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## Monterey Bay Aquarium comments CA offshore wind draft strategic plan

Please see the attached comments from the Monterey Bay Aquarium

*Additional submitted attachment is included below.*

Monterey Bay Aquarium

April 22, 2024

California Energy Commission
715 P Street
Sacramento, CA 95814
*Submitted via online portal*

**Docket 17-MISC-01: California Offshore Renewable Energy. AB 525 Draft Strategic Plan for Offshore Wind Development**

Monterey Bay Aquarium (Aquarium) appreciates the opportunity to provide comments on the draft Strategic Plan for Offshore Wind Development (draft plan) in California, developed as required by Assembly Bill 525. We commend the work of the California Energy Commission (CEC) and its partner state agencies in constructing this comprehensive plan to guide the development of offshore wind energy to meet the state's ambitious renewable energy and decarbonization goals.

The Aquarium's mission is to inspire conservation of the ocean, starting with the incredible wildlife and ecosystems along the California coast. We raise awareness and encourage action for ocean health with millions of visitors, students, and online audience members each year. We work to improve ocean health by conducting scientific research, informing policy from the local to global level, and promoting market-based change, all with a large network of public and non-government partners. We also work with our science and technology partner, the Monterey Bay Aquarium Research Institute (MBARI), to apply cutting-edge technology and tools to support ocean conservation goals.

The science is clear: climate change and biodiversity loss are two of the biggest threats to the health of our ocean and our planet. For several decades, the Aquarium has championed action to combat climate change, while restoring and protecting the ocean and coast and the myriad services, including climate mitigation, they provide to our state and communities. There is a lot at stake as the California Current Ecosystem (CCE) is one of the most unique and productive bioregions on the planet. We believe that California can and must transition to a renewable energy future in a way that prioritizes the prevention and mitigation of impacts of development on the CCE, other ocean uses, and California communities.

As the CEC finalizes the Strategic Plan and offshore wind energy in California progresses, we urge the agency to ensure that the development of offshore wind farms and supporting infrastructure is done responsibly and with the protection of biodiversity, cultural resources, public health, and other ocean uses. To achieve these objectives and ensure responsible offshore wind energy generation, planning and development off California must:

(1) avoid, minimize, mitigate, and monitor for adverse impacts on wildlife and habitats;
(2) minimize negative impacts on other ocean uses;
(3) include robust consultation with Native American Tribes and communities;
(4) meaningfully engage state and local governments and stakeholders from the outset;
(5) include comprehensive efforts to avoid negative impacts to underserved communities; and
(6) use the best available scientific and technological data to ensure science-based and stakeholder-informed decision making.

We are encouraged by the language in AB 525 and in the draft plan on the importance of California's marine ecosystem and the state's biodiversity goals. For example, AB 525 directs the state to ensure the development of offshore wind is done "in a manner that protects coastal and marine ecosystems" and to use its authority to "ensure (1) avoidance, minimization, and mitigation of significant adverse impacts, and (2) monitoring and adaptive management for offshore wind projects and their associated infrastructure."[1] The draft plan states that "*[s]uccessful* development of floating offshore wind and associated infrastructure to support offshore wind development *depends on avoiding and minimizing impacts*" [emphasis added].[2]

We also appreciate that the CEC and its partner agencies have recognized the importance of comprehensive monitoring and adaptive management in the draft plan, particularly given the uncertainty about the impacts of floating offshore wind. We are pleased to see the inclusion of recommendations from environmental nongovernment organizations as a "good starting point for discussions"[3] on monitoring and adaptive management plans. We agree that the state and its partners must undertake robust scientific research to identify and address data gaps to better understand the potential impacts of offshore wind and associated infrastructure. This information is critical for both current and future projects in order to avoid, minimize, and mitigate impacts, as well as for informing adaptive management through all phases of development.

For these reasons and to ensure effective consideration of the marine ecosystem, the Aquarium believes the final plan should include a thorough review of the potential effects and the research needed to identify and address data gaps. It should include detailed consideration of potential cumulative marine impacts, including nearshore and coastal impacts, at prospective scales of development; clearly define mitigation and adaptive management strategies; and support comprehensive, ongoing monitoring through the lifetime of offshore wind projects, including decommissioning.

The Bureau of Ocean Energy Management is currently reviewing cumulative impacts and potential monitoring and mitigation measures in its Programmatic Environmental Impact Statement for the five current California lease areas. We expect this information and analysis to be included in the final plan.

[1] Offshore Wind Generation, Assembly, AB 525, Chapter 231, Statutes of 2021, Section 1(m).
[2] Draft Report at page 7
[3] Draft report at page 61

Our recommendations below focus on strengthening the information on impacts, science needs, and mitigation included in Chapters 4 and 5 of the draft plan. The final plan should also include a timeline for regular updates as new information becomes available.

