

STAR Panel Report

YELLOWTAIL ROCKFISH

Northwest Fisheries Science Center
Seattle, Washington, USA
15-19 August 2005

Stock Assessment Review (STAR) Panel Members:

Ray Conser (Chair), Southwest Fisheries Science Center & SSC representative
Chris Francis, Center for Independent Experts
Stratis Gavaris, Department of Fisheries and Oceans, Canada
Dan Kimura, Alaska Fisheries Science Center
Robert Mohn, Center for Independent Experts

Brian Culver, WDFW & GMT representative
Pete Leipzig, GAP representative
Mark Saelens, ODFW & GMT representative

Stock Assessment Team (STAT) Members Present:

John Wallace, Northwest Fisheries Science Center
Han-Lin Lai, Northwest Fisheries Science Center

General Overview

The STAR Panel met during of 15-19 August 2005 at the NMFS Northwest Fisheries Science Center in Seattle, WA. The Panel reviewed four stock assessments, namely full stock assessments for canary rockfish and lingcod; and updated assessments for yellowtail and yelloweye rockfish. Draft assessment documents and extensive background material (previous assessments, previous STAR Panel reports, etc.) were provided to the Panel in advance of the meeting. In addition, an FTP site was set up for Panel usage. The model input and output files for each assessment – along with the associated executable files – were uploaded to the FTP site prior to the Panel meeting. Finally, the Panel set up a file server in its meeting room to provide common access to all presentation material and the additional model runs that were conducted during the course of the Panel meeting.

For each stock assessment, the STAT presented its draft assessment document to the Panel and entertained questions and clarifications during the course of the presentation. The Panel then requested additional model runs designed to clarify aspects of model behavior and/or to rectify problems found in the draft assessment. After allowing sufficient time for the STAT to complete the additional work, the Team was asked to present the results on the new model runs and its interpretation of whether a base case had been achieved. Where possible, this process was repeated until a consensus base case – including an adequate representation of the uncertainty – was achieved.

The Panel wrote the first draft of its report during the course of the meeting and as scheduling allowed, reviewed the draft with the respective STATs on the final day of the meeting. Finally, the Panel agreed to have its Chair complete a final version of the report and have it reviewed by other panel members via email after the meeting.

Yellowtail Rockfish Overview

The STAR Panel reviewed a draft assessment by the STAT for yellowtail rockfish. A draft report was provided to the STAR panel members in advance of the meeting and additional analyses were presented during the meeting. This yellowtail rockfish assessment is an “update” assessment; and the Panel agrees that the assessment satisfies the requirements for an update only assessment. The model is unchanged since the 2003 assessment and the Panel considers that the projections from this model should provide an adequate basis for fishery management decisions. The model is run separately for the South Vancouver, North Columbia, and Eureka areas. The overall indication was that yellowtail rockfish, while experiencing a decline in abundance and reduced recruitment, was not in an overfished state and was not being overfished. The Panel concluded that this assessment provides an adequate basis for fishery management decisions.

Analyses Requested by the STAR Panel

Requests from the Panel (8/15/05):

1. Use catch at age data to explore a VPA analysis and compare results.
2. Explore the drop and bounce in modeled biomass for the South Vancouver area in 2003 to see what might be the cause of this unusual behavior.

3. Provide a summary table of parameters showing which parameters are estimated, whether they have bounds, what are their likelihood weightings, etc.
4. The observed-predicted age proportion residuals were not standardized. The Panel requested the residual plots be standardized so their variation could be judged for reasonableness.

Provided by the STAT team (8/16/05):

1. Catch at age data was used to conduct a VPA for the South Vancouver area with exploitation pattern at age similar to that of the base model and assuming an arbitrary “ballpark” abundance at age 12. Ignoring the most recent few years, since calibration was not attempted, recruitment, biomass and fishing mortality trends were similar to those from the base model.
2. The drop and rebound in the South Vancouver biomass can be explained by the unusually low average weight at age in 2002 and 2003. Weight at age was estimated from the von Bertalanffy growth curve and a length weight relationship on an annual basis. Substituting an average weight at age (from fish sampled during 2001 and 2004) for 2002 and 2003 corrected the apparent dip in biomass.
3. A table was provided with: feature, value, status, standard deviation, and role. The specifications were discussed row by row with the Panel.
4. The original plot of age proportion residuals were standardized so that their variation could be judged.

Further Requests from the Panel (8/16/05):

1. The Panel suggested that the 10 year projections for South Vancouver and North Columbia areas be carried out with average recruitment (1967-2005) and recent average recruitment (1994-2005), and various fishing levels (F40%, F50%, and F66% (i.e. current fishing rate)). For the Eureka area, it is suggested that only one set of projections based on long term average recruitment be used. The Panel suggests that projections based on current recruitment be given greater emphasis.
2. For 2006 projections only, it is recommended that uncertainty in current biomass be accounted for and analysis based on a normal error on natural logarithm of current abundance estimates. Confidence intervals of F40%, F50%, and F66% catches can then be tabulated, conditioned on this distribution (see Fig. 13 of yellowtail draft assessment).

