



CALIFORNIA WETFISH PRODUCERS ASSOCIATION

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April 4, 2014

Ms. Dorothy Lowman, Chair
And Members of the Pacific Fishery Management Council
7700 NE Ambassador Place #101
Portland OR 97220-1384

RE: Agenda Item H.1 Sardine Assessment and Management Measures

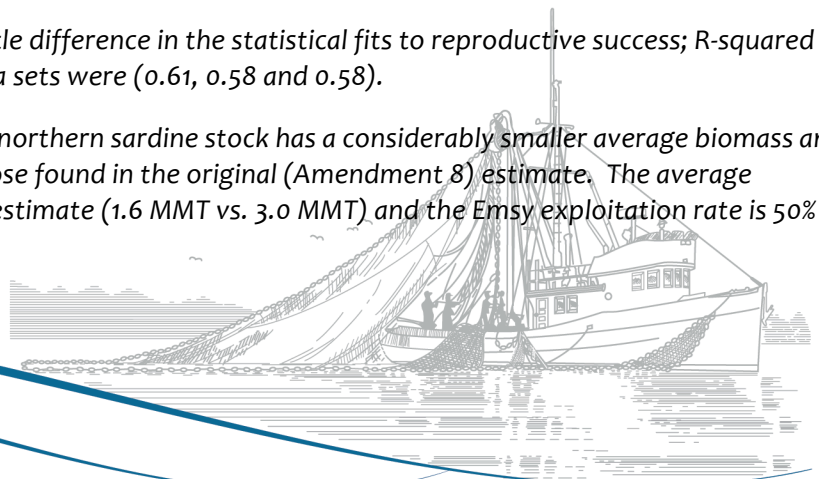
Dear Ms. Lowman and Council members,

I am Executive Director of the California Wetfish Producers Association (CWPA), representing the majority of coastal pelagic species 'wetfish' fishermen and processors in California. I appreciate your consideration of the following points in the continuing discussion regarding sardine management.

As the CPS Advisory Subpanel representative to the recent sardine STAR panel, I experienced déjà vu all over again: the Stock Synthesis model suffered the same issues with scale that were encountered in 2011. I commend the stock assessment team for their diligence and patience. I hope the Council supports the STAT suggestion to convene a workshop to address data down-weighting issues.

The business at hand is to approve management measures for the 2014-15 sardine fishery, utilizing the stock assessment approved after STAR panel review. At our request, Dr. Richard Parrish attended the STAR panel to provide his insight as one of the Amendment 8 sardine control rule architects as well as an internationally respected scientist with deep knowledge of sardine and coastal pelagic species. Dr. Parrish submitted a summary of his comments after participating in the extensive reanalysis that has occurred over the past many months. His comments are submitted independently (and appended here for reference), and I'd like to highlight a few of his observations (*italicized and in numerical order*).

3. *The highest correlation between sardine reproductive success and sea temperature was with the CalCOFI data in the 25-year analyses, the Scripps Pier data in the 36-year analyses and the ERSST data in the 62-year analyses.*
4. *With the 25-year analyses there was very little difference in the statistical fits to reproductive success; R-squared values for the CalCOFI, Scripps Pier and ERSST data sets were (0.61, 0.58 and 0.58).*
5. *The harvest control reanalysis showed that the northern sardine stock has a considerably smaller average biomass and considerably higher average productivity than those found in the original (Amendment 8) estimate. The average biomass is slightly larger than half of the original estimate (1.6 MMT vs. 3.0 MMT) and the Emsy exploitation rate is 50% higher than the original estimate (0.18 vs. 0.12).*



7. *The new analysis shows that the original harvest rule is considerably more conservative than originally thought. The average depletion level predicted with the original harvest rule analyses was 64%; with the revised analysis the original harvest rule predicts an average depletion of 78%.*

10. *The most recent stock assessment excludes the southern stock from the assessment model based on information from paper presented at the 2013 CalCOFI Conference. When this correction is included, the 2014 stock assessment shows that the northern stock's biomass and total exploitation rates over the last decade are smaller than previously thought. The total exploitation rates are smaller due to the fact that earlier stock assessments included significant landings from the southern stock.*

12. *There is likely to be considerable misunderstanding of the three Emsy values used in recent analyses and current management. The Amendment 8 estimate of average Emsy (0.12) was based on stock assessments in the early years of the fishery which included only the first few years of the rebuilding period. The revised average Emsy estimate from the sardine reanalysis (0.18), is based on the recent years of increased stock productivity. Finally, the 0.122 Emsy estimate used in the 2013 stock assessment's calculation of OFL and ABC (page 12 of the most recent assessment document) is based only on the last three years. This is the current year's Emsy estimate and it is calculated from the new three-year average CalCOFI sea temperature relationship. Note that the OFL and ABC calculations will have a different, temperature-based, estimate of Emsy for every assessment.*

13. *The harvest guideline calculation employing the Amendment 8 HCR (based on Scripps Pier SST) results in a HG of 28,646 mt; considerably lower than that with the lowest tier of the ABC Buffer calculations (i.e. 32,672 MT with $P^*=0.40$), or with the OFL calculation (i.e. 39,210 mt)*

I would also like to point out: Table 2 in the CPSMT Report (Agenda Item I.1.c, March 2014) illustrates the performance of a harvest control rule scenario where 3-year average CalCOFI is used to set the OFL, and the HG FRACTION is fixed at 15 percent (Scenario N, variant code 22). This example parallels the Council's direction for the FY 2014-15 season and shows a depletion level of 0.77, versus the base case "HG J" from Amendment 8 with depletion of 0.78.

