memorandum of Understanding" with RCEA to seek to work cooperatively to minimize and mitigate for potential impacts to their fishing community by offshore energy developments and suggested that BOEM consider community engagement in awarding leases.

[25] Miller et al. 2014, PLOS ONE 9(6): e99758. Five keystone taxa (abalone, clams, mussels, seaweed, and smelt) and marine and coastal areas of concern were identified by a study funded by California's State Coastal Conservancy as important for consumptive and non-consumptive uses by several North Coast Tribes during the baseline characterization for monitoring state Marine Protected Areas: Informing the North Coast MPA Baseline: Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems, A Collaborative Project Among: Tolowa Dee-ni′ Nation, InterTribal Sinkyone Wilderness Council, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe. May 2017. 56 pp. https://caseagrant.ucsd.edu/sites/default/files/39-Rocha-Final.pdf.

An individual asserted, in a comment submitted on the Call, that the available data, including Automatic Identification System (AIS) data, does not provide a complete picture of fishing activities. BOEM's analysis will not rely solely on AIS data. Several fishing industry groups suggested that consultation with relevant permitting agencies, such as National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and Oregon Department of Fish and Wildlife, would be helpful. BOEM consults with NMFS during environmental analyses throughout BOEM's leasing process BOEM is in ongoing conversations with CDFW. We did not receive any comments from out-of-state agencies during the Call comment period but will consult as necessary during subsequent environmental reviews. Members of the U.S. albacore fisheries suggested potential measures to minimize impacts to their operations.

In comments submitted to BOEM in response to the Call, NMFS recommended that prior to the installation and construction of any turbines and in the development of study plans to address potential effects to NMFS trust resources, BOEM and its lessee(s) should consult with NMFS at the earliest possible time to provide guidance in the collection of environmental baseline information. NMFS also recommended that BOEM and prospective wind power developers, along with other relevant state and federal permitting agencies, consult as needed with NMFS during the appropriate timeframe. NMFS did not provide any recommendations about the size of the Call Area, as a result of fisheries conflicts or otherwise.

BOEM will consider these comments, best management practices, and agency guidelines to evaluate impacts to the fishing industry at each step of the leasing process. As described in this section, depth analysis reveals that many commercial fisheries are not likely to experience notable preclusion from fishing grounds. Based on the foregoing, the information available on fishing activities does not warrant removal of areas from further review at this time.

2. Avian and Bat Species

BOEM's preliminary analysis based on our data synthesis and modeling efforts to date found that at least 16 seabird species are present at a level of relatively moderate density during at least one season in the Humboldt Call Area (primarily jaegers, gulls, albatrosses, storm petrels, and shearwaters). Approximately 28 other species occur in moderate densities inshore of the Humboldt Call Area (primarily grebes, alcids, gulls, terns, loons, cormorants, and pelicans) and approximately 7 species occur in moderate densities farther offshore of the call area (primarily phalaropes, jaegers, albatrosses, and petrels). These species are likely to occur in lower densities within the Humboldt Call Area. One of the species that occurs inshore of the call area, the Marbled Murrelet (*Brachyramphus marmoratus*), is listed as threatened under the Endangered Species Act (ESA). The federally threatened Western Snowy Plover (*Charadrius nivosus nivosus*) occurs on beaches along the Humboldt County coast, but is not likely to occur in the Humboldt Call Area itself. None of these species were found, or are expected to occur, at relatively high densities in the Humboldt Call Area.

Avian species-related comments in response to the Call focused primarily on potential impacts to avian species from the construction and operation of an offshore wind energy facility.

However, BOEM received several comments that were specific to the Humboldt Call Area. Several commenters recommended site-specific surveys and predictive mapping of species abundance and distribution, and further suggested BOEM contact researchers and others for relevant datasets that would provide more information to consider for analysis. There were also relevant comments on specific bird species that may be at risk in the Humboldt Call Area and suggestions were made to remove some areas and study other parts of the Humboldt Call Area further. Concerns were raised specific to the Black Brant (*Branta bernicla nigricans*), which has a significant wintering population in Humboldt Bay and may migrate through the Humboldt Call Area on its southbound migration. One commenter identified impacts to bats as a concern and suggested that BOEM consider those potential impacts.

BOEM is conducting and planning several studies that will be valuable in understanding avian resources within the Humboldt Call Area. BOEM is collaborating with the National Oceanic and Atmospheric Agency (NOAA) and U.S. Geological Survey (USGS) on a data synthesis and predictive modeling study of seabird distribution off the entire west coast out to the exclusive economic zone (EEZ) boundary. Work with USGS includes synthesizing telemetry data on a number of seabird species, including shearwaters. BOEM and the U.S. Fish and Wildlife Service (USFWS) plan to study Black Brant migration from their breeding grounds in Alaska to the west coast of North America, which would help to assess the potential impacts of offshore wind facilities on that species. BOEM is also planning a systematic study of offshore acoustic bat activity along the western continental U.S. and Hawaiian coastlines to determine the temporal and spatial distribution of bats, which will help BOEM evaluate the effects of proposed offshore wind energy development on them. In addition, the lessee would conduct site-specific avian surveys after lease issuance to describe the key species and habitat that may be affected by the proposed construction and operations prior to approval of any construction. Further, it is worth noting that many avian and bat mitigation measures and best management practices have been successfully employed across the offshore wind industry and incorporated into plan approvals.

