COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON MARINE PLANNING

The Coastal Pelagic Species Advisory Subpanel (CPSAS) and the Coastal Pelagic Species Management Team (CPSMT) met in a joint session on March 1st and listened to a summary of Marine Planning issues. This included a summary of four reports under this agenda item, two from the Marine Planning Committee (C.2.a, MPC Report 1 and Supplemental Report 2) and one each from the Habitat Committee (C.2.a, Supplemental HC Report 1), and the Ecosystem Workgroup (C.2.a, Supplemental EWG Report 1).

We commend and thank the MPC, HC, and EWG advisory bodies (AB) for their thorough work to research this material and employment of their professional skills to create these policy guidance documents on a topic of increasing importance. While we endorse the reports of all three ABs, we concur with the EWG suggestion that the Council direct the MPC to become the lead AB and incorporate those constructs of merit from the EWG and HC reports into those of the MPC. It may be that other ABs have worthwhile ideas that complement the material in these reports. If so, the CPSAS recommends that the Council direct inclusion of those ideas into the final document.

In our joint meeting with the CPSMT, the CPSAS agreed and supported the CPSMT's perspectives on offshore wind (OSW).

Until now the CPSAS and MPC did not express concerns about CPS fishing locations and OSW. Much of what the EWG and HC reports cover is the unknown environmental effects of OSW. However, two articles describe new research in Europe on the effects of wind turbines on ocean hydrodynamics and meteorology. These research reports illustrate that wind turbines change currents, wind strength, salinity, and other habitat in the lee of turbines. Quotes below are from those scientific articles regarding downwind impacts of wind energy and a third on sardine recruitment dynamics.

Emergence of Large-Scale Hydrodynamic Structures Due to Atmospheric Offshore Wind Farm Wakes

"The simulations show the emergence of large-scale attenuation in the wind forcing and associated alterations in the local hydro- and thermodynamics. The wake effects lead to unanticipated spatial variability in the mean horizontal currents and to the formation of large-scale dipoles in the sea surface elevation. Induced changes in the vertical and lateral flow are sufficiently strong to influence the residual currents and entail alterations of the temperature and salinity distribution in areas of wind farm operation. Ultimately, the dipole- related processes affect the stratification development in the southern North Sea and indicate potential impact on marine ecosystem processes"[1]

[1] Frontiers | Emergence of Large-Scale Hydrodynamic Structures Due to Atmospheric Offshore Wind Farm Wakes | Marine Science (frontiersin.org)

Wind farms are altering the North Sea[2]

"*The analysis shows a connection between wake vortices and changes in the momentum-driven exchange between the atmosphere and the water. This in turn could affect the horizontal currents and stratification of the water".*

"The effects of wake vortices are strong enough to redirect the existing currents, which results in a shift in the mean temperature and salinity distribution in the areas of the wind farms".

"It is thus important to consider these consequences when developing marine protection concepts," says Hereon Institute Director Prof. Corinna Schrum. A modification in this exchange potentially affects regional atmospheric conditions and ecosystem dynamics..."

Transport Patterns of Pacific sardine Sardinops sagax eggs and larvae in the California Current System: "*Transport patterns of eggs and larvae have large effects on subsequent recruitment of pelagic fishes because eggs must be released into appropriate habitat and then retained or drift toward appropriate nursery habitat to survive. (Bakun), 1996"*[3]

This research suggest that OSW could impact successful recruitment and healthy population levels of both sardines, anchovies, and possibly other larval fish and varieties of plankton. Sardine and anchovies are the mainstays of West Coast forage fish for many species including Humpback whales, sea birds, and salmon. The research in Europe is the first major study we have seen that delineates some of the hydrological and meteorological changes that occur.

Sardines move offshore up to 60+ miles to spawn, and the larvae use ocean currents and wind to aid their journey to their nursery zones inshore. We could not find delineated data on anchovy spawning, but anchovy adults also move offshore, and inshore and young anchovy move inshore to favorable nursery zones. Temperature, salinity, upwelling nutrients, food, and other environmental drivers all influence the locations for sardines and anchovies. This results in movement between inshore and offshore waters. It now appears there may be a concern that applies to these primary forage fish stocks that might impact CPS and many other fisheries, as well as a large array of aquatic and avian animals, some of which are endangered or protected species.

For this reason and reasons outlined by the MPC, EWG, and HC, the CPSAS strongly **recommends** that the Bureau of Ocean Energy Management (BOEM) and the OSW developers should develop a programmatic Environmental Impact Statement (EIS) process prior to leasing. This EIS needs to thoroughly account for cumulative impacts. We now have a solid study on effects of wind turbines on the hydrological dynamics of the ocean. But this is only the first step

[2] https://notrickszone.com/2022/02/26/messing-with-the-environment-to-fight-climate-change-wind-farms-are-altering-the-north-sea/

[3] Transport patterns of Pacific sardine Sardinops sagax eggs and larvae in the California Current System - ScienceDirect

that needs to be taken. Delaying a robust programmatic and independent EIS until there is a pre-commissioned project ready to start construction allows a high probability for inadequate review. By that point, there could be billions of dollars invested. Many ecological harms could occur due to lack of comprehensive knowledge of ecosystem and environmental impacts. EISs are required to address cumulative impacts, and are weakened if they do not adequately analyze cumulative impacts. It is implicit that this should utilize the total number of farms and turbines along with their location. Anything less is supposition and a recipe for environmental meltdown.

For these reasons we believe that any policy guidance (for example, the draft policy in Agenda Item C.2.a, MPC Report 2) include an explicit recommendation that a full Programmatic EIS should be completed prior to leasing any wind energy area sites. Additionally, that this EIS should analyze total cumulative impacts, as these impacts will vary greatly by the number of wind farms and their proximity.

PFMC
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