ECOSYSTEM ADVISORY SUBPANEL REPORT ON 2021-2022 CALIFORNIA CURRENT ECOSYSTEM STATUS REPORT

The Ecosystem Advisory Subpanel (EAS) reviewed the *2021-2022 California Current Ecosystem Status Report* (Annual Report; Agenda Item H.2.a, CCIEA Team Report 1). We continue to be impressed with the high quality of the work of the National Marine Fisheries Service's (NMFS's) Integrated Ecosystem Assessment Team (IEA Team) and congratulate the team on the milestone of their tenth Annual Report. The document is very digestible and easy to read. We appreciate their willingness to take input from the Pacific Fishery Management Council (Council) and Advisory Bodies and create new and improved analyses. We noted that several of the requests made by the EAS, such as the exploration of climate change indicators, the change to the Theil Index, and the addition of easier to interpret graphics had been incorporated in the most recent document which was appreciated. We also thank Drs. Chris Harvey and Toby Garfield for presenting their results ahead of time via webinar allowing us and other advisory bodies time to become more familiar with this report in advance of the meeting.

First and foremost, this is an impressive compendium of the state of the California Current Ecosystem across many regions from freshwater to marine, and inclusive of human communities. This assessment provides the necessary foundation for informed ecosystem-based fishery management and critical information concerning the current and future use scenarios encompassing resource conservation, marine planning, and fishery management efforts. To that end, the EAS would like to offer the following section-specific comments and suggestions for future Annual Reports for the Council's and IEA Team's consideration.

Importantly, the IEA Team has provided the information needed to move to the next stage of utilizing these data. To do so, the EAS suggests that Council consideration of future actions may benefit from improved integration of specific sections coupled with synoptic summaries. That is, considering multiple datasets and information in combination and interpreting them in the context of ecosystem-based fisheries policy or management decisions can be informative. Specifically, there may be benefits associated with "connecting the dots" between drivers and responses, particularly regarding the human dimension section and between the human dimension and biophysical sections. This is done, for example, in Appendix P (Potential for Spatial Interactions Among Ocean-Use Sectors) and Section 4.2 (Potential Interactions Between Fisheries Activity and Other Ocean Use Sectors). The EAS suggests this could be expanded based on the information now included in Section 5.4 (Fisheries Participation Networks) and Appendix S (Fishery Revenue Concentration) as well as Appendix Q (Social Vulnerability of Fishing -Dependent Communities). An example of expanded application could be projecting the consequences to fishing communities when the habitat compression index is low or high. This would improve the utility of the information provided and our understanding of how the Annual Report can link to the Council's Fishery Management Plans.

The EAS appreciated the addition of Appendix E (Developing Indicators of Long-Term Climate Change). This appendix is timely, well done, and provides the information necessary to move forward with the identification and utilization of climate change indicators. There are more linkages that could be added, especially to better understand the forage base and further the connections between drivers and responses, such as the Dynamic Factor Analysis. We look

forward to working with the IEA Team on the next steps of developing these analyses, and would welcome an opportunity to do so prior to or in conjunction with the September EAS meeting.

Regarding Appendix P (Potential for Spatial Interactions Among Ocean-Use Sectors), the EAS noted additional analyses that could help explore the challenges that wind energy siting may pose to fisheries and provide additional information on the siting of wind installations. New analyses on indicators of trawl activity in the vicinity of proposed wind energy call areas (presented in the Annual Report in Figures 4.2.1 and 4.2.2) show promise as a means to document fishing activities by one sector in the areas of concern. However, there is a need to expand this analysis to all sectors where there may be sufficient data to more effectively demonstrate historical use (e.g., recreational and non-trawl fisheries). The EAS discussed whether it might be possible to extend such analyses to include risk assessments or management strategy evaluations which consider the socio-ecological impacts resulting from fishing effort being redirected to other locations due to wind farm siting and whether efforts to develop forecasting of hypothetical future uses (in the absence of wind farms and under various climate scenarios) would also be of benefit. As a result, we suggest highlighting within the document fisheries, communities, and groups of fishery participants that are not included in these analyses so the limitations of scope may be more implicit in the interpretation, especially if used by outside agencies.

The EAS agreed that it would be useful to have more explanation of the network analyses (i.e., fishery participation and edge networks). These are important mechanisms to connect fisheries management decisions to communities and increased clarity on what conclusions can be drawn from those analyses could increase their utility in decision making.

The EAS understands there are some parts of the Annual Report that have been automated and could be provided in near-real time to allow the potential for quick response to unexpected oceanographic, climatic, and economic disruptions that can occur at any time of year. The EAS would appreciate learning more about the potential to provide automated data products in the future.

The EAS discussed the benefit of a formal opportunity to engage with the IEA Team in September as they are preparing the next Annual Report. Currently, the only opportunity is to participate in the Scientific and Statistical Committee's (SSC) annual review of revisions to the indicators included in the Annual Report, as proposed in Agenda Item H.3, Public Comment. While EAS members can observe the SSC's review in September, it is focused more on the technical details raised by the IEA Team. So rather than attend the SSC meeting, the EAS believes that engaging with the IEA Team separately to discuss revisions to indicators and how ecosystem information is packaged and presented to the Council for the following March meeting could further the EAS's understanding of the Annual Report and help ensure it is most useful for Council management. To facilitate this, the EAS would like to invite the IEA Team to meet with us either prior to or in conjunction with our September meeting.

In closing, the EAS would like to reiterate their appreciation for the IEA Team and the continuing improvements to the Annual Report. It gets better every year!

PFMC
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