BOEM concludes that it is premature to exclude areas during the Area ID stage while BOEM is conducting studies and processing data that would be valuable to understanding avian and bat resources within the Humboldt Call Area. Based on the status of current and planned studies, and the information evaluated from public comments, BOEM has determined that impacts to seabirds and bats should be addressed on a site-specific basis at the COP review stage.

3. Marine Mammals and Sea Turtles

The information provided below is intended to describe the state of the best available scientific knowledge regarding marine mammal distribution and biologically important areas (BIAs) in relation to the Humboldt Call Area. This information indicates that the Humboldt Call Area contains relatively lower incidence of marine mammals and sea turtles than other portions of the OCS offshore California, and thus does not warrant reduction of the area to be analyzed for potential leasing on this basis. Comments received from federal and state agencies, researchers, members of the public and NGOs[26] that relate to BOEM's selection of the Humboldt

[26] https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&D=BOEM-2018-0045

Call Area focused on concerns related to impacts to marine mammal migratory routes and access to Biologically Important Areas (BIAs) (Figure 10).

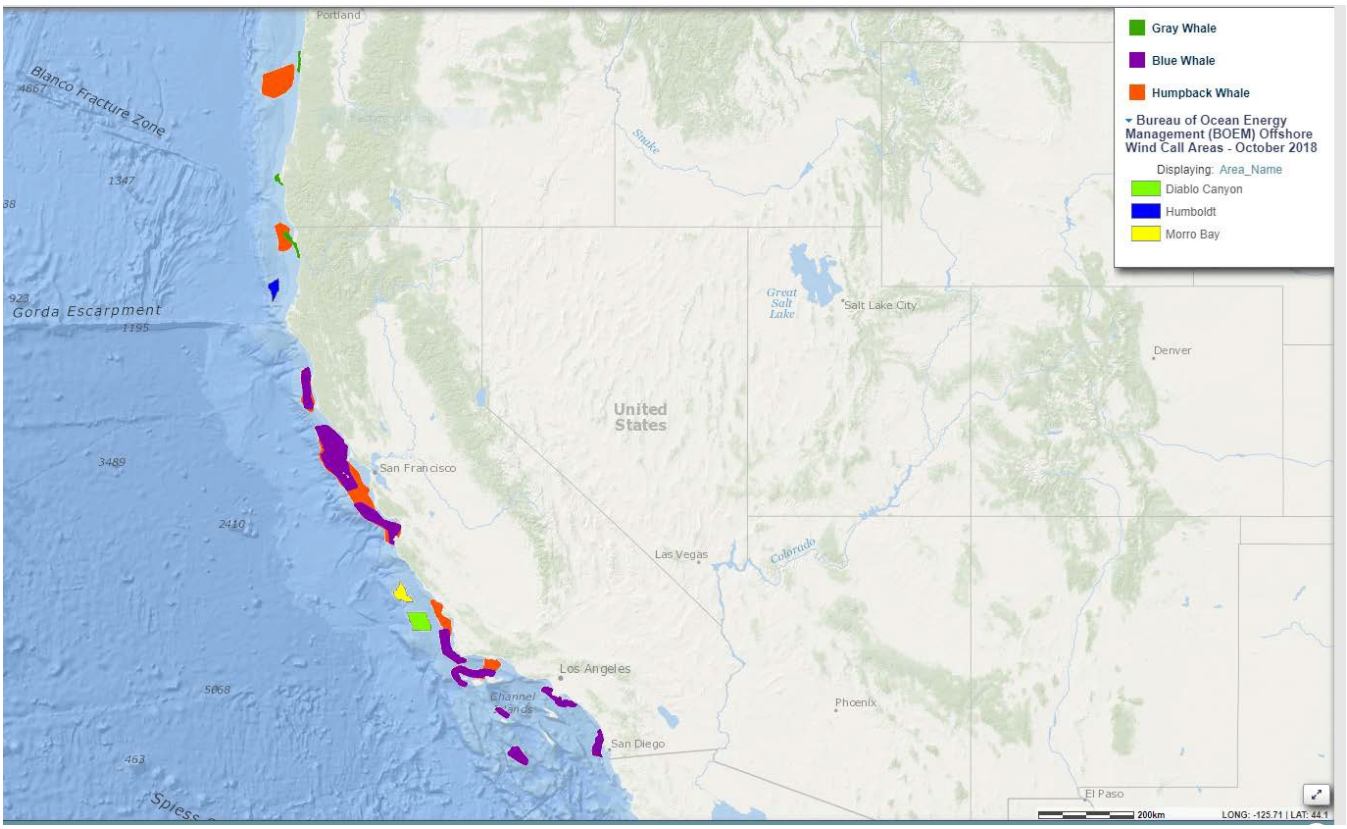

Figure 10: *Biologically Important Areas (feeding) for blue, humpback, and gray whales (Calambokidis et al., 2015) in relation to BOEM's Call Areas.*

The following marine species have been documented using migratory corridors or feeding areas or have critical habitat in proximity to the Humboldt Call Area. None of these species are expected to occur within the Humboldt Call Area in sufficient numbers to warrant elimination of some or all of the area from further analysis for potential leasing.

a) North Pacific Right Whales: Outside of the Bering Sea and Gulf of Alaska, from 1950-2001, there have been at least four sightings of North Pacific right whales from the eastern population from Washington, twelve from California, three from Hawaii, one from British Columbia, and two from Baja California, Mexico (Brownell et al. 2001). More recently, one North Pacific right whale was seen off La Jolla, CA in April 2017, and a different animal was sighted off the Channel Islands in May 2017. Farther north, there were two sightings off British Columbia in 2013 and one in June 2018 (NMFS, 2017). Sightings have occurred in Mexican waters and thus there is some evidence that North Pacific right whales travel through California waters to reach Southern California or Mexico in the summer months, though by what route and in what number species utilize this unconfirmed migratory route is unknown (NMFS, 2017).