## 1. Impacts

We appreciate that the draft plan recognizes that there is significant uncertainty about the impacts of floating offshore wind, given its limited worldwide deployment and the differences between the CCE and the marine environments where floating offshore wind operates today. We agree that some potential impacts can be identified based on the best available information; however, the CEC should anticipate that unexpected impacts may also occur. To adequately identify and address impacts, the final plan should call for several years of research and monitoring prior to the start of development and throughout the lifetime of projects. For example, ongoing monitoring, including baseline data collection, is necessary to understand current oceanographic variations like marine heatwaves, as well as changing patterns in current ocean uses which may influence the ecosystem effects of offshore wind energy projects.

The final plan should include changes to hydrodynamic and aerodynamic processes in the list of potential impacts at the beginning of Chapter 4. Modeling studies have identified some potential impacts on upwelling from the installation of wind turbines in the five current lease areas.[4] However, it is unknown how these changes will impact nutrient transfer and prey availability for higher trophic-level predators. Modeling that also incorporates biological elements is needed to understand the possible effects on food web dynamics from potential changes to upwelling. Even small changes to upwelling may have cascading impacts on higher-trophic level predators. For example, blue whales respond to short-duration aggregations of forage species in wind-driven upwelling plumes, and large whales may not forage or may switch foraging techniques if prey patches are below a specific density or lack key characteristics.[5] Ongoing monitoring under a range of ocean conditions will be necessary to assess the scale of these impacts and we urge the state to continue its support and investment in research on the impacts of offshore wind development on upwelling in the CCE.

We recommend that “offshore” and “nearshore” impacts be considered as separate categories because of the unique habitats and species assemblages in offshore and nearshore areas, as well as the different development-associated activities that will occur in these areas. This warrants separate review and strategies to avoid, minimize, and mitigate impacts.

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[4] Raghukumar, K. et al. (2024). A Numerical Modeling Framework to Evaluate Effects of Offshore Wind Farms on California’s Coastal Upwelling Ecosystem (Report No. CEC-500-2024-006). Report by Integral Consulting Inc. Report for California Energy Commission.

[5] Feyrer, L.J., Duffus, D.A. (2015). Threshold foraging by gray whales in response to fine scale variations in mysid density. *Marine Mammal Science, 31*(2), pp. 560-578. https://doi.org/10.1111/mms.12178; Goldbogen, J.A. et al. (2015). Prey density and distribution drive the three-dimensional foraging strategies of the largest filter feeder. *Functional Ecology, 29* (7). pp. 951-961. https://doi.org/10.1111/1365-2435.12395

The overview and analysis of impacts in Chapter 4 should recognize that the scale and effect of impacts on species may differ due to individual species' endangered status or exposure to existing stressors throughout the CCE and in the vicinity of wind farms.[6] Similarly, the final plan should consider the cumulative effects of construction and operation of offshore wind facilities with existing activities in development areas that may compound impacts to vulnerable species and habitats.

The final plan should include impacts from site assessment, such as cumulative noise from multiple surveys that may be operating concurrently, increased vessel traffic, and deployment of metbuoys. Primary entanglement risk on inter-array cables, which are smaller in size than mooring lines and may present a greater entanglement risk, should be noted and strategies to address this risk should be included in the recommendations, such as design requirements that would minimize slack lines and promote visual and acoustic inspection of infrastructure to detect potential entanglements.

Underwater noise should also include anchor installation methods: while offshore construction activities for floating offshore wind will not involve pile driving, there is little information available on the noise produced by installing anchors. Impacts should note additional detail on the potential of temporary or permanent displacement of individuals of all species from important habitats such as foraging areas. Even temporary displacement or interruption of foraging behavior can result in energetic costs for individuals.[7] Proximity of offshore wind energy activities to known important habitat areas (e.g. cetacean Biologically Important Areas and seabird Important Bird Areas)[8] should be considered in identifying mitigation strategies to address displacement. Techniques such as real-time acoustic monitoring for animal presence and noise levels, and other technology that supplements, but does not replace, real-time Protected Species Observers should be included in mitigation strategies for the impacts of underwater noise.

Pinnipeds and sea otters are at risk of vessel strikes and disturbance, especially in nearshore areas. We support the inclusion of a 10-knot speed limit to reduce vessel strike risk for large whales and recommend additional speed limits and distance requirements be considered to address risks to pinnipeds, sea otters, sea turtles, and coastal cetaceans including harbor porpoises.

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[6] Southall, B.; Mazurek, R.; Eriksen, R. (2023). Vulnerability Index to Scale Effects of Offshore Renewable Energy on Marine Mammals and Sea Turtles Off the U.S. West Coast (VIMMS) (Report No. OCS Study BOEM 2023-057). Report by Southall Environmental Associates Inc (SEA). Report for Bureau of Ocean Energy Management (BOEM).

