

## **Report on the 2005 Stock Assessment Review (STAR 2005) of the Assessments of the Status of US West Coast Stocks of English Sole, Petrale Sole, and Starry Flounder**

By

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### **Executive Summary**

The STAR 2005 review of the Status of US West Coast Stocks of English sole, Petrale sole, and Starry flounder were conducted at the Northwest Fisheries Science Center (NWFSC), Seattle, WA, from April 18-22, 2005. The stock assessments reviewed were conducted by NWFSC and University of Washington stock assessment biologists, and were subject to a very open peer review process that identified the most likely sources of uncertainty. The review was complicated by the fact that all three assessments were based on a new version of the Stock Synthesis 2 software (SS2 version 1.18) that still were undergoing changes during the week prior to the review. Thus, neither the stock assessment teams (STAT) nor the review panel members were fully familiar with the software and model outputs. The Review Panel unanimously agreed that the assessments of English sole, Petrale sole (southern stock), and Starry flounder were based on the best available data. The assessments of English sole and Starry flounder suggested that these stocks are in healthy condition. Due to strong recent recruitments, the English sole stock was estimated at 90% of the virgin biomass, while the spawning stock of Starry flounder was well above the SB<sub>40%</sub> reference point. The assessment of the northern stock of Petrale sole was withdrawn from the current review to allow for the incorporation of additional age-composition data made available to the Stock Assessment team from Washington Department of Fish and Wildlife during the week of the review.

Furthermore, it was established during the meeting that about 1,500 otoliths from Petrale sole landed in Oregon can be read and made available during the next few months. The updated assessment of Petrale sole, incorporating the additional data on age-composition from recent year's landings, will be reviewed at a later STAR Panel.

## **1. Background**

This is a report on the STAR 2005 Stock Assessment Review Workshop for US West coast stocks of English sole, Petrale sole, and Starry flounder, held in Seattle, WA, at the NMFS Northwest Fisheries Science Center (NWFSC) from April 18-22, 2005. The STAR Panel's charge was to review draft stock assessment documents and other relevant information, work with the Stock Assessment Team to make necessary revisions, and produce STAR Panel reports for each stock to be used by the Council and other interested persons. This report presents my evaluation of the review process, and briefly summarizes the findings and recommendations, with focus on my experience as a reviewer on the panel. This report should be read in conjunction with the three reports on English sole, Petrale sole, and Starry flounder prepared by the review panel.

## **2. Description of review activities**

The STAR 2005 was chaired by David Sampson in an organized and effective manner. Ms. Stacey Miller (NWFSC) provided excellent support before and during the review meeting. Following introductions and review of the agenda and STAR Panel Terms of reference, Dr. Rick Methot (NWFSC) gave a very useful presentation of the Stock Synthesis 2 model and software used for the stock assessments reviewed. During the review meeting, each stock assessment was presented by the responsible assessment expert, and reviewed by the panel. Members of the Stock Assessment Team (STAT) went out of their way to fulfill analysis requests by the Review Panel and update stock assessments during the review, and is commended. The STAT team's ability to address a large number of requests for additional analysis while using a new Stock Synthesis

Software (SS2 version 1.18) that still were experiencing some glitches is particularly notable.

It was a pleasure to work with the review panel, whose members represented a broad area of expertise in fisheries, and included participants from the Groundfish Management Team and the Groundfish Advisory Subpanel:

**STAR Panel Members:**

David Sampson, STAR Chair and SSC representative, Oregon State University  
Robert Mohn, Center for Independent Experts  
Jon Volstad, Center for Independent Experts  
James Ianelli, NMFS, AFSC, Seattle, WA

**Groundfish Management Team Representatives:**

Michele Culver, Washington Department of Fisheries, Montesano, WA  
Brian Culver, Washington Department of Fisheries, Montesano, WA