Low numbers of sightings of individuals from a very small population makes any kind of demographic analysis challenging. Current knowledge of the low number of sightings offshore California in the last 68 years (14 sightings from 1950-2018, even with increased survey efforts), and the small population size (approximately 31 individuals), indicates that North Pacific right whales are unlikely to have any significant presence in the Humboldt Call Area.

b) Blue Whales: Blue whale habitat that overlaps with the Humboldt Call Area varies according to the data source; however, BOEM did not include any blue whale BIAs in the Humboldt Call Area. During August and September, WhaleWatch (Hazen et al., 2016) and other modeling efforts (Becker et al., 2016) on average predict 0-3 individual blue whales per 25x25 km area, designated as 'grid cells' in the WhaleWatch research. The Humboldt Call Area overlaps with approximately 4 grid cells but does not overlap with any core areas of use for blue whales (Figure 11).

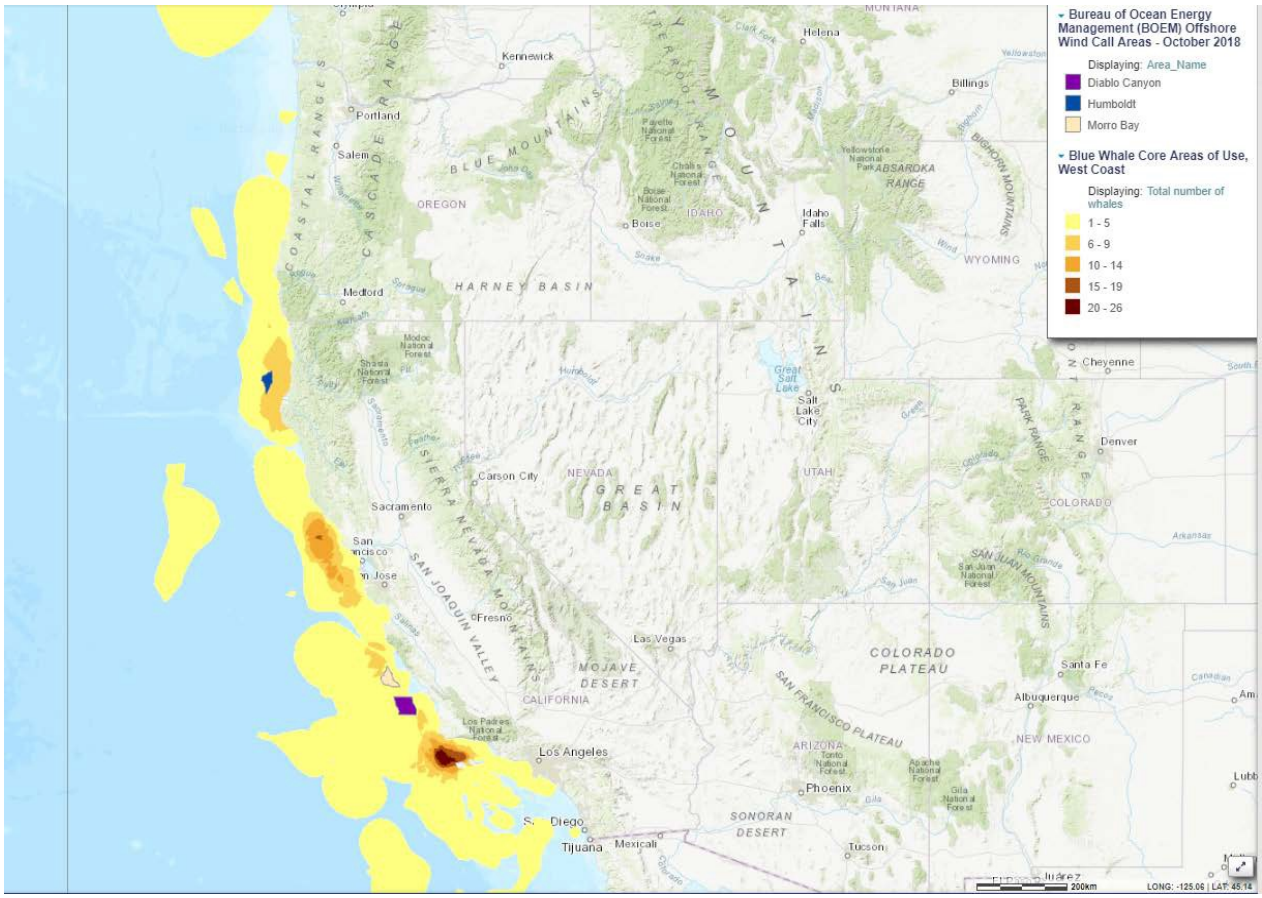

Figure 11: *Blue whale core areas of use along the west coast of the USA (Irvine et al., 2014) do not overlap with BOEM Call Areas.*

c) Fin Whales: Fin whales occur in both pelagic and coastal waters, where they feed primarily on krill and fish. Current research suggests that only some fin whales undergo long distance migrations, with some individuals remaining resident in warmer waters of

