



April 5, 2018

Mr. Phil Anderson, Chair
Pacific Fishery Management Council
70 NE Ambassador Place, Suite 101
Portland, OR 97220

via email: pmmc.comments@noaa.gov

Re: Agenda Item C.4. Process for Review of Reference Points or Monitored Stocks

Dear Chair Anderson and Council Members:

Wild Oceans has worked for 45 years to advance conservation-minded solutions to fisheries management that consider the impact of fishing on the ecosystem. With this in mind, we have centered our work on the protection of forage fish specifically because of their central role as prey in a healthy ocean ecosystem. We are asking the Pacific Fishery Management Council (Council) to ensure that management of central subpopulation of northern anchovy (CSNA) and other "monitored" coastal pelagic species is sufficiently protective of the stocks to maintain their ecological functions now and in the future. At this meeting, the Council is tasked with considering recommendations for developing a new Overfishing Limit (OFL) for CSNA. Given anchovy's foundational role in the California Current Ecosystem (CCE) forage assemblage, providing a main food source for recreational species¹, sea birds², and marine mammals³, we ask the Council to support the following:

¹ Koehn, L.E., T.E. Essington, K.N. Marshall, I.C. Kaplan, W.J. Sydeman, A.I. Szoboszlai, J.A. Thayer. 2016. Developing a high taxonomic resolution food web model to assess the functional role of forage fish in the California Current ecosystem. *Ecological Modeling* 335:87-100.

² Szoboszlai, A.I., J.A. Thayer, S.A. Wood, W.J. Sydeman, L.E. Koehn. 2015. Forage species in predator diets: Synthesis of data from the California Current. *Ecological Informatics* 29:45-56.

³ Ainley, D. et al. 2015. California current system – predators and the preyscape. *Journal of Marine Systems* 146:1-2.

- 1) Task the SSC to recommend a 2019 OFL, Allowable Biological Catch (ABC) and Annual Catch Limit (ACL) for CSNA using the modern abundance estimates provided by Acoustic Trawl Surveys, CalCOFI, or other best available science.
- 2) Commit to a process and timeline to develop an ecosystem-based management framework and harvest control rule for CSNA and other monitored stocks that both protects against overfishing and accounts for the needs and status of dependent predators.

CSNA provide many ecosystem services to the California Current. For example, stomach content analyses conducted by the Southwest Fisheries Science Center (SWFSC) revealed that anchovy comprised 40% of Pacific bluefin tuna prey in 2016.⁴ Further north, anchovy make up as much as 20% of the diet of west coast salmon.⁵ Low anchovy abundance may adversely affect recruitment of recreational species due to predation. Researchers found that when ocean conditions are poor, common mures in the CCE tend to forage closer to shore and prey predominantly on anchovy as well as on juvenile salmonids at a rate of up to 9%.⁶

Economically, anchovy as well as sardine and mackerel drive marine tourism through their role as prey to other valued species. Whales, seabirds and favorite recreational species, including tuna and salmon, prey on forage fish. Thriving populations of these top predators bring eco-tourists and recreational fishermen to coastal communities. In 2014, marine recreational anglers in California, Oregon and Washington contributed more than \$2.2 billion dollars in durable goods purchased to the west coast economy.⁷ Future increases in the market value of dependent predators such as salmon could make forage fish more valuable as prey than as direct catch.⁸

A robust anchovy management plan should acknowledge the foundational role of forage for marine predators, the supportive role they play as bait in recreational fisheries and commercial fisheries such as albacore, and the direct economic role they play to industrial wetfish producers. The divergent ecosystem, social, and economic contributions made by CSNA and other forage demands a twenty-first century management regime.

⁴ Agenda Item J.5.b, Supplemental SWFSC PPT, March 2017.

⁵ Koehn *et al.* 2016.

⁶ Wells, B.K., J.A. Santora, M.J. Henderson, P. Warzybok, J. Jahncke, R.W. Bradley, D.D. Huff, I.D. Schroeder, P. Nelson, J.C. Field, D.G. Ainley. In review. Caught in the middle: Top-down impacts on salmon are dependent on bottom-up mechanisms. *Journal of Animal Ecology*.

⁷ National Marine Fisheries Service, *The Economic Contribution of Marine Angler Expenditures on Durable Goods in the United States*. NOAA Technical Memorandum NMFS-F/SPO-165, September 2016.

