

SCIENTIFIC AND STATISTICAL REPORT ON STOCK ASSESSMENTS AND REBUILDING ANALYSES FOR 2007-2008 GROUND FISH FISHERIES

Stock assessments for Petrale sole, lingcod, and canary rockfish were carried over to the September wrap-up Stock Assessment Review (STAR) Panel, which also reviewed rebuilding analyses for the seven overfished species. The September STAR Panel consisted of six members of the Scientific and Statistical Committee (SSC) groundfish subcommittee, one stock assessment scientist from the Southwest Fisheries Science Center (SWFSC) and one committee of independent experts reviewer. Revised stock assessments for all three species were reviewed and approved by the STAR Panel. The STAR Panel report was presented to the SSC by Dr. Martin Dorn, who chaired the STAR Panel.

Petrале Sole

The northern petrale sole stock assessment, originally scheduled for review at the April STAR Panel, was withdrawn because age composition data for recent years arrived during the review. Final review of both northern and southern petrale stock assessments were deferred to the September wrap-up STAR Panel.

The SSC reviewed the revised stock assessment and STAR Panel reports for both southern and northern petrale stocks (Agenda Item H.2.a, Attachment 2). The Stock Assessment Team (STAT) identified a number of issues with the northern stock concerning the modeling of multiple fisheries with dome-shaped selectivity patterns using sex-specific age data from different agencies. The model performed erratically and the complexity of the model made it difficult to interpret the results. To resolve these issues, the STAR Panel recommended that a radically simplified model, with all fisheries having the same asymptotic selectivity and with the sexes combined, be used. The simple model fit the data almost as well as the more complex model, giving very similar biomass trends.

Model results indicate that both stocks were above the overfishing threshold; Petrale sole in the north was estimated to be at 34% of unfished spawning biomass in 2005, and at 29% of unfished spawning biomass in the south. Biomass trends were quantitatively similar in both areas and the SSC recommends that a single coastwide assessment be considered in future stock assessments if issues with data patchiness can be resolved.

The current stock assessment presents a very different picture of stock trends over time in the north compared to the previous assessment. For example, in the 1999 stock assessment, spawning stock biomass in 1998, was estimated to be 39% of B_0 , while the current assessment now estimates that the 1998 spawning biomass was 12% of B_0 . The reason for these differences is unclear, but the SSC notes that there were many changes to the model and the catch data that may account for these results. The stock appears to have recovered from this very low level of abundance despite a long period of relatively stable catches.

The SSC endorses the STAR Panel conclusions that this assessment represents the best available science and can form the basis for Council decision-making.

Lingcod

Lingcod was first reviewed at the August STAR Panel meeting but was not approved largely because of uncertainty concerning the strength of the 1999 and 2000 year classes that were strongly influencing the perception of stock recovery. The STAT examined the evidence for these strong year classes and presented their findings at the September STAR Panel meeting.

The STAR panel found that the commercial age composition in 2001 and 2004, and the survey biomass estimates in 2001 and 2004 provided some support for above average year classes in 1999 and 2000, but the magnitude of these increases was uncertain. Data from the recreational fishery did not provide support for above average 1999 and 2000 year classes. However, sensitivity runs in which year class strength for 1999 and 2000 was set to the long term mean still showed the Lingcod-North (LCN) stock rebuilding, a result of the much higher productivity of lingcod compared to other groundfish stocks, and because of the substantial catch reductions in the northern area in recent years. In contrast, the southern stock has been rebuilding more slowly due to smaller reductions in catches and lower recruitment in recent years.

Estimated spawning stock biomass is 87% of unfished for the northern component of the stock and 24% of unfished for the southern component. The coastwide spawning stock biomass is estimated to be 64% of unfished biomass in 2005. Since the Council currently manages lingcod as a single coastwide stock, the stock is considered rebuilt. However, the SSC notes that the large disparity in spawning biomass between the north and south components, combined with different biological parameters suggest that there is some basis for managing lingcod on a regional basis.

The SSC endorses the STAR Panel conclusions that this stock assessment represents the best available science and can form the basis for Council decision making.

Canary Rockfish

At its September meeting, the SSC raised several technical issues with the canary rockfish assessment, and recommended that the canary assessment be revisited by the September STAR Panel. Specifically, the SSC requested that the STAT address the following four issues:

1. Survey catchability (q) was unusually high.
2. Assumed variability in the spawner-recruit relationship was low compared to other rockfish.
3. More complete documentation should be provided.
4. Inclusion of the Santa Cruz juvenile rockfish survey data should be considered.

The STAT complied with these requests and presented their findings at the September STAR Panel meeting. Comparing the survey q for canary with values estimated for other rockfish, it was determined that the q estimated for canary was larger than that estimated in other 2005 shelf rockfish assessments. Although the relatively high q estimate may be inconsistent with what is known of canary habitat (they are found in areas of high relief and complex substrate), this did

not constitute sufficient evidence to reject the assessment. The SSC recommends further investigation of this matter in the next canary assessment.

The STAR Panel also noted that recruitment variability (σ_r) used in this and the previous canary stock assessment was the lowest of any rockfish, although there are other rockfish at or near the value used for canary (fixed at 0.4). However, the value of σ_r output by the assessment model was even lower (0.29), driven largely by the age data, which showed remarkable consistency over time, suggesting very stable recruitment. Furthermore, it was noted that age data are considered more reliable for canary than for most other rockfish.