Southern California (Calambokidis et al., 2015). The variability in movements make BIAs difficult to define and thus none are designated by NMFS. Satellite tagging-based habitat suitability models suggest the Humboldt Call Area falls in a low density or low-moderate habitat suitability region in summer and fall (Becker et al., 2016; Scales et al., 2016) (Figure 12).

d) Humpback Whales: Concentrations of humpback whales increase with proximity to shore (Keiper et al., 2011). Humpback whale feeding BIAs occur approximately 10.8 nautical miles (nmi) closer to the shore than the Humboldt Call Area (Figure 10). NOAA Southwest Fisheries Science Center (SWFSC) density models, which are based on ship-based surveys, predict the Humboldt Call Area to overlap with regions of high or moderate density ($\leq$1 animal per square kilometer (km^2) for a study area 1,141,800 km^2) for humpback whales (Becker et al., 2012; 2016). However, it should be noted that humpbacks were not sighted in that area during any of the six cruise years (Becker et al., 2012; 2016).

e) Gray Whales: Gray whale feeding BIAs occur on the OCS and in coastal nearshore waters further north of the Humboldt Call Area, primarily in Washington and Oregon (Calambokidis et al., 2015). As such, the Call Area does not overlap with gray whale feeding BIAs. Similarly, migratory corridors occur close to shore (within 5.4 nmi) (see Figure 13). It is important to note that in defining BIAs, Calambokidis et al. (2015) included a 25.4 nmi buffer (see Figure 12). The buffer represents the potential path of some individuals that move farther offshore during annual gray whale migrations.

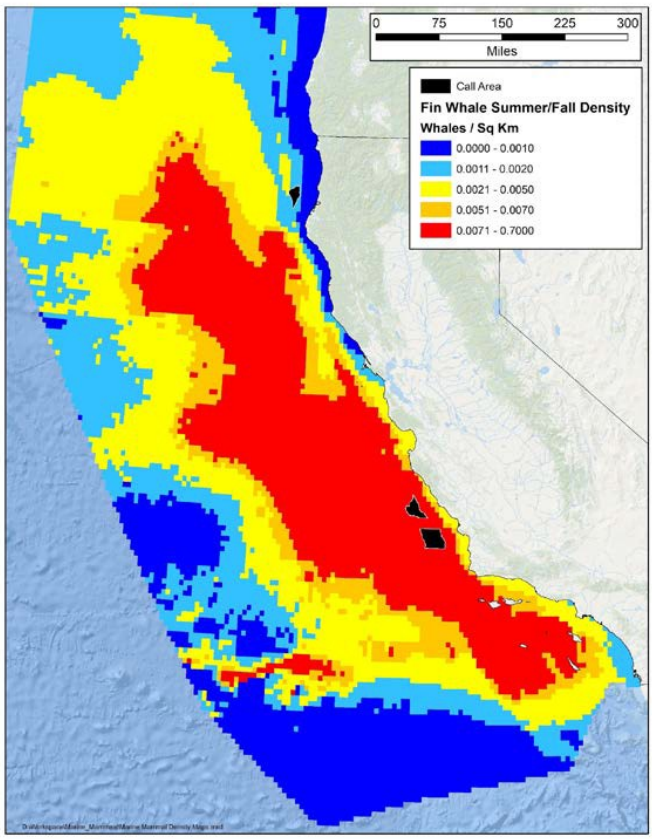

Figure 12: *Predictive habitat-based models of fin whale density for summer/fall (Becker et al., 2016).*