Provided by the STAT team (8/19/05):

1. The Panel’s request for 10 year projections using the two levels of recruitment and 3 levels of fishing mortality rate were carried out.
2. Also the cumulative confidence distribution of projected catch for 2006, when fishing is at the F40%, F50%, and F66% rates were calculated.

The Panel believes that these projections should provide an adequate basis for fishery management decisions.

Final Base-Case Model and Quantification of Uncertainty

The new base model is the 2003 model with the updated data described below.

Updated Data:

1. Catch biomass updated from (1967-2002) to include 2003-2004.
2. Catch at age updated from (1967-2002) to include 2003-2004.
3. Weight at age updated from (1967-2002) to include 2003-2004.
4. Triennial survey biomass updated from (1970,...,2001) to include 2004.
5. Triennial survey numbers at age updated from (1970,...,2001) to include 2004.

Abundance Indices Not Updated:

1. Whiting Bycatch Index (1978-1999).
2. Domestic Trawl Logbook CPUE Index (1988-1999).

Uncertainty for short-term projections was based on the statistical estimation uncertainty, assuming a normal error on logarithm scale of population abundance in the terminal year of the assessment.

Technical Merits and Suggestions for Improvement in Assessments

The Panel noted the following anomalies in the model specification:

1. The survey selectivity was the same for both sexes due to the absence of sex information for ages in all but the most recent years.
2. The whiting bycatch index is weighted much higher than the triennial survey, even though the triennial survey would seem to be the more valid index. The 'fix' used was to allow year-specific q for the whiting index, which effectively discounted its abundance signal in the model. It may have been preferable to drop the index entirely.
3. It was noted that the proportion females in the catch data could not be replicated in the model.
4. There appeared to be little information in the yellowtail age distribution data, as the residuals were large and often non-random.

The Panel viewed these VPA results as corroborating the results from the STAT team's base model, and concluded that the STAT team's base model provides an adequate basis for fisheries management.

Areas of Disagreement Regarding Star Panel Conclusions

There were no areas of disagreement concerning this assessment.

Unresolved Problems and Major Uncertainties

The panel noted that none of the available abundance indices appear to provide adequate information for a yellowtail stock assessment. Due to the semi-pelagic nature of yellowtail rockfish, the availability to demersal survey trawls and commercial bottom trawls appears highly variable even over short time periods. The problem is both obvious and acute for the Triennial trawl survey, where survey fluctuations are far beyond expected variation. Whiting gear, on the other hand, appear to only marginally sample yellowtail rockfish. In recent years, the whiting fishery and domestic trawl fishery are

thought to be actively avoiding rockfish, further reducing the value of these indices in future yellowtail stock assessments.

Recommendations for Yellowtail Rockfish

1. Figure out the root cause of the low average weight at age in South Vancouver in 2002 and 2003. The actual cause of this problem is unclear, but may involve instability in fitting von Bertalanffy parameters, sampling, ageing, or penalties in the model.
2. The major hindrance to yellowtail stock assessments is lack of a credible abundance index. A major effort should be made to develop a credible abundance index for yellowtail rockfish. This may need to involve new survey technology.
3. Considering that the last full assessment of yellowtail was conducted in 2000, and the stock assessment model software currently in use is no longer being updated or maintained, a full assessment of yellowtail should be considered in the next assessment cycle.

Recommendations for All Assessments Reviewed by this STAR Panel

- This panel reviewed four stock assessments within a contiguous 5-day period of time. Each of the assessments comprised a unique, complex mix of data attributes and related shortcomings; biological information; assessment models and related assumptions; and presentation style of the respective STAT. The panel found it quite challenging to absorb all of the details associated with each assessment, and quite frustrating to keep those details correctly in mind as the presentations cycled repeatedly through the four species under review. Future STAR panels should not be asked to undertake the review of more than two stock assessments with a 5-day period.
- Three of the four species considered by this STAR panel were in an overfished state and being managed under a Pacific Council rebuilding plan (canary rockfish, lingcod, and yelloweye rockfish). In principle all stock assessments should receive the same level of review. However, in practice there is a natural tendency to examine overfished stocks more closely, necessitating a greater amount of time needed per stock. If future reviews can be limited to two stocks per 5-day STAR panel (as recommended above), then overfished stocks may not be an issue. However, if this cannot be done then minimally, future STAR panels should not be asked to review three species that are in an overfished state within a single 5-day panel meeting.
- A significant time management constraint during STAR panel meetings is the time available for STAT members to make additional runs, synthesize the results, and prepare the new material for presentation to the panel. This becomes especially time critical when multiple iterations are needed for each assessment. For future STAR panels, an individual stock assessment scientist should not serve on more than one of the STATs involved in the review.

- The Panel found the FTP site, file server, and printer that were set up for its use to be extremely valuable in conducting its work; and recommends that this become standard procedure for all future STAR panels.

Acknowledgements

The Panel thanks all of the STATs for their cooperation and hard work during the course of the review. Special thanks also to the NWFSC and particularly to Stacey Miller for graciously hosting the meeting and providing administrative support for the Panel.