The STAT also explored the effect of including the Santa Cruz juvenile survey data and the STAR Panel concluded that this could be influential depending on how the survey data are modeled. Modeling as in the widow rockfish assessment resulted in higher recent recruitments and higher estimated spawner-recruit steepness, but there are technical issues with incorporating these kinds of data that were identified by the widow STAR Panel. In addition, it was noted that the juvenile survey is at the southern end of the range of canary and may not provide a good index of recruitment. The STAR Panel consensus was that exclusion of the juvenile survey data was not sufficient to reject the assessment.

The STAR Panel concluded that the variability around a single base model underestimated overall uncertainty. The STAT recommended, and the STAR Panel concurred, that an alternate model be run in which male and female length-based selectivity was the same (“no-diff” model). Both the “no diff” and the original model accepted by the August STAR Panel (“diff”) were considered equally likely. Profiles on steepness were conducted for the two models which were then blended with equal weighting to capture more of the statistical uncertainty. These results were carried forward into the rebuilding analysis.

The SSC endorses the STAR Panel conclusions that this stock assessment represents the best available science and can form the basis for Council decision making.

Rebuilding Analyses

Rebuilding analyses were reviewed for all overfished stocks according to guidelines and standards that were in effect when the rebuilding analyses were conducted. Currently it is uncertain how the recent court ruling on darkblotched rockfish will impact rebuilding targets, but it appears that current rebuilding targets and time frames may not be consistent with the court ruling. Nevertheless, the SSC reviewed the current rebuilding analyses for consistency with previously established guidelines and notes that these analyses still provide important guidance on stock recovery and effectiveness of Council management actions to recover overfished stocks.

There are seven overfished stocks for which rebuilding analyses were conducted. A rebuilding analysis was not conducted for lingcod because this stock is now estimated to be above the $B_{40\%}$ recovery target (coastwide spawning biomass is estimated to be 64% of unfished). The overfished stocks are: bocaccio, canary, cowcod, darkblotched, Pacific Ocean perch, widow, and yelloweye. Of these, canary, cowcod, darkblotched, POP, and widow are rebuilding ahead of schedule. Progress is barely adequate for bocaccio, while yelloweye rebuilding is behind

schedule. The SSC notes that it will be increasingly difficult to evaluate progress toward rebuilding for yelloweye because this species is not sampled by the survey and there is no fishery data being generated.

Six runs were requested of each STAT to evaluate rebuilding. These runs and the results for each overfished species are presented in the STAR Panel report, Rebuilding Analyses for Overfished Groundfish Stocks (Agenda Item H.2.a, Attachment 8). Agenda Item H.3.a, Supplemental Attachment 2 also summarizes rebuilding progress for each of the overfished stocks. The SSC notes, however, that this table contains some errors and should be corrected according to the STAR Panel report before use by the Council. A corrected table is appended to this report.

The SSC reviewed the rebuilding analyses for each overfished stock and endorses the STAR Panel conclusion that these rebuilding analyses represent the best available science and can provide the basis for evaluating progress towards rebuilding given the guidelines that were in effect at the time the analyses were conducted. The SSC notes that the rebuilding tool developed and used in the current rebuilding projections can be used to evaluate other management alternatives and targets.

PFMC
11/01/05

Summary of Stock Status Updates for Overfished Groundfish Species in the PFMC Area 1/

Species	Status Change	Target Rebuilding Year in the FMP	Previous Rebuilding Parameters			Updated Rebuilding Parameters				Comments/Implications
			Tmin	Tmax	Pmax	Tmin	Tmax	Pmax 2/	Ptarget 3/	
Lingcod	Rebuilt	2009	2004 N 2005 S	2009	60%	NA	NA	NA	NA	Coastwide biomass estimated to be B64%
POP	No signif. change	2026	2014	2042	70%	2015	2043	78.9%	59.7%	
Darkblotched	Much better	2030	2011	2044	>90%	2009.5	2033	97.2%	96.2%	
Yelloweye	Worse	2058	2027	2071	92%	2036	2080	0.3%	0%	Reduce harvest rate to get to \geq 50% Pmax
Canary	Slightly better	2074	2057	2076	60%	2048	2071	55.4%	57.4%	FMP amendment required 4/
Widow	Much better	2038	2026	2042	60%	2013	2033	94.0%	96.3%	FMP amendment required 4/
Cowcod	Better	2090	2062	2099	60%	2035	2074	75.0%	82.0%	FMP amendment required 4/
Bocaccio	No signif. change	2023 5/	2018	2032	70%	2018	2032	67.8%	24.0%	FMP amendment required 4/

1/ Assuming the SSC endorses and the Council approves the 2005 assessments and rebuilding analyses for these species.

2/ Probability of rebuilding under the re-estimated Tmax assuming no change in harvest rate.

3/ Probability of rebuilding by the target year in the FMP assuming no change in harvest rate.

4/ Implied action is to change the target rebuilding year according to the tenets of the Pacific Coast Groundfish FMP. For canary, widow, and cowcod, this is because the target year in the FMP is outside the range of the re-estimated Tmin to Tmax. For bocaccio, the target year was originally mis-specified (see footnote #5).

5/ The target year was incorrectly specified as 2023. The actual year in accordance with the Council-specified harvest rate and Pmax should have been 2027.