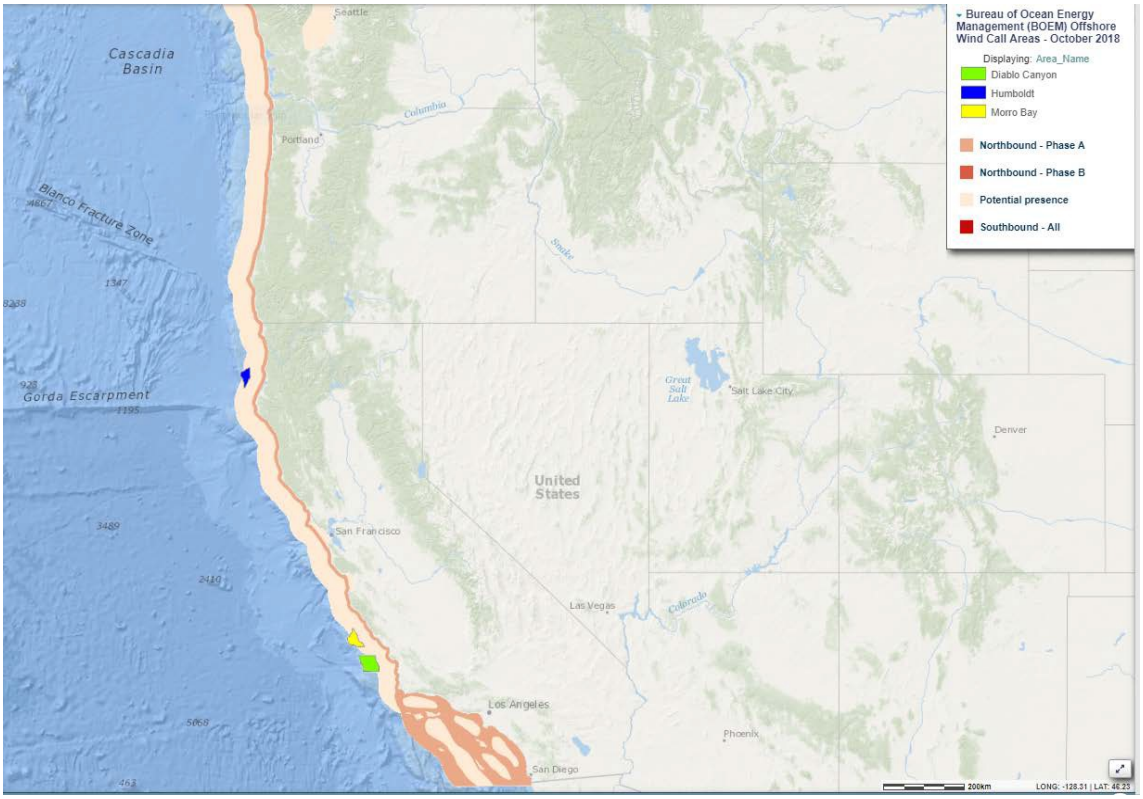

Figure 13*: Gray whale migratory corridor including the 25.4 nmi buffer that overlaps with the Humboldt Call Area, showing North and Southbound routes (Phases A and B overlap and therefore only show one color = Northbound Phase A).*

f) Leatherback Sea Turtles: Leatherback sea turtles have the most extensive range of any living reptile and have been reported circumglobally throughout the oceans of the world (Marquez, 1990; NMFS and USFWS, 1998). Migratory routes of leatherbacks are not entirely known. However, turtles tagged after nesting in July at Jamursba-Medi, Indonesia, arrived in waters off California and Oregon during July-August (Benson et al., 2007a; 2011) coincident with the development of seasonal aggregations of jellyfish (Shenker, 1984; Suchman and Brodeur, 2005; Graham, 2009). Other studies similarly have documented leatherback sightings along the Pacific coast of North America during the summer and fall months, when large aggregations of jellyfish form (Bowlby, 1994; Starbird et al., 1993; Benson et al., 2007b; Graham, 2009). NMFS published a final rule designating critical habitat for leatherback sea turtles in 2012. This critical habitat contains the main feeding habitat for leatherback sea turtles and stretches along the California coast from Point Arena to Point Arguello east of the 3,000-meter depth contour; and 25,004 square miles (64,760 km^2) stretching from Cape Flattery, Washington to Cape Blanco, Oregon east of the 2,000 meter depth contour. The Humboldt Call Area does not fall within feeding critical habitat for leatherback sea turtles designated under the ESA (Figure 14).

