SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON STOCK ASSESSMENTS FOR 2009-2010 GROUNDFISH FISHERIES

FULL STOCK ASSESSMENTS

Sablefish

Dr. Michael Schirripa (of the Stock Assessment Team [STAT]) presented an overview of the 2007 sablefish stock assessment to the Scientific and Statistical Committee (SSC). Dr. Martin Dorn presented an overview of the Stock Assessment Review (STAR) Panel report.

Efforts were made by the STAT to reduce the complexity of the current assessment compared to previous assessments. Major changes include not utilizing pot survey and fishery logbook data, reducing from 5 to 3 the number of commercial fisheries in the model, and the addition of the Northwest Fisheries Science Center (NWFSC) shelf survey. The sablefish assessment continues to use sea surface height (SSH) as a predictor of recruitment. These environmental data are incorporated in a technically superior way compared to the previous assessment. One result of these changes and the addition of the most recent data is that the model now provides a plausible estimate for steepness.

The estimate of spawning biomass remains highly sensitive to estimates of NWFSC slope survey catchability. A preliminary model fixed this value at 1, while the model fit best with a much lower value. The STAR Panel created a prior for survey catchability based on informed consensus opinion. The median of this prior ($Q = 0.56$) was used for the base model, whereas the full prior distribution was used to calculate high and low states for nature for the decision table.

There were two unresolved areas of disagreement between the STAT and the STAR Panel as noted in the STAR Panel report. The SSC worked with the STAR chair and the STAT to resolve these issues. There was considerable discussion among the SSC, STAR Chair and STAT about the use of SSH in the assessment. The SSC concurs with the STAT and endorses the use of SSH in the current assessment but notes that much more work needs to be done toward evaluating the selection and validation of environmental signals in stock assessments as was recommended following the Groundfish Harvest Policy Evaluation Workshop in December, 2006. The inclusion of SSH had only a small influence on estimated depletion levels (in 2009: 38.6% with vs. 36.9% without the SSH data).

The base model estimates a 2007 spawning biomass of 93,895 mt and depletion level of 38.3%, both of which are somewhat higher than the estimates from the 2005 assessment. The higher estimates of current and historical biomass are largely due to the change in estimated survey catchability. The model also shows a rapid increase in spawning biomass since 2002 due to very strong 1999 and 2000 year classes.

The SSC endorses the use of the base model and decision Table 1 for Council decision making. The fourth section of decision table 1 represents the catch series that will stabilize the population at B_{40}% under equilibrium assumptions, whereas the rest of the table represents the standard decision table which uses the accepted F proxy (F_{45}%) to define catches. The document available for SSC review was still in draft form and needs to be fully updated to reflect the final base model and include all the required diagnostics. The STAT will provide a new draft to the STAR Panel members who will provide a review for completeness according to the assessment TOR before the document is finalized.

Longnose Skate

The SSC was given a presentation by Dr. Vladlena Gertseva on the assessment for longnose skate, and Dr. Martin Dorn provided a review of the STAR Panel findings. This initial assessment of longnose skate was performed using a single sex configuration of Stock Synthesis 2. The assessment is configured as one stock in U.S. waters from Canada to Mexico, and models a single fishery because 97% of all landings are trawl-caught. It includes catch data from 1916-2006, along with limited age data from the catches. Abundance estimates from four NMFS surveys since 1980 were sources of fishery-independent data, including survey length compositions since 1997. Longnose skate exhibit the life history traits of late maturity, low fecundity and slow growth. In addition, resilience of the stock was assumed to be low. The selectivity curve for the fishery allows full selectivity at 90 cm, which corresponds to fish that are only 10% mature. This could be a concern because the fishery is catching immature fish from a stock that is assumed to exhibit low productivity.

Dr. Gertseva noted that the estimates of spawning biomass in the May 23, 2007 version of the stock assessment report were double the correct values. However, none of the other assessment results or findings is affected by this correction.

Assessment results indicate that the spawning biomass slowly declined through the late 1960s, and has continued a general downward trend since then, but with fluctuations. The current biomass is within the range of 41-80% of unfished stock size, with a best estimate of 66%. The major sources of uncertainty in the results are: 1) the magnitude of the historical catches, and 2) the NWFSC shelf-slope survey catchability coefficient *Q*. These sources of uncertainty were used to develop alternative states of nature for the decision table. The stock is projected to remain above 40% of unfished stock size under the most likely catch scenarios for the next ten years, and only under the most aggressive catch scenario

($F_{45\%}$) combined with the most pessimistic state of nature (high *Q* and high historical catch) is the depletion level forecast to decline below 40% of unfished abundance. Considering that elasmobranches have distinct life history traits that differ from other groundfish, the default harvest rate for groundfish (F45%) is unproven and potentially too aggressive. The SSC endorses the STAR Panel conclusions that this assessment represents the best available science and can form the basis for Council decision-making.

