

AFRF Newsletter Attachment - Results of Albacore Stock Assessment Working Group Meeting in Shimizu, Japan, June 3rd -12, 2011. – Dr. Vidar Wespestad

The albacore stock assessment was conducted June 3rd to June 12 and was preceded by a modeling subgroup meeting that prepared the models for analysis and evaluation by the entire working group. Two separate modeling platforms were used; a stock synthesis simulation model in which all data are fit simultaneously to compute a population trend that best fits available fisheries and biological data, and a VPA analysis that does a statistical fit of data based on estimates of fishing mortality in the most recent year and at the oldest age. Both models showed the same trend but different levels of biomass. The Working Group decided that with the agreement of VPA and stock synthesis that stock synthesis is the preferred platform and it will replace VPA as the principal model, and the working group will no longer utilize both models.

The results of the Stock Synthesis model are shown in Figure 1. The top panel shows the recruitment trend by year and the projected recruitment at the level of effort computed for 2002-2004 (base of last assessment) and 2006-2008 (base years of current assessment); the middle panel shows estimated and projected spawning biomass, and the bottom panel estimated and projected catch. The projections use random sampling of historic recruitment to estimate annual recruitment. It can be seen that albacore abundance increased through the 1990s to a peak around 2000. In recent years recruitment has been about average and the population is near the long term median which means that 50 percent of the time the stocks have been above the current level and 50% of the time below it.

The current level of effort is lower than that estimated in the prior assessment and there is no evidence that overfishing is occurring. Under current fishing mortality levels (F) and projected recruitment level the spawning stock biomass (SSB) is not expected to fall below historical median abundance. The Northern Committee had directed the WG to provide the West Central Pacific Fishery Commission to estimate where the stock abundance level relative to the reference point of the reference point SSB_{athl} . The WG computed this value and values for commonly used biological reference points. The following table shows the ratio of current F to reference point fishing mortality (F_{ref}) and the estimated spawning biomass and associated equilibrium yield for the various reference points; the first three are based on yield per recruit analysis and the last four are spawning biomass based proxies for F_{msy} as used for many groundfish stocks. In the case of maximum fishing (F_{max}) it can be seen that the current fishing level is far below it. The current fishing rate is very close to the $F_{0.1}$ and F_{50} levels, and below the commonly used MSY proxy rates. This means the current level of harvest is at very safe levels and a harvest round 100,000 t is possible without impacting future recruitment. In fact, actual potential harvest is likely greater since current estimates are based on very conservative estimates and parameters.

Reference point	F_{max}	F_{athl}	$F_{0.1}$	F_{20}	F_{30}	F_{40}	F_{50}
F_{curr}/F_{ref}	0.14	0.3	0.99	0.3	0.52	0.68	0.91
SSB	11186	107130	452897	171427	257140	342854	428567
Eq. Yield	185913	170334	94080	156922	138248	119094	99643

The working group concluded that if current average recruitment levels and fishing mortality is maintained the stock will remain near the median level until the time of the next assessment expected in 2014-15 and is advising the International Science Committee that no specific conservation actions are needed for North Pacific albacore. The final report is being edited and should be available within a few weeks, but the conclusions are firm and supported by all members of the Working Group.

This is the culmination of a multiyear process that has produced a very much improved assessment in terms of quality and transparency. Through the multiyear assembly of data and improvements in analysis a working model has been assembled that is very robust and should easily update in three years. In the interim there should be better age and growth data and a better understanding of the relationship of difficult to model fisheries like the Taiwanese and Hawaiian longline data that strongly influence the model to produce even better information. One thing clear is that there is minimal interest in albacore outside the US and Canada and keeping the process moving requires NMFS and DFO involvement to take initiative to make improvements and obtain required biological data. This in turn requires North American industry to maintain an open and productive dialogue with these agencies and provide political support.