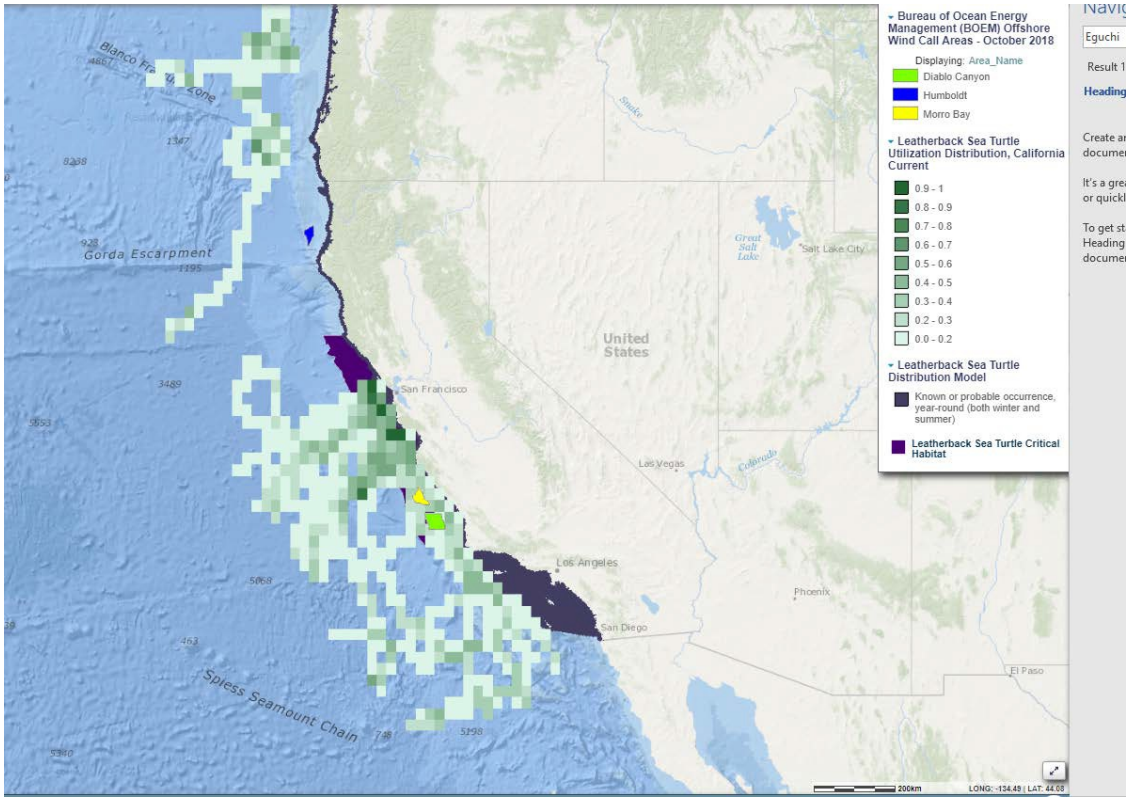

Figure 14: *Leatherback sea turtle critical habitat (Maxwell et al., 2013) overlaid with projected habitat use and the Call Areas within the California Current.*

4. Maritime Navigation

Vessel traffic patterns of concern to the Humboldt Call Area include vessels entering or exiting Humboldt Bay, vessels transiting the Humboldt Call Area when traveling between ports to the north and south, and tug and tow vessels traveling in traffic lanes near the Humboldt Call Area.[27] Using AIS on-board tracking data, Figure 15 shows vessel traffic for all ships in 2017 and Figure 16 shows vessel traffic for specific vessel types. Commercial vessels 65 feet or greater in length are required to carry AIS transponders. Due to the concentration of tug and tow vessels in nearshore lanes and presence of cargo ships primarily further offshore, vessel traffic is not considered a basis for eliminating any portion of the Humboldt Call Area from consideration for potential leasing. Site-specific navigational impacts would be assessed at the COP stage through the lessee's submittal of a Navigation Safety Risk Assessment and the implementation of appropriate mitigation measures.

[27] A "traffic lane" is an encompassing term, including Traffic Separation Schemes (TSSs), fairways, and other formally designated routing measures.

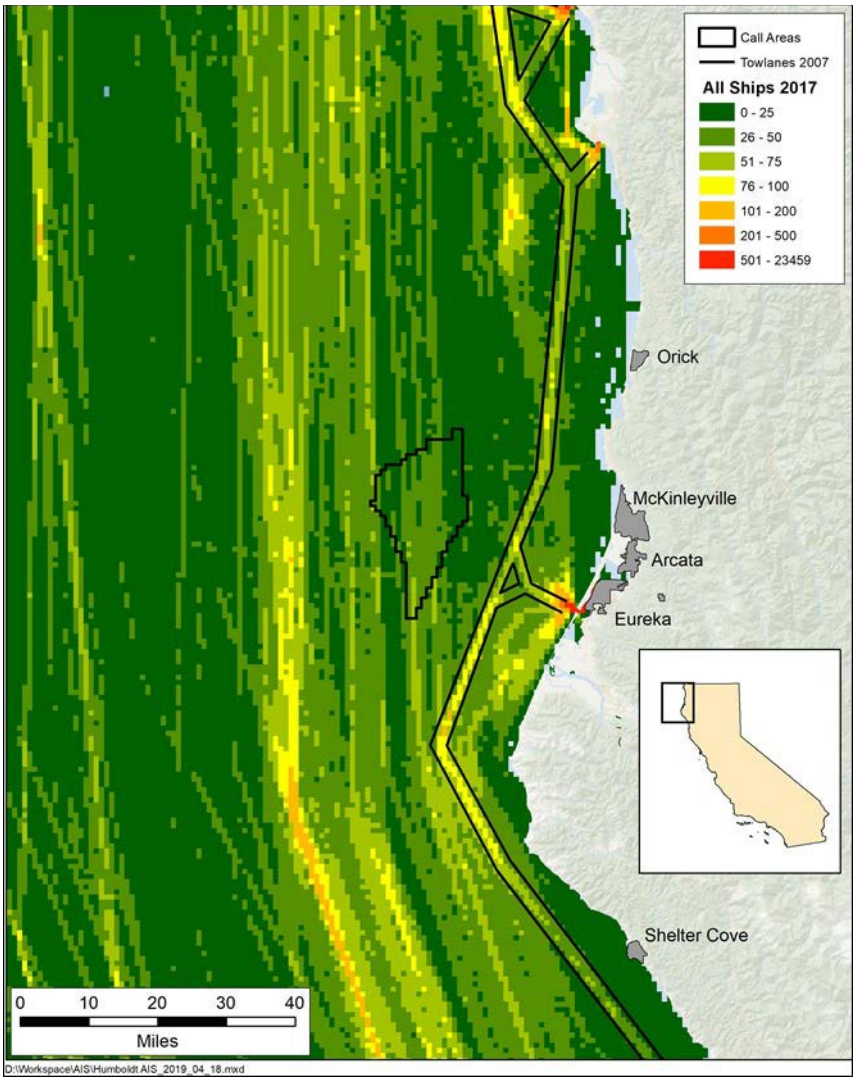

Figure 15: *All Ship Traffic Legend shows number of vessels passing through the Humboldt Call Area in 2017.*

Based on 2017 data, traffic patterns are more heavily concentrated further out to sea and closer to shore than in the Humboldt Call Area. BOEM has shared these findings with and sought feedback from the USCG, area operators, and harbor safety committees.