UPDATED STOCK ASSESSMENTS

The Groundfish Subcommittee of the SSC met June 9-10 to review updated assessments of Pacific Ocean perch, cowcod, yelloweye rockfish, English sole, and widow rockfish. According to the terms of reference for stock assessment reviews, updates are appropriate in situations where a "model" has already been critically examined and the objective is to simply incorporate the most recent data. To qualify, a stock assessment must carry forward its fundamental structure from a model that was previously reviewed and endorsed by a STAR Panel. Any new information being incorporated into the assessment should be presented in enough detail that the review panel can determine whether the update satisfactorily meets the Council's requirement to use the best available scientific information. The groundfish subcommittee's review focused on two crucial questions: (1) did the assessment comply with the terms of reference for stock assessment updates and (2) are new input data and model results sufficiently consistent with previous data and results that the updated assessment can form the basis of Council decision-making. If either of these criteria were not met, then a full stock assessment was recommended.

While an update assessment is clear in concept, in practice there are often special issues that make it difficult to determine whether an assessment qualifies as an update. For the update assessments reviewed by the subcommittee, several such issues needed to be considered. These included 1) when correction of an error in the previous assessment had a significant impact on model results, and 2) when "new" data were added to early years in the assessement. Despite these considerations, it was generally clear which assessments were acceptable as an update.

The Groundfish Subcommittee prepared draft reports on each of the assessment updates. These draft reports were then reviewed and adopted by the full SSC.

English Sole

The SSC groundfish subcommittee reviewed a document entitled "Updated U.S. English sole stock assessment: Status of the resource in 2007", authored by Dr. Ian Stewart. Dr. Stewart gave a brief presentation and fielded questions from the committee.

The updated model was run with SS2 Version 2.00e. Two fleets (North and South) were modeled as operating on one coastwide stock. In the future it may be useful to look at the two areas separately.

The update incorporated a revised catch data series for 1981-2006 which resulted in a small increase in total landings. A substantial amount of new fishery age and length data were also incorporated into the update (predominantly new age data for the period after 2001). The update also used a new recruitment bias-correction option in SS2. Compared to the 2005 assessment, the net result of the changes made in the update had the effect of 1) increasing the magnitude of recent year classes and 2) increasing the estimate of B_0. The level of depletion in 2006 from the base case model is 116%, but is expected to decrease as the impact of recent strong recruitments diminishes.

The SSC determined that the English sole assessment update complied with the terms of reference for updates and is consistent with the previous assessment. The SSC endorses its use for Council decision-making.

Pacific Ocean Perch

Dr. Owen Hamel presented the Pacific Ocean perch update assessment, which incorporated recent survey and fishery data. The new data suggest continued rebuilding of the Pacific Ocean perch stock is occurring. The NWFSC slope survey shows a generally increasing trend, and there are indications of a strong 1999 year class in both the survey and fishery age composition data over several years. Assessment results are highly consistent with the previous assessment except that a stronger 1999 year class is estimated. The current assessment indicates that the 1999 year class is the strongest since the 1960s. The SSC determined that the Pacific Ocean perch assessment update complied with the terms of reference for updates and endorses its use for Council decision-making.

Widow Rockfish

The SSC groundfish subcommittee received a presentation on the update assessment of widow rockfish. The update, which indicates much stronger age-3 recruitment in 2003 than had been estimated by the last full assessment (conducted in 2005), projects that the stock of widow rockfish will exceed the rebuilding target of 40% of unexploited spawning biomass during 2009, largely because of the exceptional strength of this year-class. The projections further indicate that the stock could sustain fishery removals of about 2,000 mt annually. During the review of the update it was determined that the update assessment had not fully accounted for the bycatch of widow rockfish by the fishery for Pacific hake. The SSC recommends that the current update should be revised with updated catch statistics that correctly account for removals in recent years, but notes that the revised catch data should not substantively alter the results of the update. The SSC groundfish subcommittee will conduct an email review of a revised update prior to the September SSC meeting, at which time the revised update will be reviewed by the full SSC. The SSC determined that the widow rockfish assessment update complied with the terms of reference for updates. The SSC notes that future widow rockfish assessments will increasingly be compromised by the lack of a reliable tuning index for recent years.

Cowcod

The STAT, represented by Drs. Dick, Ralston, and Pearson, presented an updated stock assessment to the SSC. The last full assessment for cowcod was conducted in 2005. Attempts to update the cowcod assessment have resulted in substantial changes in depletion and historical exploitation rates. In addition the visual survey is less consistent with the 2002 population estimate from the 2005 assessment. Therefore, the cowcod assessment update as presented to the SSC did not fully meet the terms of reference. As such, the SSC recommends that a full assessment for cowcod be developed and considered for review at either the darkblotched or Mop-Up STAR Panel.