[7] Enrico P. et al. (2021). Context-dependent variability in the predicted daily energetic costs of disturbance for blue whales. *Conservation Physiology, 9* (1), https://doi.org/10.1093/conphys/coaa137

[8] Calambokidis J. et al. (2024). Biologically Important Areas II for cetaceans within U.S. and adjacent waters - West Coast Region. *Front. Mar. Sci.,11*:1283231. https://doi.org/10.3389/fmars.2024.1283231; National Audubon Society Important Bird Areas, https://www.audubon.org/important-bird-areas

We appreciate that potential changes to upwelling are included as a specific category in the draft plan given the significance of upwelling to the CCE. Continued monitoring and research are essential to understand the impacts on upwelling and other ecosystem-wide processes, and we encourage additional modeling of potential mitigation measures, such as modifications to wind farm layout and turbine sizes. We urge the state to continue to fund, support, and use the best-available science to better understand these impacts to as fine a spatial scale as possible. In particular, the state should prioritize research that helps to identify acceptable size limits and thresholds for wind farm footprints and turbine arrays and densities to mitigate negative impacts on upwelling.

We recommend that information from ongoing studies on the effects of electromagnetic fields on CCE species is included in the section on EMF impacts.[9]

Port and Harbor impacts should include additional details on nearshore species that may be affected by port development and related mitigation strategies, particularly species protected under state and federal law such as southern sea otters. Increased vessel activity transiting through port areas may increase stress levels or disrupt foraging and other essential behaviors, as well as pose a risk of vessel strikes.[10]

**2. Monitoring and Mitigation**

The inclusion of the California Coastal Commission Consistency Determination reviews, potential mitigation strategies, and the data and information needs identified by the CCC in the draft plan provides a good initial overview of what will be needed for monitoring and mitigation. In addition, we recommend including a process and timeline for incorporating the Monitoring Guidance currently in development by the Ocean Protection Council (OPC), as well as the information described in "Monitoring of Marine Life During Offshore Wind Energy Development - Guidelines and Recommendations",[11] the report by environmental non-governmental organizations that provides a detailed guide to the science-based principles and priorities crucial to responsible offshore wind. This report includes general monitoring needs applicable to all offshore wind projects in addition to regionally focused sections including California.

We agree with the CEC that continuous, comprehensive environmental research and monitoring is needed now and throughout the full lifetime of offshore wind projects. Information gathered through prioritized comprehensive research and monitoring must be available to inform the planning of existing and future operations and meet expectations for adaptive management. A West Coast Offshore Wind Ecosystem Science Entity can help meet these needs. We

[9] See "Electrosensory systems and renewable energy", Oregon State University Big Fish Lab. https://marineresearch.oregonstate.edu/chapple-lab/research

[10] Barrett, H.E. "The Energetic Cost of Anthropogenic Disturbance on the Southern Sea Otter (*Enhydra lutris nereis*)." 2019. Master's Theses. 5023. DOI: https://doi.org/10.31979/etd.62cf-qybg

[11] Kershaw, F. et al. (2023). Monitoring of Marine Life During Offshore Wind Energy Development—Guidelines and Recommendations. https://www.nrdc.org/sites/default/files/ow_marine-life_monitoring_guidelines.pdf

recommend the final plan include information on how a Science Entity can support robust research and monitoring, incorporate scientific advice from multiple sectors, review existing and ongoing projects related to the ecosystem effects of offshore wind, and identify the best available monitoring technology. The development of a Science Entity is referred to in the Data Gaps and Research Needs section of Chapter 5, and should also be included as a recommendation for monitoring and science in Chapter 4 to address potential impacts. (More information on the purpose and role of the Science Entity is included in section 4 below).

We encourage language to "require", rather than to "promote" coordination among lessees on monitoring activities, as well as plans to minimize the impacts of concurrent activities by the lessees, such as site surveys and construction. Lessees should consider the cumulative impacts of their activities, and coordinate measures, such as staggered schedules, to reduce the effects of site surveys and construction happening in adjacent areas.

The CEC recommends developing a comprehensive mitigation framework that prioritizes avoidance and identifies additional strategies to address impacts. We encourage the CEC to include guidance on coordination of relevant state agencies for developing this framework. The final plan should clearly identify a full suite of mitigation strategies for all phases of development, including for pre-construction and pre-operation site survey activities and for decommissioning. Mitigation should include standards for measuring metrics and identifying triggers that would initiate specific mitigation measures to ensure meaningful protection for impacted marine life. There should be a clear pathway in each mitigation framework to connect monitoring and research data and analysis to mitigation and adaptive management, with opportunities for public review and input. Recommendations for addressing potential impacts should also include consideration of mechanisms for the state to direct funding to environmental research and monitoring, including through the power procurement process.

