

## ECOSYSTEM WORKGROUP REPORT ON THE CALIFORNIA CURRENT ECOSYSTEM STATUS REPORT

Dr. Chris Harvey of the Northwest Fisheries Science Center (NWFSC) and Dr. Andrew Leising of the Southwest Fisheries Science Center (SWFSC) presented the California Current Ecosystem Status Report (the ESR) in a public webinar on March 1, 2023. The Ecosystem Workgroup (EWG) discussed the presentation and associated report during its March 6, 2023, meeting. We thank Drs. Harvey and Leising, the Integrated Ecosystem Assessment (IEA) team, and the other contributors for their efforts to provide another comprehensive and informative report.

The EWG strongly supports the new format of the ESR and hopes that this makes the process simpler for the IEA team in the long-term. The EWG endorses the recommendations of the Scientific and Statistical Committee's Ecosystem Subcommittee (SSC-ES) in their report at Agenda Item H.1.a., particularly their guidance on modifying Appendix E to the ESR and their guidance on salmon indicators. We also support the IEA team's proposal to forgo the SSC topic review in September. By doing so, the EWG hopes to leave open space and capacity for the IEA team and Council advisory bodies (ABs) to consider and engage on Ecosystem Initiative 4. Looking forward, the EWG suggests that annual review of ESR content by the SSC-ES remains an open opportunity, but is not mandatory.

Overall, the EWG feels that the 2022 ESR was excellent as it provided myriad physical and biological ecosystem information in a succinct and easy to understand manner with a clear message about changing ecosystem conditions. We provide a number of comments for consideration in future versions of the ESR. Our comments follow the order of topics in the ESR.

The relationship of the basin scale indices (e.g. Oceanic Niño Index [ONI], Pacific Decadal Oscillation [PDO], North Pacific Gyre Oscillation [NPGO]) to local environmental conditions in the ecosystem has become less clear over the past decade. The ESR helps us understand how basin-scale processes may be changing over time. For example, there are certain expectations that come with the system being in a La Niña state (e.g., high upwelling, cool water near shore, greater productivity) that have not transpired in recent years. When basin- and local-scale indices are incongruent, the local scale indices may provide greater insight into potential, region-specific impacts. Analyses and interpretations that speak to congruence between basin- and local-scale indices, as well as the decoupling of these indices with ecological observations, could provide useful additions to Appendix E (Developing Indicators of Climate Change) of the ESR.

Thematically, including the monthly ecosystem evolution as presented in the ESR virtual meeting and presentations to Council advisory bodies helps to both highlight changing phenology in the California Current and also helps to highlight data gaps useful for better understanding of ecosystem conditions. This aligns well with understanding of biological changes in the ecosystem and changes to social and economic dynamics (e.g., as pointed out with the introduction of the new temporal fisheries diversification indicator in Appendix S: Fishery Diversification Indicators). The EWG also recognizes this may not be necessary for the annual document in the future, but having it in either the presentation, on the CCIEA website, or in the ESR can be useful.

An important section of the ESR focuses on salmon indicators, and the EWG appreciates the updates to this section. The EWG suggests providing better interpretation regarding the relationship between common murre diet and salmon returns in the main body of the report.

One of the most enticing aspects of the ESR is the section on juvenile groundfish abundance. Specifically, the rise in juvenile sablefish abundance supports a strong incoming recruitment class and aligns with reports from industry and the sea level index currently used in the stock assessment. The survey data reporting the strong incoming year class likely would not have been analyzed this year without the ESR. Regular analysis in the ESR of survey data that contains information on incoming year class strength for key fishery species could allow the council to respond to changing population productivity. This includes the West Coast Groundfish Bottom Trawl Survey for species that are well-sampled at young ages (such as sablefish), as well as the Rockfish Recruitment and Ecosystem Assessment Survey and the Northern California Current Ecosystem Survey that quantitatively sample both coastal pelagic and groundfish species.

With regard to social and economic indicators and analyses in the 2022 ESR, we appreciated the expansion of Section 4 on fisheries landings and revenue, as well as Section 5 on human wellbeing. This addressed our comments in the 2022 report on better tying in the socioeconomic sections of the report. We were particularly interested in the new index on temporal diversification in fisheries (Section 5.2) and appreciate these collaborative efforts to characterize potential interactions between fisheries and offshore wind energy (Section 4.2).

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