Yelloweye Rockfish

The stock assessment update for yelloweye rockfish was presented to the SSC by John Wallace. Landings, compositional data, and the catch per unit of effort (CPUE) time series were all updated through 2006 in accordance with the Terms of Reference. Some key issues identified in the update by the STAT were: (1) correction of a technical error in the definition of age and length classes, (2) deleting Washington trawl-caught fish from hook-and-line age compositions,

and (3) revising the natural mortality rate upwards from 0.036 to 0.043 yr^{-1}. The update also considered the effect of including fishing trips that target halibut in the calculation of the Washington sport CPUE statistic, as well as the impact of dropping 2000 and 2001 from that particular time series. Neither of those two sensitivity analyses produced an appreciable effect on model outcome. Overall, the update with M = 0.043 is consistent with the previous assessment and the SSC endorses the update model with the revised natural mortality rate for use in status determination and management of the stock.

STATUS OF OTHER STOCK ASSESSMENTS

Shortbelly Rockfish

The SSC also reviewed the stock assessment for shortbelly rockfish conducted by the SWFSC, which was presented to the SSC by Dr. Field. This stock assessment was not reviewed by a Council STAR Panel with SSC participation. Rather it was reviewed using a structure similar to a STAR Panel (external reviewers, including a Center for Independent Experts [CIE] reviewer) and using the Council Terms of Reference for groundfish stock assessments. The SSC was asked to review this assessment primarily because NMFS solicited a review by the Council in order for it to be qualify as an assessment.

The assessment report does not provide estimates of accepted biological catch (ABCs) and optimum yield (OYs), the reviewers except for the CIE reviewer were not selected using the same process as for STAR Panels, and the record of how the review panel interacted with the assessment authors is not as complete as would be expected of STAR Panels reports. Therefore, this assessment does not fully satisfy the Council TOR for groundfish stock assessments. However, it represents improved knowledge about shortbelly rockfish and might be suitable for management purposes in place of inferences from the hydroacoustic surveys conducted during 1977 and 1980.

Dr. Field provided the SSC with the results of projections based a range of future sequences of catches, and these suggested that catches at the level of the current OY for shortbelly rockfish would lead to major reductions in abundance. However, catches of shortbelly rockfish are currently close to zero. If the GMT wishes to use the results from this assessment for management purposes, the SSC offers the following suggestions:

(a) the estimates of biomass for recent years are based on the greatest amount of data and are hence the most reliable;

(b) the trend in abundance from 1991 to the present is relatively reliable; and

(c) if ABCs and OYs are to be based on a survey estimate of abundance rather than the results of the assessment, the estimate of abundance for 1991 obtained by Ralston *et al*. (2003) should be preferred to the results of the 1977 and 1980 hydroacoustic surveys.

The SSC notes that the assessment of shortbelly rockfish does improve knowledge about one of the non-commercial species included in the Groundfish FMP and hence provides information relevant to further understanding the ecosystem impacts on the fish populations managed by the Council, as well as the implications of the choice between static and dynamic B_0. The SSC encourages additional assessments of species that are not of immediate management concern.

Review of assessments that come from outside of the normal Council process should ideally be scheduled as part of the "off year" science activities.

Finally, the SSC had access to the report by the CIE reviewer of the shortbelly rockfish assessment. The SSC notes that these reports contain general comments on assessment methodology and process, and recommends that summaries of the relevant parts of the CIE reports for the current round of stock assessments be made available to the SSC. In addition, the SSC recommends that Dr. Patrick Cordue (CIE reviewer on all of the 2007 Groundfish STAR Panels) participate at any "post-mortem" meeting as this will increase the ability to fine-tune the assessment and review process based on the experiences during 2007.

Blue Rockfish

Dr. Owen Hamel presented the draft Blue Rockfish STAR Panel report and Dr. Alec MacCall spoke to the STAT's response to the Panel report. The blue rockfish assessment was not completed during the Panel meeting (May 21-25th). Initially, the STAT presented two commonly-used stock assessment models (SS2 and A Stock Production Model Incorporating Covariates [ASPIC]). Due to several implementation problems with the SS2 model, the STAT preferred the ASPIC model. However, the STAR Panel did not consider the ASPIC-based assessment results adequate to support Council management decisions.

This STAR Panel reviewed three stock assessments (blue rockfish; black rockfish – south; and black rockfish – north). There was not sufficient time during the Panel meeting to work through the blue rockfish modeling issues and reach consensus. Dr. MacCall indicated that the STAT may be able to improve the ASPIC-based assessment over the next few months. The SSC supports the ASPIC work and encourages the STAT to also explore other models that may be able to utilize all of the available data, e.g. SS2 or a simple delay-difference model. If this is possible, the SSC recommends that a revised blue rockfish assessment be taken up at the Mop-Up STAR Panel in early October.

Black Rockfish -Southern Stock

Dr. Owen Hamel briefed the SSC on the recently completed STAR Panel review of the black rockfish assessment (May 21-25th). The Panel and the STAT were able to complete their work on the northern stock of black rockfish. For the southern stock, however, several important issues were not resolved. In the latter case, the Panel and the STAT concurred that the problems could be worked out over the next few months, and that a revised assessment could be tabled at the Mop-Up STAR Panel in early October. The SSC concurs and recommends that black rockfish (southern stock) be taken up by the Mop-Up Panel.

PFMC
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