⁸ Koehn, L.E., T.E. Essington, K.N. Marshall, W.J. Sydeman, A.I. Szoboszlai, J.A. Thayer. 2017. Trade-offs between forage fish fisheries and their predators in the California Current. *Journal of Marine Science* 74:2448-2458.

We ask you to task the SSC with developing a revised OFL for CSNA.

The central subpopulation of northern anchovy is classified as a monitored stock under the Coastal Pelagic Species Fishery Management Plan. Monitored stocks lack periodic stock assessments, however, changes to harvest specifications may be made if new scientific information becomes available to warrant changing them. Current management measures were developed using data from a stock that historically had not fallen below 299,000 mt.⁹ This regime fails when the stock falls below this level.

The Scientific and Statistical Committee (SSC) recently concluded that the best available indices indicate that the relative abundance of CSNA has remained low over the past decade, relative to the higher levels observed in the 1980s and the mid-2000s.¹⁰ Recent acoustic trawl methodology (ATM) survey data reveals a stock dramatically lower than the 299,000 mt level.¹¹ Estimates of spawning biomass derived from DEPM-based estimates from CalCOFI surveys in the Southern California Bight provide a similar picture.¹² Visually-estimated inshore anchovy biomass from aerial surveys does not makeup for the shortfall.

Considering recent evidence that the stock has contracted, the availability of new scientific information to estimate the population of CSNA, and taking into account anchovy's ecological and economic significance, especially during a time of depleted sardine abundance, it is time to revise the OFL, ABC and ACL. We continue to support development of an OFL that incorporates results from the ATM survey with an inshore correction factor as outlined by the SSC. The National Marine Fisheries Service has invested heavily in the cutting-edge ATM equipment and the data gathered will continue to provide annual information on the status of CSNA as well as the CCE coastal pelagic species assemblage. In addition, the ATM survey has been incorporated into the Pacific sardine stock assessment since 2011, and a recent Methodology Review Panel concluded the ATM survey "can be used to provide relative indices of abundance for all CPS finfish."¹³ In addition, the DEPM-based estimates from CalCOFI surveys use and apply similar methods as were used to develop previous abundance estimates used in Conrad (1991) while incorporating more robust techniques to reduce uncertainty and potential bias. The results from these two methods can be used to ground-truth biomass estimates of each.

⁹ Conrad, J.M. 1991. A bioeconomic analysis of the northern anchovy. Working paper in agricultural economics. Department of Agricultural Economics. Cornell University, Ithaca, New York, Table 2.

¹⁰ Agenda Item G.4.a, Supplemental SSC Report, November 2016.

¹¹ Agenda Item G.1.b, Supplemental SWFSC Report, April 2017.

¹² MacCall, A.D., W.J. Sydeman, P.C. Davison, and J.A. Thayer. 2016. Recent collapse of northern anchovy biomass off California. *Fisheries Research* 175:87-94.

¹³ Agenda Item C.3, Methodology Review Panel Report: Acoustic Trawl Methodology Review for Use in Coastal Pelagic Species Stock Assessments, April 2018.

In addition, we ask the Council to commit to a process and timeline to develop an ecosystem-based harvest control rule for CSNA and other monitored stocks. Earlier this week, the SSC discussed a process for review of reference points for monitored stocks. We agree that a Management Strategy Evaluation can help develop a long-term, ecosystem-based management framework for CSNA, including a harvest control rule and cutoff.

In order to have confidence in our future management strategy, we should use annual updates of abundance to actively manage anchovy. Otherwise, within a few years we will find ourselves back where we started, relying on outdated information to make critical ecological and economic decisions. As part of the longer-term strategy to develop a harvest control rule for CSNA, the northern subpopulation of northern anchovy, and jack mackerel, the Council should consider eliminating the monitored stock category under the CPS FMP. Removal of the "monitored" category is consistent with Magnuson Stevens Act, which does not include a monitored category for stocks in a fishery. "All stocks in an FMP are considered to be 'in the fishery' unless they are identified as [ecosystem component] species."¹⁴

Thank you for discussing a process and schedule for updating the anchovy OFL and harvest rules and for committing to a management framework for monitored stocks that considers the overall forage base in order to maintain adequate, diverse forage for the ecosystem. If we fail to account for predator needs, we will set forage catch limits too high, leading to ecosystem overfishing with negative impacts to predators and the entire California Current ecosystem.

Sincerely,



Theresa Labriola
Wild Oceans
Pacific Program Director

¹⁴ 50 C.F.R. § 600.310(d)(1).