

## COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON THE PACIFIC SARDINE DISTRIBUTION WORKSHOP

On November 13, 2015, the Coastal Pelagic Species Management Team (CPSMT) was briefed in joint session with the Coastal Pelagic Species Advisory Subpanel (CPSAS) on the Pacific Sardine Distribution Workshop by Dr. Andre Punt, the workshop chair. The CPSMT appreciates the chair's briefing and the participants' work in examining the current DISTRIBUTION term in the U.S. harvest control rules (HCRs) for the northern subpopulation of Pacific sardine, and in evaluating potential alternatives. Four members of the CPSMT served as principal participants in the workshop. The CPSMT reviewed the Report of the National Marine Fisheries Service/Pacific Fishery Management Council Workshop on Pacific Sardine Distribution (Agenda Item H.1.a) held August 17-19, 2015 and provides the following comments and recommendations.

The Workshop Report notes that there is general agreement that three stocks occur off the Pacific coast of North America and two of these occur off the U.S. west coast. The U.S. fishery harvests primarily sardines from the northern subpopulation but the harvest also includes sardines from the southern population. Mexico and Canada also harvest sardines from the northern subpopulation. To account for the annual average portion of the northern subpopulation that is potentially available to the U.S. fishery, the DISTRIBUTION parameter is incorporated into all three U.S. HCRs for the northern subpopulation of Pacific sardine: overfishing limit (OFL), acceptable biological catch (ABC), and harvest guideline (HG).

DISTRIBUTION was implemented as a default approach to address the transboundary nature of sardine in the absence of a common international management policy with Mexico and Canada, making possible unilateral management of the U.S. fishery consistent with Magnuson-Stevens Act (MSA). The current 87 percent value for the portion of the northern subpopulation in U.S. waters is based on aerial spotter data from 1962-1992.

The workshop participants reviewed six alternatives identified in the Terms of Reference. The CPSMT is not aware of any additional data or alternatives that could have been considered by the workshop and concurs with the workshop's findings regarding the alternatives examined. The workshop participants identified substantive limitations for each of the potential alternatives and none were considered more appropriate at this time to replace the current DISTRIBUTION term in the HCRs. Should the Council wish to proceed with work to improve the DISTRIBUTION term, the workshop report identifies a total of 15 research recommendations addressing the limitations of each of the potential alternatives examined.

The CPSMT considered the potential alternatives and research recommendations in the broader context of potential benefits, feasibility and workload implications related to sardine stock sustainability and fishery management. The CPSMT notes that much of the workload associated with the workshop recommendations would likely fall to the limited number of U.S. scientists who have obligations to conduct existing CPS surveys, analyze data, and produce CPS stock assessments.

At present, the CPSMT considers improvements in biomass estimation to be comparatively more influential than improvements in DISTRIBUTION to maintain a sustainable resource.

Consequently, we prioritize research recommendations that will provide dual benefits for improved biomass estimation and potential improvements to DISTRIBUTION. Above all other recommendations, the CPSMT considers workshop recommendation #6 to “Make the US and Mexico acoustic trawl surveys comparable, and use the resulting data to estimate Distribution” as the highest priority, but with the addition of Canada acoustic trawl surveys. Acoustic estimates of biomass, covering the entire geographic range of the northern subpopulation by comparable methods, could substantially improve our understanding of stock status and distribution.

The CPSMT notes that a number of the recommendations, such as management strategy evaluations (e.g., recommendation #10) or conducting new research in the field (e.g., tagging sardine in recommendation #12), will likely take several years to complete. While potentially beneficial, the CPSMT does not recommend allocating a significant level of staff and other resources to these efforts at this time. Other workshop recommendations represent on-going research that is expected to continue and the CPSMT does not recommend putting a higher priority on them. For example, workshop recommendation #7 to “Develop a time series of estimates of Distribution using the CalCOFI and IMECOAL data” is currently being implemented. The CPSMT supports conducting this research, but does not recommend displacing other activities to increase effort on this recommendation.

The CPSMT recommends not replacing the current DISTRIBUTION term with any of the other potential alternatives because they do not provide substantive improvements at this time. The CPSMT concurs with the workshop participants that there would be benefit in continuing discussions with Mexico and Canada toward more coordinated science and management of sardines.

The CPSMT acknowledges there are limitations in using a static value for DISTRIBUTION in the U.S. HCRs and these were recognized when the 0.87 was adopted. The amount of seasonal movement by Pacific sardine depends on environmental conditions (warm water encourages movement to the north), biomass levels (such as northern feeding migrations when biomass is high), and age composition (large old fish tend to move farther north). Sometimes all of the stock is in U.S. waters and at other times this proportion is much lower. CPS FMP Amendment 8 highlighted this as one of the disadvantages of using a single number to account for the transboundary nature of sardine: “The most serious disadvantage in prorating ABC for the stock in U.S. waters is that the portion of each stock in U.S. waters has to be estimated”.

Potential improvements to this term were discussed at the 2013 Sardine Harvest Parameters Workshop (Agenda Item I.1.b, Attachment 1, April, 2013) where initial discussions focused on the difficulties inherent in the definition of the DISTRIBUTION parameter. The Workshop noted that the range and abundance of this stock had changed markedly since DISTRIBUTION was first determined and efforts should be made to synthesize the available information to improve upon the current value. At the 2015 NMFS/PFMC Sardine Distribution Workshop, Oceana presented its additional concerns with the current DISTRIBUTION term as used in U.S. HCRs, especially regarding the risk of exceeding a coastwide overfishing level from the combined harvests of U.S., Mexico and Canada.

However, even if regulating for an “Overall” coastwide fishing mortality rate were a U.S. management goal, Figure 5 in the 2015 workshop report shows the “Actual” Coastwide

exploitation rate (F) of the northern subpopulation by U.S., Mexican and Canadian fisheries combined has not exceeded this “Overall” Coastwide exploitation rate since 1994 except during 2008-2011. During these latter years, the difference appears relatively modest, with Overall F equal to approximately 0.10 and Actual F equal to about 0.12 to 0.15. Further, as demonstrated through the analyses of harvest parameters associated with adoption of the CalCOFI temperature index, sardine harvest control rules are robust.

So, while the DISTRIBUTION term is imperfect, the CPSMT does not consider urgent action necessary to maintain sustainability of the stock or improve fishery management. To recap, the CPSMT recommends not replacing the current DISTRIBUTION term now and encourages continued discussions with Mexico and Canada toward more coordinated science and management of sardines.

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