### 3. Sea Space Planning

We appreciate that the CEC is prioritizing least-conflict areas for planning for offshore wind development areas, and agree that further analysis will be necessary, especially in areas that do not currently have enough information to allow for an in-depth understanding of the extent of potential impacts. The availability of information in specific areas, including the extent of baseline data, known data gaps, and plans to address information needs, should be considered in the identification of potential offshore wind areas. The final plan should also describe a process for incorporating new data into sea space planning, such as the updated Biologically Important Areas (BIAs) for cetaceans and the results of the Pacific Port Access Route Study recently conducted by the U.S. Coast Guard.[12]

[12] Calambokidis J. et al. (2024). Biologically Important Areas II for cetaceans within U.S. and adjacent waters - West Coast Region. *Front. Mar. Sci.,11*:1283231. https://doi.org/10.3389/fmars.2024.1283231; U.S. Coast Guard. June 2023. Port Access Route Study: The Pacific Coast from Washington to California. 88 Fed. Reg. 36,607. Notice. Available at https://www.federalregister.gov/d/2023-11878.

Areas already shown to have high conflict in multiple categories (as listed in Table 5-1) should be excluded from further consideration. The precautionary principle should be applied in areas with "No Data available" in multiple categories; research should be conducted in these areas to address the lack of data and establish baseline conditions before advancing sea space planning.

In the ongoing analysis of least-conflict areas, particularly for areas beyond 20 miles from shore, we encourage the CEC to consider not only the presence and density of biological resources, but also the status and potential vulnerability of biological resources to development, the importance of these resources to the health of the overall CCE and biodiversity, and the proximity of other ocean uses that may increase cumulative impacts on biological resources. For example, marine mammals and seabird species that occur offshore in smaller densities than nearshore species may be more vulnerable to development activities or be protected under federal or state law. Offshore benthic areas may include biogenic habitats, such as seamounts, that are important foundational environments and provide unique resources to deep-sea marine life.[13] Close proximity of potential offshore development areas to existing ocean uses may increase cumulative impacts on vulnerable species and exacerbate stressors such as underwater noise, entanglement risk, and habitat displacement.

The CEC appears to have removed national marine sanctuaries from consideration for wind farm development, but these sanctuaries may still be impacted by associated activities including transmission cables and vessel traffic, and therefore should be included in the final plan. We recommend that the CEC note the proposed Chumash Heritage National Marine Sanctuary in Figure 5-1 and clarify the exclusion of other national marine sanctuaries.

**4. Science Entity**

We appreciate that the draft plan acknowledges the importance of establishing a West Coast Offshore Wind Ecosystem Science Entity. The purpose and benefits of comprehensive environmental research and monitoring are clear: to ensure the best available science can inform decisions on management and use of the ocean, efforts to coordinate diverse interested parties, effectively allocate resources, and support collaborative data-sharing are required. A single entity can guide these processes, support data transparency, and shape adaptive management to build a strong foundation for connecting science and offshore wind planning decisions.

The draft plan refers to an expert science entity to be established and developed by the OPC. As stated in previous letters from the Aquarium and conservation partners, we support the establishment of a West Coast Offshore Wind Ecosystem Science Entity dedicated to the identification and prioritization of existing and new ocean and coastal research needs and projects to understand the impacts of offshore wind development. A Science Entity can house

[13] Barry, J.P. et al. (2023). Abyssal hydrothermal springs—Cryptic incubators for brooding octopus. *Science Advances, 9*(34): 1–13. science.org/doi/10.1126/sciadv.adg3247; NOAA Deep Sea Coral and Sponge Map, https://www.ncei.noaa.gov/products/noaa-deep-sea-coral-and-sponge-map

and synthesize essential information about the effects of offshore wind development, align data and other relevant standards, and ensure the development and consistent use of the best available science through all phases of offshore wind development.

Forming a science entity to guide monitoring and research now will be incredibly valuable to inform the comprehensive monitoring guidance currently in development, and the critical comprehensive baseline data collection that has yet to occur. We request additional specificity on the intended vision and process for establishing this body from the OPC in the final plan, including how the science entity will guide and coordinate data, research, and monitoring; how to ensure the best available science is available to decision makers; a timeline and structure; the inclusion of Tribes and Indigenous communities in planning and implementation; and connection to mitigation and adaptive management strategies.

The Aquarium supports the swift development of this science entity and action by the state to ensure its establishment, and we stand ready to work with the state to assist in its creation.

## 5. Conclusion

The Aquarium appreciates the leadership of the CEC in developing a Strategic Plan to ensure that development of offshore wind in California is done responsibly and with the protection of the marine and coastal environment prioritized in planning and policy decisions. We look forward to continuing to work with the CEC and partner agencies to ensure that the final plan includes strong research, monitoring, and adaptive management strategies.

Thank you for your consideration of our comments. Please contact us for any questions or additional information.

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