

## COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON PACIFIC SARDINE HARVEST FRACTION

In March 2014, the Coastal Pelagic Species Management Team (CPSMT) presented a report that considered how use of a new sea surface temperature (SST) index for Pacific sardine management would maintain or deviate from existing policy. In addition to recommending use of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) temperature index to replace the Scripps Institution of Oceanography (SIO) pier index, the CPSMT recommended modifying the FRACTION bounds for the harvest guideline (HG) harvest control rule (HCR) from 5-15 percent to 10-20 percent as consistent with the current harvest policy and control rule.

At the March 2014 meeting, the Council adopted the new CalCOFI index and temperature-productivity relationship to calculate the annual overfishing limit (OFL) and acceptable biological catch (ABC) for implementation in April 2014, when management for sardine was determined for the fishing year beginning July 1, 2014. To accommodate regulatory timelines, the harvest guideline (HG) FRACTION continued to include the SIO index for the 2014-2015 fishing season.

The March report analyzed two options for FRACTION: 5-15 percent and 10-20 percent. The Council also requested analyses of alternate HG FRACTION bounds of 5-20 percent and 0-20 percent, to consider in addition to the recommended 10-20 percent option. The CPSMT submitted a preliminary draft Environmental Assessment (EA) for this meeting that examines all of these alternatives (Agenda Item C.1.a, Attachment 1).

Additional analyses of the alternatives in the EA show very little difference among Alternatives 2 and 3a-c (Table 1 of the EA, below). Results for biological and economic performance measures are very similar, reflecting little influence of low-bounding the HG FRACTION at 0 or 5 percent on long-term results compared to 10 percent. This is due to the precautionary effect of the ABC and HG control rule interaction under lower temperatures and biomass.

At the March 2014 Council meeting, the CPSMT report (March Agenda Item I.1.c), the CPSMT recommended HG FRACTION bounds of 10-20 percent to better reflect both the increased productivity of the sardine stock (stochastic  $E_{msy}$  increased from 12 percent under Amendment 8 to 18 percent in the new model), and to more closely align with observed temperature ranges as seen with the 5-15 percent range under SIO temperatures (see Figures 1 and 2 from the March 2014 report, below). For these reasons, and the similarity of simulation results for the alternatives, the CPSMT continues to support Alternative 3a as consistent with existing harvest policy.

The HG is but one control rule used for management, interacting with the others to conservatively manage the Pacific sardine stock. Based on analyses to date, the CPSMT believes the change in temperature index to CalCOFI and the team's recommendation of Alternative 3a will maintain the Council's precautionary approach in adopting the suite of HCRs (OFL, ABC, HG) under Amendments 8 and 13 of the Coastal Pelagic Species Fishery Management Plan, including accounting for scientific and management uncertainty.

The CPSMT recognizes the importance of regular evaluation of the SST index. Reviews of the index should be periodically conducted to ensure best available science is used in determining sardine HCRs.

The CPSMT understands that the SSC has recommended additional analyses. The CPSMT is willing to consider these SSC recommendations; however, the team does not believe additional simulation model runs are necessary for Council action on this issue.

PFMC  
09/12/14

**Table 1.** Fishery performance measures of action alternatives. Biomass and catch units are 1,000s of metric tons.

<b>Alternative</b>	<b>2</b>	<b>3a</b>	<b>3b</b>	<b>3c</b>
HG FRACTION ( percent)	5-15	10-20	5-20	0-20
OFL E <sub>MSY</sub> (%)	0-25	0-25	0-25	0-25
CUTOFF	150	150	150	150
MAXCAT	200	200	200	200
<b>Performance Measures</b>				
<i><b>Biological</b></i>				
Mean B1+ (SD)	1220 (888)	1182 (883)	1186 (882)	1187 (881)
Mean SSB (SD)	945 (757)	911 (753)	915 (752)	916 (751)
%B1+>400	92	91	92	92
Depletion (B1+ percent)	78	75	75	76
<i><b>Economic</b></i>				
%No catch	4.7	4.7	4.8	5.1
%Catch<50	31	31	31	31
Median catch	97	107	107	107
Mean catch all (SD)	106 (73)	112 (75)	111 (75)	111 (76)

