COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON MARINE PLANNING

The Coastal Pelagic Species Advisory Subpanel (CPSAS) continues to be impressed and supports the important work that the Marine Planning Committee (MPC), the Habitat Committee, the Pacific Fishery Management Council (Council), and Council staff are doing to monitor and protect our Pacific Ocean environment, essential habitat, ecological systems, and our fisheries from large tracts of indiscriminate ocean industry development that does not recognize the presence of the fishing industry or protection of ocean ecosystems. The fishing industry and some in the environmental community have expressed their concerns to the Bureau of Ocean Energy Management (BOEM). Industry has submitted comments to BOEM and other agencies on every available occasion and has coalesced to better express these concerns to a larger audience. Much of that expressed content has been directly attributable to work the MPC and Council have undertaken. Your work is greatly appreciated.

Virtually all life in the California Current ecosystem is dependent on atmospheric wind energy.

After reviewing the briefing book materials, the CPSAS suggests that future comment letters or documents take into account new information related to the potential impacts of wind energy to CPS stocks. The CPSAS-related fisheries are entirely involved in forage fish species. We sustainably harvest CPS species when cautious regulatory safeguards are met. One of these species is Pacific Sardine when in the expansion cycle. When there are high volumes of sardines, they serve as a major food source for species like whales, salmon, and seabirds. As stated in our March CPSAS report (Agenda Item C.2.a, Supplemental CPSAS Report 1, March 2022) on MPC activities, we believe there is a potential danger that the paucity of research precludes the collection of sufficient data to determine the degree of alteration caused by wind energy generation installations to important hydrological features such as upwelling, transport, stratification, mixing, and current strength. As cited in our March report, these transport mechanisms make it possible for larval sardine to make it over 60 miles to their inshore nursery zones. This is one specific example of how wind energy could negatively impact a high importance fishery and forage fish.

Another open question is what the removal of wind energy for electrical generation would do in El Nino events? It is logical to assume that when the ocean ecological system is under the stress of an El Nino that removal of wind energy could amplify that stress, but we have found no studies to verify this.

This energy removal could have direct consequence on our fisheries and many mammalians, avian, reptilian, finfish, and shellfish species. We offer two quotes for your consideration.

> **Upwelling Jet Separation in the California Current**: *"...future changes in the intensity and seasonality of the wind stress curl field may similarly have a broad influence in the California Current System ecosystem, being particularly important to influence the three-*

*dimensionality of the circulation which ultimately controls the width of the region under the direct influence of nutrient-rich upwelled waters***."** [1]

(Re: California Current) **Effect of Floating Offshore Wind Turbines on Atmospheric Circulation in California**: *Wind-driven upwelling is responsible for much of the primary productivity that sustains one of the richest ecosystems on the planet (Xiu et al., 2018)*[2]*. Specific to California, Huang and Hall (2015) applied WRF-WFP to simulate a 10 km × 10 km wind farm offshore of Bodega Bay, California. The authors found approximately 10% reduction in wind speeds, with reductions seen 100 km downstream.*

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[1] Upwelling jet separation in the California Current System: Nature: Scientific Reports: Article #16004 (2018) Upwelling in the CA Current.pdf

[2]: "Frontiers in Energy Research" Frontiers | Effect of Floating Offshore Wind Turbines on Atmospheric Circulation in California | Energy Research (frontiersin.org)