

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
FMP AMENDMENT 11 – SARDINE ALLOCATION

At the April 2005 Council meeting, Dr. Sam Herrick presented the Scientific and Statistical Committee (SSC) with results of his analysis of preliminary sardine allocation alternatives ([1], [2]). At that time, the SSC made recommendations for improving the analysis and indicated a need to review the sardine processor data and the associated data collection methodology. In May, Dr. Herrick provided the SSC Economics Subcommittee with documentation on the processor methodology and data. The Subcommittee reviewed the documentation and provided Dr. Herrick with further elaboration on the SSC's April comments regarding the economic analysis ([3]). At this (June 2005) meeting, Dr. Herrick provided the SSC with an updated version of his processor data documentation ([4]), as well as a draft environmental assessment (DEA) pertaining to an updated list of allocation alternatives ([5], [6]).

The SSC appreciates Dr. Herrick's responsiveness to many of the concerns expressed at the April meeting and later by the Economics Subcommittee. Specifically, Dr. Herrick has (1) provided an analysis of alternatives based on the exvessel value of landings, (2) elaborated on the assumptions underlying his economic analysis (e.g., stability of exvessel prices), and (3) provided a rationale for not considering fixed costs in his analysis (namely, given the expected stability of processing capacity over the likely duration of the pending sardine allocation, fixed costs are likely to "wash out" in comparison of alternatives). The analysis provided in the DEA is primarily a short-run analysis.

The analysis of alternatives is based on actual 2004 sardine landings in the southern and northern subareas, projected forward to 2005-2009. Appendix B of the DEA describes the effect of each alternative in terms of catch, catch shortfalls, the frequency of catch shortfalls, and unutilized harvest guideline (HG) in each year under a range of assumptions regarding the HG (72,000 mt, 136,000 mt, and 200,000 mt) and the annual growth rate of landings in the southern and northern subareas (0%, 5%, 10%, 15%). The analysis of alternatives contained in the main body of the DEA focuses not only on catches and shortfalls (as analyzed in Appendix B), but also economic effects at the exvessel and processor levels and salmon bycatch effects. Like Appendix B, this analysis was conducted using three different HG scenarios; unlike Appendix B, the analysis assumes that sardine landings in the southern and northern subareas will grow at a uniform rate of 10%.

The SSC notes the following regarding the analysis of harvest, exvessel, and processor effects:

§ According to Tables 4-7 and 4-8 (pp. 45 and 51 of the DEA), harvest opportunities in the southern and northern subareas are largely unconstrained under the base case scenario and completely unconstrained under the high HG scenario. The low HG scenario, however, is instructive in terms of illustrating the relative effects of each alternative on the southern and northern subareas when the HG has a constraining effect on landings.

- § Appendix B of the DEA indicates that catches and catch shortfalls in the southern and northern subareas are sensitive to the underlying growth rate assumptions. However, the analysis of alternatives contained in the main body of the DEA is based on an assumption of 10% growth in both subareas. The rationale for the 10% assumption is not clear. (For instance, this assumption does not reflect the recent history of the fishery, which is more consistent with growth rates of 0% in the southern subarea and 5% in the northern subarea.) Given the sensitivity of the results to different growth rates, it is important that the effects of the alternatives on catches and catch shortfalls (as described in Appendix B for a range of growth rates) be incorporated into the main text of the DEA. Additionally, effects of the alternatives on exvessel value and producer surplus, as described in Tables 4-7 and 4-8, should include the growth rates covered in Appendix B.
- § An important distinction among the alternatives is the extent to which they are based on geographic or seasonal allocation. Thus, for instance, fishery participants desiring a guaranteed share of the HG are likely to be receptive to geographic allocations (like alternative 7), whereas those desiring to take full advantage of harvest opportunities as they arise are likely to prefer seasonal allocations (like alternative 3). This distinction should be made explicit in the analysis of alternatives.
- § Alternative 6 provides rules for transferring a portion of the HG from one subarea to another, based on the extent of each subarea's utilization of its previous year's allocation. While this alternative provides an adaptable and flexible basis for allocation, applying rules of this type to a variable fishery (like sardine) may result in anomalous outcomes, in which the feedback from the previous year may be ill-suited to fishery conditions in the current year.
- § Table 4-1 (p. 30 of the DEA) provides criteria for evaluating whether the socioeconomic effects of the alternatives are "significantly adverse," "insignificant" or "significantly beneficial." For instance, the effect of an alternative on producer surplus is deemed "significantly adverse" if either subarea's share of producer surplus is less than 40% of the total under any HG scenario. The SSC notes that, while the southern subarea's share of producer surplus (described in Table 4-8) is consistently above 40%, it is generally so close to this threshold as to be indistinguishable from it. Given the many uncertainties in the analysis, the SSC cautions against characterizing the alternatives on the basis of absolute numeric thresholds (as done on pp. 56-57 of the DEA) unless a coherent rationale is provided for the threshold.
- § The estimates of producer surplus provided in Table 4-8 are based on regional cost and revenue information provided by processors in southern California, northern California, and Oregon/Washington. The data were collected using a "Delphi type process" rather than statistically-based sampling methods. While the SSC recognizes the potential usefulness of group-based methods of data collection, it is important that such methods be validated to ensure results are representative and amenable to consistent interpretation across regions. Absent such validation, the producer surplus estimates should be viewed with caution and may be potentially biased. Generally speaking, industry data collections are best completed outside the context of the immediate management issue.

Ms. Liz Petras (National Marine Fisheries Service [NMFS], Southwest Region [SWR]) discussed the methodology for estimating salmon bycatch under the various sardine allocation alternatives (Table 4-3 on p. 39 of the DEA). This methodology involved: (1) projecting 2004 sardine landings to 2005-2009, based on an annual growth rate of 10% (as done in the economic analysis), (2) applying average salmon bycatch rates estimated from an observer program conducted by Washington Department of Fish and Wildlife (WDFW) to projected sardine landings, (3) estimating salmon bycatch by evolutionarily significant unit (ESU), based on the assumption that the stock composition of chinook and coho landed in the Oregon/Washington commercial sardine fishery is similar to the composition landed in the recreational salmon fishery north of Cape Falcon, and (4) assuming 100% mortality of salmon bycatch. The SSC notes the following regarding the bycatch analysis:

- § According to Ms. Petras, any ESA consultations regarding salmon bycatch in the sardine fishery conducted by the SWR would be based on actual sardine landings, HGs, and allocation formulas. Thus uncertainties regarding the sardine landings projections used in the allocation analysis are academic at this point.
- § The salmon bycatch rates reported in WDFW's observer program, which were the basis of the salmon bycatch analysis, are not necessarily applicable to Oregon and California, where sardine fisheries may operate differently and observer data are very limited. Observer programs in each state are needed to provide state-specific estimates of bycatch rates. There are currently no observer programs in Washington and Oregon.
- § Due to the unknown accuracy and precision for the estimates of bycatch impacts applied to specific salmon stocks, it is difficult to assess the potential impact to salmon stocks of concern, especially if the northern sardine fishery were to expand. An observer program, including non-lethal collection of tissue samples for genetic analysis, would allow a better assessment of stock-specific impacts.
- § An important issue for consideration in the salmon preseason planning process is whether salmon bycatch in the sardine fishery should be treated as a component of natural mortality or included in the salmon ocean exploitation rate.

References:

- [1] DOC, NMFS, SWR & SWFSC. April 2004 [sic]. *Allocation of the Pacific Sardine Harvest Guideline - Amendment 11 to the Coastal Pelagic Species Fishery Management Plan - Preliminary Alternatives Analysis* (PFMC Briefing Book, Agenda Item F.2.b, NMFS Report, April 2005).
- [2] *Allocation of the Pacific Sardine Harvest Guideline - Amendment 11 to the Coastal Pelagic Species Fishery Management Plan - Preliminary Alternatives Analysis. April 2005 Briefing Book Version - Errata Sheet* (PFMC Briefing Book, Agenda Item F.2.b, Supplemental NMFS Report 2, April 2005).
- [3] SSC Economics Subcommittee. May 24, 2005. *Comments on Survey Methodology and Results for Collection of Economic Data Used in the Analysis of Long-Term Allocation Options for the Pacific Sardine Harvest Guideline.*
- [4] Herrick, Samuel F. Jr. May 2005, Revised June 2005. *Survey Methodology and Results for Collection of Economic Data Used in the Analysis of Long-Term Allocation Options for the Pacific Sardine Harvest Guideline.*
- [5] DOC, NMFS, SWR and SWFSC. June 2005. *Allocation of the Pacific Sardine Harvest Guideline - Amendment 11 to the Coastal Pelagic Species Fishery Management Plan - Draft Environmental Assessment, Regulatory Impact Review & Regulatory Flexibility Analysis* (PFMC Briefing Book, Agenda Item F.2.b, Attachment 1, June 2005).
- [6] *Supplemental Material to the Draft Environmental Assessment - Allocation of the Pacific Sardine Harvest Guideline - Amendment 11 to the Coastal Pelagic Species Fishery Management Plan* (PFMC Briefing Book, Agenda Item F.2.b, Supplemental Attachment 2, June 2005).

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