**Groundfish Advisory Subpanel Representative:**

Peter Leipzig, Fishermen's Marketing Association, Eureka, CA

**Sock Assessment Team Members Present:**

Ian Stewart, NMFS, NWFSC, Seattle, WA (English sole)  
Stephen Ralston, NMFS, SWFSC, Santa Cruz, CA (Starry flounder)  
Han-Lin Lai, NMFS, NWFSC, Seattle, WA (Petrale sole, Northern Stock)  
Melissa Haltuch, University of Washington, Seattle, WA (Petrale sole, Southern stock)

### **3. Summary of findings**

Detailed reviews and future research recommendations for each stock assessment, as well as a description of the analyses requested by the panel during the STAR meeting are presented in the STAR Panel Reports and will not be repeated here. The meeting was collegial, and there were no major disagreements among STAR Panel members, or between the panel and the STAT team or other participants.

The high quality stock assessment for English sole, based on thorough data preparations and analysis, indicated that the stock is currently growing and could sustain larger removals than has been the case in recent years.

Although the panel accepted the assessment of the southern stock of Petrale sole to be based on best available data, the assessment of the northern stock of Petrale sole was withdrawn from the current review to allow for the incorporation of additional age-composition data. Age data spanning 1998-2005 were made available to the Stock Assessment team from the Washington Department of Fish and Wildlife during the week of the review, and clearly could not be incorporated into the assessment model in time for this current review. Furthermore, it was established that about 1,500 otoliths from petrale sole landed in Oregon can be read and would be made available during the next few months. The existence of recent age-data for northern Petrale sole not incorporated in the stock assessment indicates problems with the QA/QC process within the agency. It is surprising that these data were not identified in the data workshop prior to the stock assessment. The current STAR panel had several questions and recommendations for the STAT team to consider during the revision of the northern Petrale sole assessment. The updated assessment of Petrale sole, incorporating the additional data on age-composition from recent year's landings, will be reviewed at a later STAR Panel.

The STAT team is commended for innovative analysis, and the integration of fisheries-dependent data with available information from the literature to produce this first stock assessment for Starry flounder. Greater uncertainty in the stock assessments of starry

flounder than estimated by the SS2 model runs results from the dependence on fisheries-dependent indices of abundance, exaggerated by the limited information on the size and age composition of the catches. Improved monitoring of the stocks will require fisheries-independent survey indices of abundance, and adequate data on discards from all fishery segments. Nevertheless, the results indicate that the spawning biomass of both the southern and northern components of the stock is well above the SB<sub>40%</sub> reference point.

#### **4. Conclusions and recommendations**

Recommendations for future research are included in the individual STAR panel reports. All three assessments were based on the new Stock Synthesis 2 software (SS2, version 1.18). Although the SS2 program is a major improvement over prior versions, the 1.18 version was still undergoing significant changes while the stock assessments were being conducted, impeding the STAT team in their effort to complete the assessments before the review meeting. As a result, significant changes were made to the draft assessments provided to the panel prior to the STAR review meeting. This complicated the review process, and resulted in more analysis requests from the panel to the STAT team. The panel and the STAT teams had difficulties in interpreting some model results and diagnostics because they were not fully familiar with the new software, and because the current version has limitations with respect to the specification of future harvest in the projections. Future stock assessments and reviews should be much smoother as the SS2 software has been fully developed and tested, and the STAT teams have become fully familiar with its capabilities. It is my recommendation that, if feasible, the new software be tested based on prior data and assessments using the earlier version for comparison.

The review suggests that the center's QA/QC procedures to ensure the identification and use of best available data could be improved. A better collaboration between the state and federal agencies could potentially have made available the additional age-data for Petrale sole for use in the current stock assessment, for example.

It is my opinion that this STAR panel review meeting was somewhat premature as some assessments were incomplete at the start of the meeting. It appears that the STAT teams were working under unreasonable time pressure given that they were using the new Stock synthesis software that they were not fully familiar with for the assessments. Also, the coverage of three stock assessments during one review meeting is at or above the limit for a thorough review during one week.

## **Appendix A: Bibliography of Material Provided prior to STAR 2005 panel review workshop:**

### **Documents Provided:**

Documents provided to the consultants prior to the STAR Panel meeting included:

- Current drafts of the English sole, Petrale sole, and Starry flounder stock assessment reports;
- Most recent previous stock assessments for English sole (1993) and Petrale sole (1999) (Starry flounder has not been assessed previously);
- An electronic copy of the data, the parameters, and the model used for the assessments;
- The Terms of Reference for the Groundfish Stock Assessment and STAR Panel Process for 2005-2006;
- Summary reports from the West Coast Groundfish data and modeling workshops held in 2004;
- Stock Synthesis 2 (SS2) documentation
- Petrale Sole STAR Panel Meeting Report 1999

### **Additional Material Consulted:**

Improving Fish Stock Assessments. National Academy Press. Washington, DC, 1998.  
176 pp.

Methot, R.D. 2000. Technical description of the stock synthesis assessment program. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-43, 46 p.

## **Statement of Work**

### **Consulting Agreement Between the University of Miami and Versar, Inc.**

**March 7<sup>th</sup>, 2005**

#### **General**

External, independent review of West Coast groundfish stock assessments is an essential part of the STAR panel process. The stock assessments will provide the basis for the management of the English sole, Petrale sole, and Starry flounder resources off the U.S. Pacific coast.

The consultants will participate in the Stock Assessment and Review (STAR) Panel of the Pacific Fishery Management Council (PFMC) for the review of the English sole, Petrale sole, and Starry flounder stock assessments. The consultant should have expertise in fish population dynamics with experience in the integrated analysis type of modeling approach, using age-and size-structured models, use of MCMC to develop confidence intervals, and use of Generalized Linear Models to process survey and logbook data for use in assessment models.

Documents to be provided to the consultants prior to the STAR Panel meeting include:

- Current drafts of the English sole, Petrale sole, and Starry flounder stock assessment reports;
- Most recent previous stock assessments for English sole and Petrale sole (Starry flounder has not been assessed previously);
- An electronic copy of the data, the parameters, and the model used for the assessments (if requested by reviewer);
- The Terms of Reference for the Groundfish Stock Assessment and STAR Panel Process for 2005-2006;
- Summary reports from the West Coast Groundfish data and modeling workshops held in 2004;
- Stock Synthesis 2 (SS2) documentation; and
- Any additional supporting documents as available.

#### **Specific**

Consultant's duties should not exceed a maximum total of 14 days: several days prior to the meeting for document review; the 5-day meeting; and several days following the meeting to complete the written report. The report is to be based on the consultant's findings, and no consensus report shall be accepted.

The consultant's tasks consist of the following:

- 1) become familiar with the draft stock assessments and background materials.
- 2) Actively participate in the STAR Panel to be held in Seattle, Washington, from April 18-22, 2005.
- 3) Comment on the primary sources of uncertainty in the assessment.
- 4) Comment on the strengths and weaknesses of current approaches.
- 5) Recommend alternative model configurations or formulations as appropriate during the STAR panel.
- 6) Complete a final report after the completion of the STAR Panel meeting.
- 7) No later than May 6, 2005, submit a written report consisting of the findings, analysis, and conclusions (see Annex I for further details), addressed to the "University of Miami Independent System for Peer Review," and sent to Dr. David Die, via e-mail to [ddie@rsmas.miami.edu](mailto:ddie@rsmas.miami.edu), and to Mr. Manoj Shivilani, via e-mail to [mshivilani@rsmas.miami.edu](mailto:mshivilani@rsmas.miami.edu).

## **ANNEX 1: Contents of Panelist Report**

1. The report shall be prefaced with an executive summary of findings and/or recommendations.
2. The main body of the report shall consist of a background, description of review activities, summary of findings (including answers to the questions in this statement of work), and conclusions/recommendations.
3. The report shall also include as separate appendices the bibliography of all materials provided by the Center for Independent Experts and a copy of the statement of work.