Although tug and tow vessels historically stay near the shore, comments from stakeholders, including the American Waterways Operators, indicated they are starting to travel farther offshore. While tug and tow vessels do traverse the Humboldt Call Area, use is presently concentrated in the tow lane and further offshore. Cargo ships traverse the Humboldt Call Area, but use is concentrated further offshore. Tankers did not traverse the Humboldt Call Area in 2017.

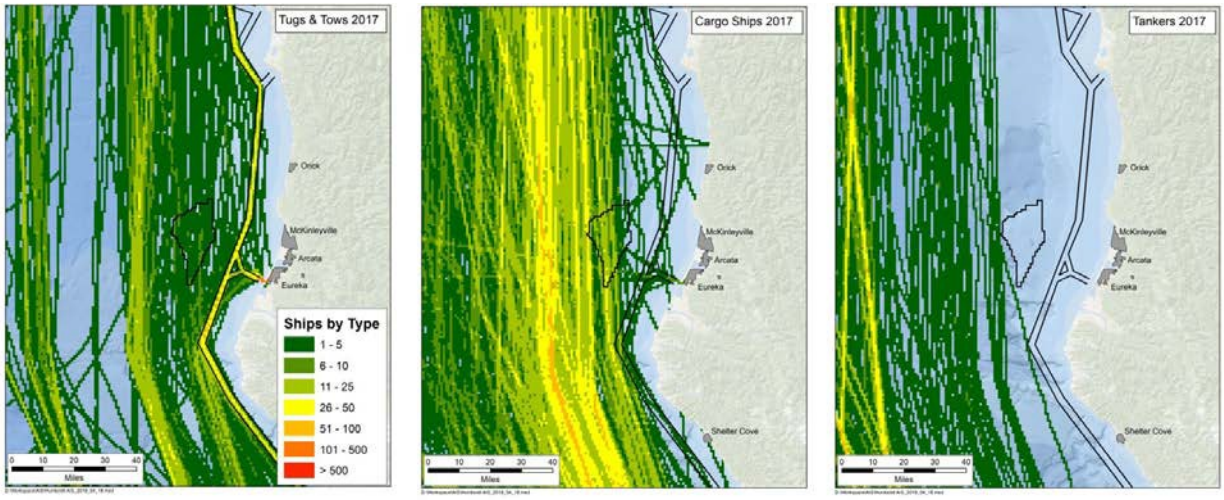

Figure 16: *Vessel traffic by Ship type in 2017. Legend shows number of vessels by type passing through Humboldt Call Area in 2017.*

5. Historic Properties

Some National Historic Landmarks and historic properties may have historically important viewsheds that could potentially be adversely affected by offshore wind energy developments within the Humboldt Call Area. A National Park Service unit and numerous properties listed on the National Register of Historic Properties (National Register) are located along the coastline near the Humboldt Call Area. These include, but are not limited to: Redwood National and State Parks; Tolowot, Gunther Island Site 67; Humboldt Lagoons; Dry Lagoon; Patrick's Point and Del Norte Coast Redwoods State Parks; Trinidad Head Lighthouse; and Punta Gorda Lighthouse. Also located near the Call Area are several state historic landmarks and sites listed on the California Register of Historical Resources. A more complete source of National Register-listed properties, along with properties that have been determined eligible for the National Register but not listed, may be found through the California Historical Resources Information System (CHRIS).

The number of affected properties and the extent of impacts depends on project siting and the lighting and marking of any structures. BOEM lists lighting and marking measures in its guidelines, available on the BOEM website.[28] Under BOEM's phased process for renewable energy development, Section 106 consultation under the National Historic Preservation Act and NEPA review of projects do not occur until BOEM considers a submitted COP. Generally, there is less impact to onshore historic properties (and the impacts are more readily mitigated) the farther from shore the wind facility construction occurs. It is therefore premature to exclude areas at the Area ID stage based on potential impacts to historic properties.

6. Visual Impacts

During outreach meetings and in comments received in response to the Call, stakeholders raised concerns that visual impacts from turbines sited within view of onshore properties are of concern to the public. Visual impacts depend on project specifics, such as wind turbine number, size,

[28] https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lighting-and-Marking-Guidelines.pdf

spacing, and configuration, and, as such, it is more appropriate to conduct visual simulations when those details are known. However, in an effort to provide information to address these concerns, BOEM funded visual simulations (see https://www.boem.gov/California-Visual-Simulation/) that use a theoretical project configuration in the Humboldt Call Area viewed from Patrick's Point State Park. As noted above, potential visual impacts are reduced the farther development is from shore. Potential visual impacts and potential mitigation measures, such as paint colors and aircraft detection lighting systems, would be fully analyzed in coordination with the California agency partners if a lease(s) is issued and a COP(s) is submitted. It is therefore premature to exclude areas at the Area ID stage based on potential visual impacts.

7. Military Activities

Development of offshore wind in the Humboldt Call Area does not directly conflict with current Department of Defense (DOD) missions in this region but may require the development of site-specific stipulations at the COP stage. The Humboldt Call Area is categorized by DOD as "yellow," meaning site specific stipulations may be required in consultation with DOD due to potential conflict with North American Aerospace Defense Command (NORAD) (see Figure 17 below).