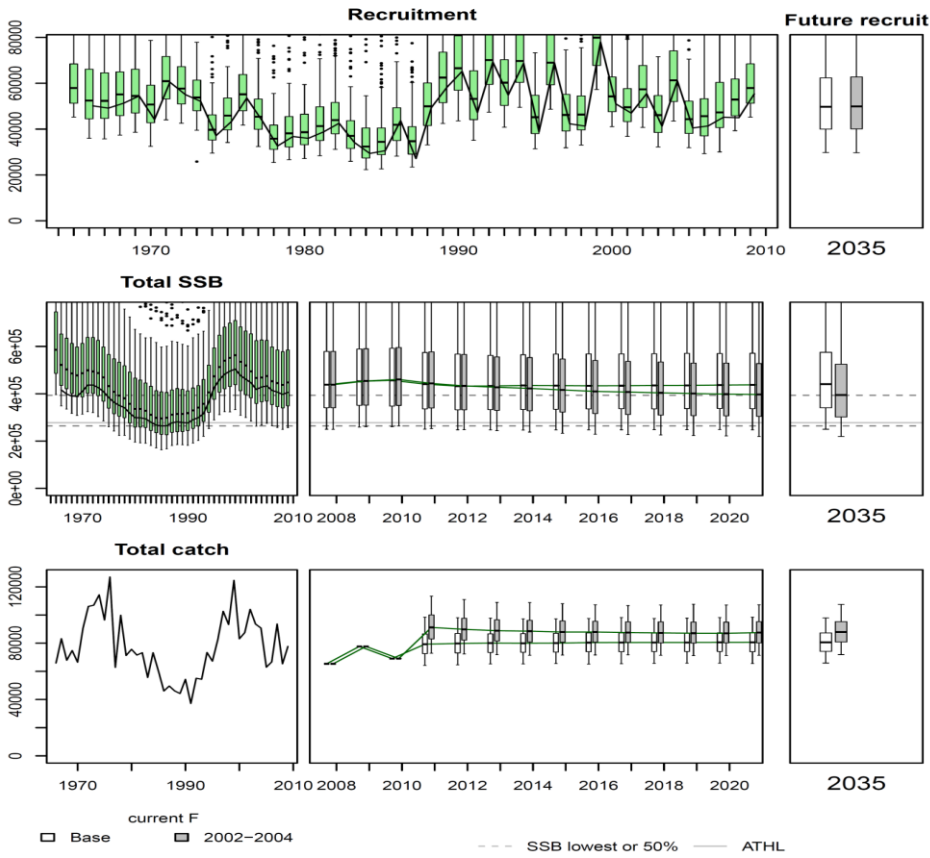


Figure 1. Past and future trajectories on recruitment (top), SSB (middle) and total catch (bottom), estimated with 2 harvesting scenarios of base case (F2006-2008) and F2002-2004.

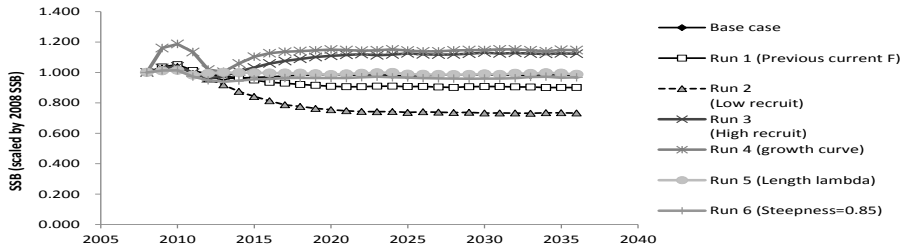


Figure 2. Comparison of median trajectories of SSB among 7 runs (above: absolute SSB, below: SSB scaled by 2008 level)

(b) Probability below bootstrap estimation

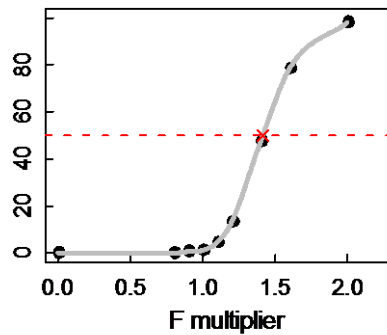


Figure 3. Example of bootstrap probability estimation function that future minimum SSB falling below the threshold of SSB ATHL.

