SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON SARDINE REBUILDING PLAN

Dr. Kevin Hill (National Marine Fisheries Service [NMFS] - Southwest Fisheries Science Center, Coastal Pelagic Species Management Team) spoke to the Scientific and Statistical Committee (SSC) via webinar about his plans to produce a Pacific sardine rebuilding analysis using the Rebuilder software that has been used for groundfish. NMFS notified the Pacific Fishery Management Council (Council) that the northern subpopulation of Pacific sardine was declared overfished in July 2019 and a rebuilding plan must be submitted to NMFS no later than October 2020. The SSC notes that this analysis must be completed in a short time frame and that a relatively simple approach is preferred. Pacific sardine productivity is highly variable and environmentally dependent. There has been almost no directed fishing in U.S. west coast waters for Pacific sardine since 2015, except for low levels of live bait and other minor directed fishing allowed per the Coastal Pelagic Species Fishery Management Plan.

The technical aspects of a rebuilding analysis relate to: (a) the target biomass (usually B_{MSY} or a proxy thereof), (b) how future recruitment is generated, (c) the future harvest scenarios, and (d) the way the parameters of the population model are set. The proposed rebuilding analysis will use output from the 2020 benchmark assessment to set the parameters of the population model. Dr. Hill proposed two time periods of recruitment to define the unfished biomass (SB_0) and hence B_{MSY}: 2005-2018, a period of high to low recruitment and 2010 – 2018, a period of low recruitment. He also proposed to use these two time periods as the basis for generating future recruitment. At least two rebuilding alternatives will be explored: (1) a set of catches that is intended to represent the status quo, and (2) zero U.S. harvest (no live bait or incidental catch in the domestic fishery). Under both alternatives, the models will assume recent Mexican catches; however, T_{MIN} (the biologically minimum time predicted for the stock to rebuild) will be calculated assuming no future Mexican or U.S. catch.

The SSC endorsed the use of the Rebuilder as the basis for the rebuilding analysis, setting the model parameters using the 2020 benchmark assessment, and calculating the B_{MSY} proxy by projecting forward under $E_{MSY} = 0.18\ yr^{-1}$. The SSC agreed the two time series of recruitment capture plausible future productivity scenarios. However, rather than sampling recruitments from each time series, the SSC recommends using a stock-recruitment relationship to generate future recruitment. There is considerable uncertainty regarding the steepness of the stock-recruitment relationship for Pacific sardine, and the rebuilding analyses should account for this uncertainty, as was the case for the cowcod and yelloweye rockfish rebuilding analyses.

The SSC briefly discussed the economic analysis that will be included in the rebuilding plan and offers the following suggestions. The relative economic impacts of the rebuilding alternatives on other fisheries that catch sardines incidentally could be important and should be compared across alternatives. In addition, if there are major differences in rebuilding time probabilities associated with different alternatives, the discounted value of differences in the future value of the fishery associated with the directed fishery under each alternative should be evaluated and discussed. The

information on the recent use and value of sardine is focused almost solely on California and should be expanded to include the geographic range north of California when the population supported fishing in the Pacific Northwest. A discussion of the ecosystem service value associated with sardine as a forage fish would be beneficial.

The SSC recommends that the SSC Coastal Pelagic Species Subcommittee meet to review the analysis in July or early August 2020.

PFMC
06/12/20