Finally, please consider that achieving **OY requires balancing both fishery opportunity and economic stability and forage needs. The sardine harvest control rule is already the most precautionary fishery management policy in the world.**

We would appreciate the Council's recognition of this fact, as well as the continuing importance of the sardine resource to California's historic wetfish industry.

Thank you for your attention to these comments.

Best regards,



Diane Pleschner-Steele
Executive Director

Attachment: Comments on the Sardine Harvest Guideline (Quota) for 2014
Richard H Parrish, April 4, 2014
Sardine biomass variability, figure by Dr. Richard Parrish presented to the CPSMT

Comments on the Sardine Harvest Guideline (Quota) for 2014

Richard H Parrish

April 4, 2014

Submitted to the Pacific Fishery Management Council:

Over the last 15 months there has been an extremely large amount of analysis and re-analysis of the population dynamics of the northern stock of Pacific sardine. There have been four multi-day workshops/reviews and 2 stock assessments. The analyses produced from these meetings are very extensive and extremely technical. I participated in all of these meetings and have closely read all the materials produced as a result of the meetings.

What follows is an attempt to summarize what has been learned as a result of this intense research activity.

1. The large amount of recent sardine research is primarily the result of a paper that suggested that Scripps Pier sea temperature, the environmental variable in the sardine harvest control rule, was no longer a valid predictor of sardine recruitment. The re-analysis carried out at the February 2013 Harvest Parameters Workshop found that Scripps Pier temperatures were still significantly correlated with recruitment and recruitment success (i.e. recruits per spawner) in the northern sardine stock.
2. All of the three temperature time series examined had moderate levels of correlation with both sardine recruitment and recruits per spawner. With each of the three data sets, correlations were highest with the shortest (25 years) and most recent time series. They were smaller with the 36-year time series and smallest with the 62-year time series.
3. The highest correlation between sardine reproductive success and sea temperature was with the CalCOFI data in the 25-year analyses, the Scripps Pier data in the 36-year analyses and the ERSST data in the 62-year analyses.
4. The decision was made to not use the models based on annual temperatures, due to the high amount of variation in year-to-year temperatures and resultant catch quotas. Instead the 3-year average temperatures were used for management. The CalCOFI 3-year average temperature had the highest correlations in the 25-year analyses and the Scripps Pier 3-year temperature had the highest correlations in the 36-year and 62-year analyses. With the 25-year analyses there was very little difference in the statistical fits to reproductive success; R-squared values for the CalCOFI, Scripps Pier and ERSST data sets were (0.61, 0.58 and 0.58).
5. The harvest control reanalysis showed that the northern sardine stock has a considerably smaller average biomass and considerably higher average productivity than those found in the original (Amendment 8) estimate. The average biomass is slightly larger than half of the original estimate (1.6 MMT vs. 3.0 MMT) and the Emsy exploitation rate is 50% higher than the original estimate (0.18 vs. 0.12).
6. The difference between quotas produced by the original and revised analyses is quite small. The average 2000-2013 annual quota under the original harvest rule was 106,359 mt. If the new CalCOFI temperature relationship had been in effect the average annual quota would have been 103,359 mt.
7. The new analysis shows that the original harvest rule is considerably more conservative than originally thought. The average depletion level predicted with the original harvest rule analyses was 64%; with the revised analysis the original harvest rule predicts an average depletion of 78%.
8. The CPSMT decided to 'give' most of the increased production to ecosystem components rather than the fishery. If they had decided to retain the 64% depletion rate in the original analysis they would have had to significantly increase the FRACTION component of the harvest control rule.
9. The CPSMT recommendation to increase the FRACTION from a range of 5-15% to a range of 10-20% results in an average depletion rate that is 17% higher than the original harvest rule (i.e. 0.75 / 0.64)

10. The most recent stock assessment excludes the southern stock from the assessment model based on information from paper presented at the 2013 CalCOFI Conference. When this correction is included, the 2014 stock assessment shows that the northern stock's biomass and total exploitation rates over the last decade are smaller than previously thought. The total exploitation rates are smaller due to the fact that earlier stock assessments included significant landings from the southern stock.
11. With the southern stock removed from the analysis, the distribution parameter in the harvest control rule ceases to be the problem imagined by some people, as the majority of the Mexican catch was from the southern stock.
12. There is likely to be considerable misunderstanding of the three Emsy values used in recent analyses and current management. The Amendment 8 estimate of average Emsy (0.12) was based on stock assessments in the early years of the fishery which included only the first few years of the rebuilding period. The revised average Emsy estimate from the sardine reanalysis (0.18), is based on the recent years of increased stock productivity. Finally, the 0.122 Emsy estimate used in the 2013 stock assessment's calculation of OFL and ABC (page 12 of the most recent assessment document) is based only on the last three years. This is the current year's Emsy estimate and it is calculated from the new three-year average CalCOFI sea temperature relationship. Note that the OFL and ABC calculations will have a different, temperature-based, estimate of Emsy for every assessment.
13. The harvest guideline calculation employing the Amendment 8 HCR (based on Scripps Pier SST) results in a HG of 28,646 mt; considerably lower than that with the lowest tier of the ABC Buffer calculations (i.e. 32,672 MT with $P^*=0.40$), or with the OFL calculation (i.e. 39,210 mt)

Pacific Sardine Biomass Projection in 2013 (Hill 2013)

Stock biomass, used for calculating harvest specifications, is defined as the sum of the biomasses for sardine ages one and older (age 1+). Stock biomass increased rapidly throughout the 1990s, peaking at 1.36 mmt in 1999 and 1.37 mmt in 2006. Stock biomass is projected to be 378,120 mt as of January 2014:

