

## COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON PACIFIC SARDINE STOCK ASSESSMENT AND MANAGEMENT MEASURES

The Coastal Pelagic Species Management Team (CPSMT), along with the Scientific and Statistical Committee's Coastal Pelagic Species Subcommittee (Subcommittee), received a presentation on the 2008 Pacific Sardine stock assessment update from Dr. Kevin Hill. The CPSMT recommends the assessment update (noted as the "Strict Update" in the assessment and the remainder of this report) that uses all of the available data and most strictly adheres to the 2007 CPS terms of reference (TOR). This update resulted in a biomass (ages 1+) estimate of 662,886 mt and from the harvest control rule, an acceptable biological catch (ABC) for the 2009 fishery of 66,932 mt. This ABC is 25 percent less than the 2008 ABC/harvest guideline (HG) adopted by the Council (November 2007).

The CPSMT disagrees with the Subcommittee concerning the degree of consistency that the Strict Update has with respect to the 2007 stock assessment data and modeling results. In particular, the CPSMT-recommended Strict Update includes all new available data (i.e., 2007-08 landings, 2007-08 age/length distributions, and the Daily Egg Production Method estimate produced from the California Cooperative Oceanic Fisheries Investigation survey in April 2008), whereas the Subcommittee-proposed 2007 update projection includes only new landings (2007-08) data. Further, evaluating consistency in results in ongoing assessments is inherently difficult, given model uncertainty. For example: (1) parameterization of a single length distribution (2007-08 Pacific Northwest (PNW) fishery) indicates that the overall model, both current and future, is highly sensitive; and, (2) estimated biomass from each of the updates must necessarily be evaluated on a past, current, and future basis. Finally, the above issues are related to the current TOR, and are addressed in the CPSMT statement on revised TOR for CPS stock assessment updates (Agenda Item C.1.c).

The CPSMT also considered an assessment update proposed by Dr. Hill in which the parameterization of the 2007-08 PNW length composition was adjusted to more closely reflect model-estimated (effective) sample sizes. This modification to the model, when using all the new available data, resulted in improved consistency with the 2007 assessment. Although such model tuning is a common practice in stock assessments that are based on integrated statistical methods, it did not comply with the TOR for an assessment update, and therefore the CPSMT is not recommending it for further consideration by the Council.

The CPSMT notes that all three of the assessment updates that it considered would result in nearly the same age 1+ biomass estimates for the 2009 fishing season, follow generally similar trajectories, and are well within all projected confidence intervals. Moreover, due to the dynamic annual fluctuations in CPS like sardines, forward projections to evaluate impacts of different catches are not practicable, so the CPSMT cannot characterize the biological risk associated with adopting harvest levels different than the base model. The CPSMT notes that the uncertainty associated with forward projections is precisely the reason sardine assessments are conducted annually.

Given this situation, the CPSMT does not see the need to unnecessarily reduce fishing opportunity. Therefore its decision to recommend the strict assessment update over the Subcommittee projected update is further supported on the basis that all else being equal, this update would result in a lesser negative economic impact in terms of potential revenues to industry from harvesting the resulting HG.

**Management Measures**

As has happened in 2008, there is a high probability that each directed seasonal allocation of the recommended 2009 HG, 66,932 mt, could be reached prematurely. The CPSMT agrees with the CPSAS on the need for (1) a total incidental catch set aside of 6,500 mt for the 2009 fishing season and, (2) a set aside of 1,200 mt for industry research -- to be deducted from the HG before it is allocated (Table 1).

Further, the CPSMT feels that the first two incidental catch amounts should each be set to 1,000 mt and that the last incidental amount should be set to 4,500 mt to account for management uncertainty in addition to incidental sardine catch in other fisheries (Table 1). This means that any overage in the directed sardine fishery in the third period would be deducted from the 4,500 mt incidental set aside in the third period. The CPSMT is in agreement with the CPS Advisory Subpanel regarding the inseason automatic actions that should be taken to deal with surpluses or shortages that may occur for the direct and incidental seasonal allocations, and that the incidental landing allowance be no more than 20 percent Pacific sardine by weight. The CPSMT recommends that if both the adjusted seasonal allocation and the seasonal incidental/management uncertainty set-asides are reached or exceeded in any period, the retention of Pacific sardine be prohibited.

**Table 1. Allocation scheme for the 2009 Pacific Sardine HG.**

HG = 66,932 mt Research set aside = 1,200 mt Adjusted HG = 65,732 mt				
	Jan 1- Jun 30	Jul 1- Sep 14	Sep 15 – Dec 31	Total
Seasonal Allocation (mt)	23,006	26,293	16,433	65,732
Incidental Set Aside (mt)	1,000	1,000	4,500	6,500
Adjusted Allocation (mt)	22,006	25,293	11,933	59,232

The CPSMT recommends the Council encourage National Marine Fisheries Service (NMFS) to continue to fund comprehensive coastwide annual CPS research, including the survey off the PNW to fully evaluate the contribution of PNW sardine to the spawning biomass as a whole, and encourage similar cooperative surveys in Canada and Mexico. The CPSMT also encourages cooperative research with the fishing industry and other interest groups as in the case of the industry-supported sardine aerial survey in the PNW and possible expansion off California to develop a coastwide index. The CPSMT continues to believe strongly that coordinated

international management of CPS fisheries is essential to avoid the potential for coastwide overfishing. The CPSMT encourages the Council, NMFS and the State Department to continue working to achieve timely receipt of biological research data from Mexico.

PFMC  
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