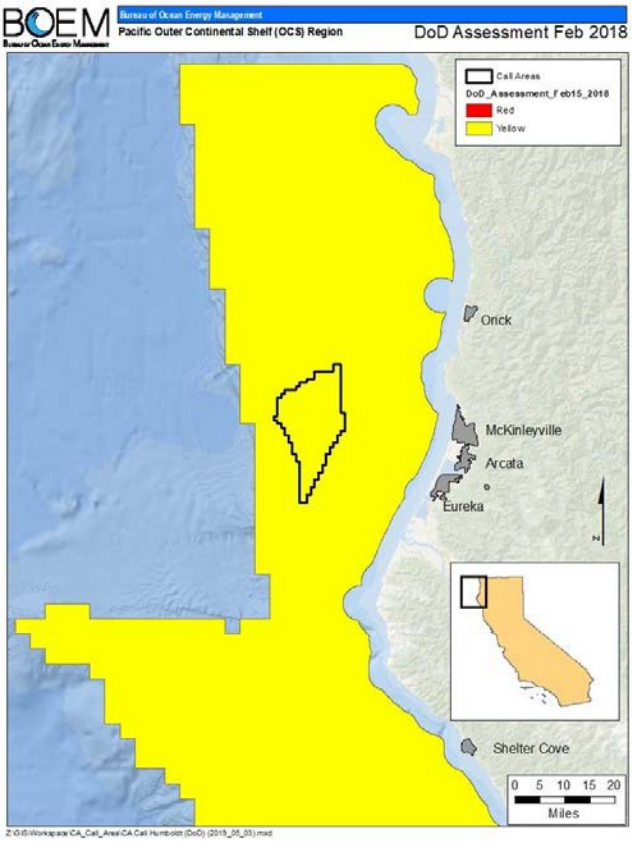

Figure 17: *DOD Mission Compatibility Assessment for Northern California. Humboldt Call Area outlined in black.*

B. Commercial Viability and Related Considerations

The North Coast's offshore wind energy generation potential makes it a potentially ideal location for developing offshore wind energy technologies. BOEM received multiple nominations of interest on the Humboldt Call Area. Ten of the fourteen companies who responded to the Call submitted nominations of interest on the Humboldt Call Area.

The Port of Humboldt Bay is a deep-water port with facilities and infrastructure that could be adapted to support offshore wind energy development. The Port issued a Request for Proposal (RFP) *(http://humboldtbay.org/*) for the development, use, and occupancy of Redwood Marine Terminal I. The RFP states that the long-term goal for the terminal is to repurpose the area into a Multipurpose Marine Terminal to support proposed offshore wind energy development in the region.

The lease request from RCEA is within the Humboldt Call Area. In its lease request, RCEA indicated that it has worked with its project partners and members of the community to explore and develop the offshore wind potential of Humboldt County. We find it significant that RCEA requested an area within what BOEM and the state ultimately identified as the Humboldt Call Area, given RCEA's familiarity with the community resources, values, and conditions in, around, and offshore of Humboldt County. In its submittal to BOEM, RCEA indicated that it and its partners have done extensive community outreach – informing the public and commercial interests, gathering feedback, and listening to and incorporating the concerns and desires of the entire region – to inform its lease request.

The Humboldt Call Area represents portions of the OCS that BOEM has identified in consultation with several parties, including state agency partners and the Task Force. The comments received during the Call do not support reducing the area that would go through a NEPA review. At this stage, it also appears that the Call Area is large enough to support two or more commercially viable offshore wind projects based on the average capacity of recent fixed-foundation and floating offshore wind projects in Europe.[29] This could generate more competition in a lease sale and subsequent development, which could by extension result in project efficiencies and other consumer benefits. Large enough areas are also required to allow for consideration of wake modelling and cable connection schemes, and to accommodate variable sea floor conditions to optimize wind farm layouts.

Finally, BOEM must consider prevention of waste in making its leasing decisions.[30] This obligation may include consideration of the optimization of the generation of wind energy. In the absence of compelling reasons to eliminate portions of the Call Area from consideration as a WEA, BOEM has determined that designating the entire Call Area as a WEA satisfies its duty at this stage to prevent waste of the wind energy resource.

[29] https://www.thewindpower.net/index.php
[30] *See* 43 U.S.C. § 1337(p)(4)(C).

VII. WEA Recommendation

To facilitate the Area ID planning process, BOEM prefers to maintain flexibility by identifying more (and in some cases, larger) WEAs. In recommending the following WEA, BOEM also aims to be responsive to the region's renewable energy goals, increase the potential for competition in future offshore wind energy solicitations, and develop a predictable leasing avenue.

For the reasons set forth above, BOEM recommends moving forward with a Humboldt Wind Energy Area consisting of the Humboldt Call Area in its entirety. None of the analyzed factors above weighs in favor of reducing the size of the Call Area at this time, and commercial factors weigh in favor of considering the whole area for environmental review for potential leasing.

Director Concurrence

The BOEM Pacific OCS Regional Office has completed the Area Identification process to delineate the Humboldt WEA as most suitable for environmental review for potential wind energy leasing.

☑ Yes

☐ No

AMANDA LEFTON

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Amanda Lefton
Director, Bureau of Ocean Energy Management

Date