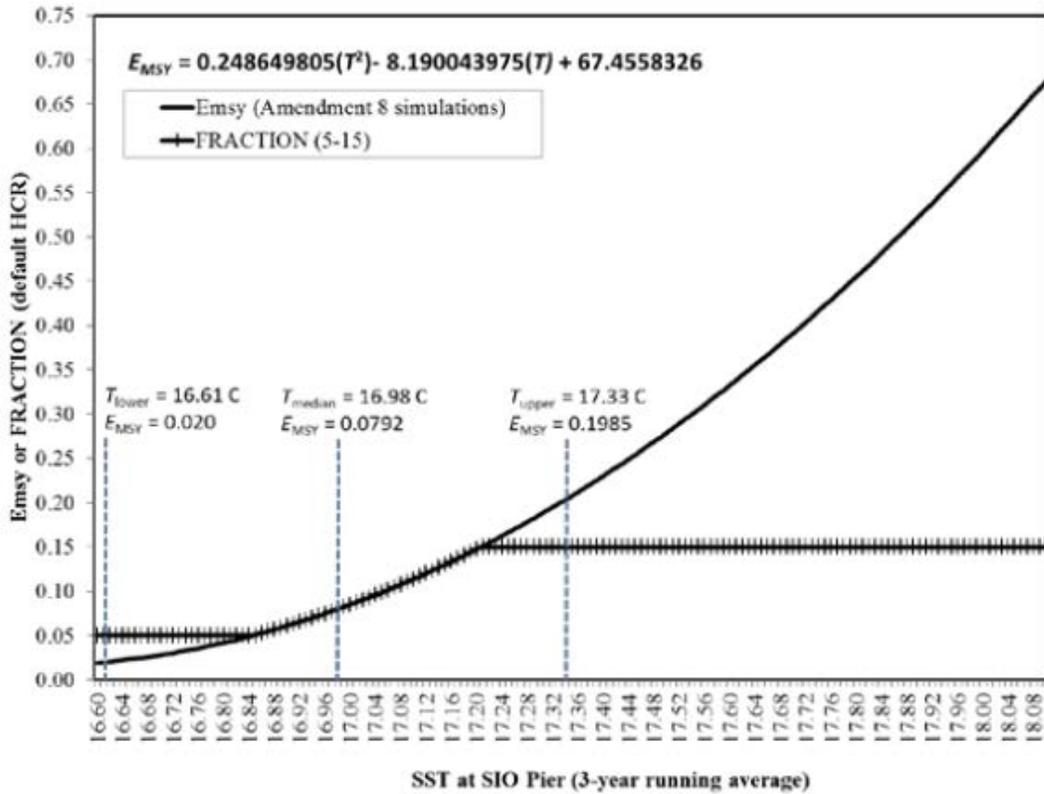


Figure 1. Emsy and FRACTION based on SST at SIO Pier; Amendments 8 and 13.

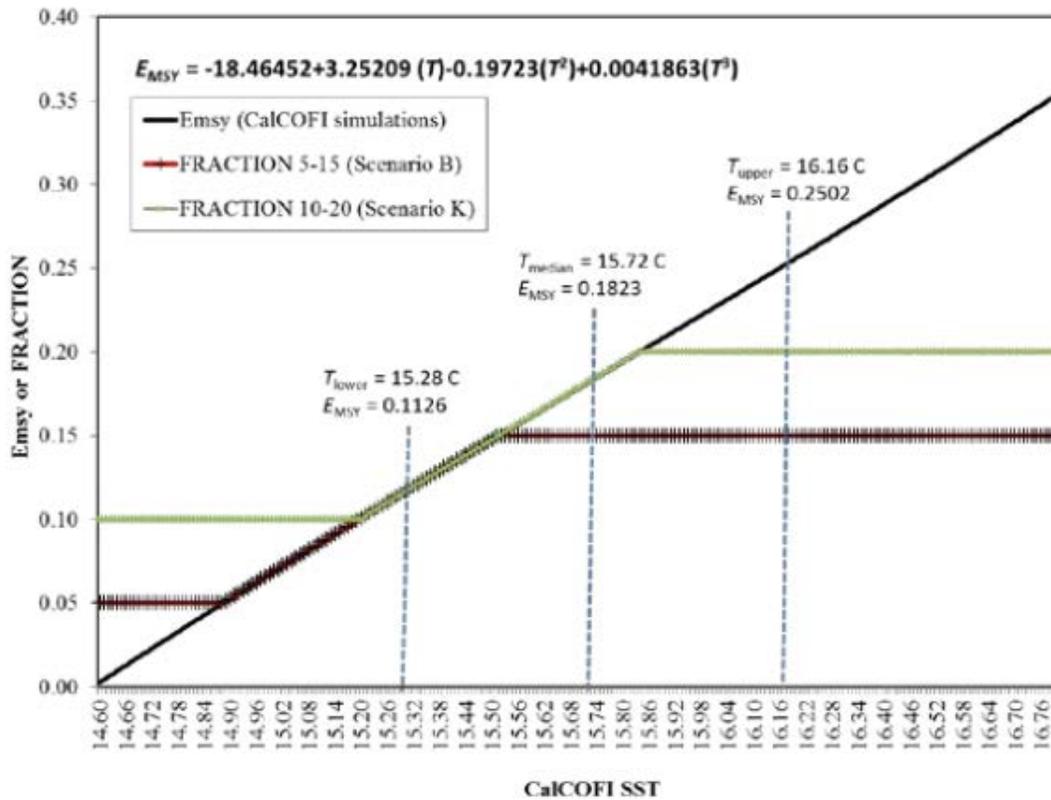


Figure 2. CalCOFI SST and Emsy from Hurtado & Punt (2014); FRACTION bounded at 5-15 (Scenario B) and at 10 -20 (Scenario K).