

10. Assessment of the Northern Rockfish stock in the Gulf of Alaska

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Executive Summary

Rockfish are assessed on a biennial stock assessment schedule to coincide with the availability of new survey data. For Gulf of Alaska rockfish in alternate (even) years we present an executive summary to recommend harvest levels for the next two years. Please refer to last year's full stock assessment report for further information regarding the assessment model (Hulson et al., 2011, available online at <http://www.afsc.noaa.gov/REFM/docs/2011/GOAnorthern.pdf>). A full stock assessment document with updated assessment and projection model results will be presented in next year's SAFE report.

We use a statistical age-structured model as the primary assessment tool for Gulf of Alaska northern rockfish stock which qualifies as a Tier 3 stock. For an off-cycle year, we do not re-run the assessment model, but do update the projection model with new catch information. This incorporates the most current catch information without re-estimating model parameters and biological reference points.

Summary of changes in Assessment Inputs

Changes in the input data: There were no changes made to the assessment model inputs since this was an off-cycle year. New data added to the projection model included an updated 2011 catch and new estimated catches for 2012-2014.

Changes in assessment methodology: There were no changes in assessment methodology since this was an off-cycle year.

Summary of Results

New estimates for this year's projection model are an updated 2011 catch at 3,440 t, and new estimated 2012-2014 catches. The 2012 catch was estimated by multiplying the official catch as of October 1, 2012, by an expansion factor of 1.051, which represents the average fraction of catch taken between October 1 and December 31 in the last three complete years (2009-2011). To estimate future catch, we updated the yield ratio of catch to ABC (0.79) using the average of the ratios for the last three complete years (2009-2011). This updated yield ratio was multiplied by the projected ABCs for 2013 and 2014 from the 2011 assessment model to estimate catches for those years. The new estimated catches for 2012-2014 are 5,253 t, 4,089 t, and 3,852 t, respectively. The updated yield ratio was lower than last year's yield ratio of 0.85 and the expansion factor was also lower than last year's expansion factor of 1.07.

For the 2013 fishery, we recommend the maximum allowable ABC of 5,132 t from the updated projection model. This ABC is 7% smaller than last year's ABC of 5,509 t but only 0.5% less than last year's 2013 projected ABC of 5,155 t. Recommended area apportionments of ABC are 2,008 t for the Western area, 3,122 t for the Central area, and 2 t for the Eastern area. The 2013 Gulf-wide OFL for northern rockfish is 6,124 t.

Reference values for northern rockfish are summarized in the following table, with the recommended ABC and OFL values in bold. The stock was not being subjected to overfishing last year, is not currently overfished, nor is it approaching a condition of being overfished.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2012	2013	2013	2014
<i>M</i> (natural mortality rate)	0.06	0.06	0.06	0.06
Tier	3a	3a	3a	3a
Projected total (ages 2+) biomass (t)	104,155	99,449	99,089	95,690
Female spawning biomass (t)				
Projected	43,414	40,589	40,452	37,935
<i>B</i> _{100%}	72,983	72,983	72,983	72,983
<i>B</i> _{40%}	29,193	29,193	29,193	29,193
<i>B</i> _{35%}	25,544	25,544	25,544	25,544
<i>F</i> _{OFL}	0.074	0.074	0.074	0.074
<i>maxF</i> _{ABC}	0.062	0.062	0.062	0.062
<i>F</i> _{ABC}	0.062	0.062	0.062	0.062
OFL (t)	6,574	6,152	6,124	5,791
maxABC (t)	5,509	5,155	5,132	4,852
ABC (t)	5,509	5,155	5,132	4,852
Status	As determined last year for:		As determined this year for:	
	2010	2011	2011	2012
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Updated catch data (t) for northern rockfish in the Gulf of Alaska as of October 1, 2012 (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org>) are summarized in the following table.

Year	Western	Central	Eastern	Gulfwide Total	Gulfwide ABC	Gulfwide TAC
2011	1,742	1,698		3,440	4,854	4,854
2012	1,816	3,181		4,997	5,507	5,507

Area Apportionment

The apportionment percentages are the same as in the 2011 full assessment. The following table shows the recommended apportionment for 2013. Please refer to last year's full stock assessment report for information regarding the apportionment rationale for northern rockfish.

	Western	Central	Eastern*	Total
Area Apportionment	39.13%	60.83%	0.04%	100%
Area ABC (t)	2,008	3,122	2	5,132
OFL (t)				6,124

*For management purposes the small ABC in the Eastern area is combined with other rockfish.

Summaries for Plan Team

Species	Year	Biomass ¹	OFL	ABC	TAC	Catch ²
Northern rockfish	2011	108,298	5,784	4,854	4,854	3,440
	2012	104,155	6,574	5,507	5,507	4,997
	2013	99,089	6,124	5,132		
	2014	95,690	5,791	4,852		

Stock/ Assemblage	Area ³	2012				2013		2014	
		OFL	ABC	TAC	Catch ²	OFL	ABC	OFL	ABC
Northern rockfish	W		2,156	2,156	1,816		2,008		1,899
	C		3,351	3,351	3,181		3,122		2,951
	E						2		2
	Total		6,574	5,507	5,507	4,997	6,124	5,132	5,791

¹Total biomass (ages 2+) from the age-structured model

²Current as of October 1, 2012. Source: NMFS Alaska Regional Office Catch Accounting System via the AKFIN database (<http://www.akfin.org>).

³For management purposes, the small ABC for northern rockfish in the Eastern Gulf of Alaska is combined with other rockfish. Thus, for 2012 this value is not reported in this table, but 2013 and 2014 are included as future recommendations.

SSC and Plan Team Comments on Assessments in General

“The SSC is pleased to see that many assessment authors have examined retrospective bias in the assessment and encourages the authors and Plan Teams to determine guidelines for how to best evaluate and present retrospective patterns associated with estimates of biomass and recruitment. We recommend that all assessment authors (Tier 3 and higher) bring retrospective analyses forward in next year’s assessments.” (SSC, December 2011)

“The SSC concurs with the Plan Teams’ recommendation that the authors consider issues for sablefish where there may be overlap between the catch-in-areas and halibut fishery incidental catch estimation (HFICE) estimates. In general, for all species, it would be good to understand the unaccounted for catches and the degree of overlap between the CAS and HFICE estimates, and to discuss these at the Plan Team meetings next September.” (SSC, December 2011)

“The Teams recommend that authors continue to include other removals in an appendix for 2013. Authors may apply those removals in estimating ABC and OFL; however, if this is done, results based on the approach used in the previous assessment must also be presented. The Teams recommend that the “other” removals data set continue to be compiled, and expanded to include all sources of removal.” (Plan Team, September 2012)

“For the November 2012 SAFE report, the Teams recommend that authors conduct a retrospective analysis back 10 years (thus, back to 2002 for the 2012 assessments), and show the patterns for spawning biomass (both the time series of estimates and the time series of proportional changes relative to the 2012 run). This is consistent with a December 2011 NPFMC SSC request for stock assessment authors to conduct a retrospective analysis. The base model used for the retrospective analysis should be the author’s recommended model, even if it differs from the accepted model from previous years.” (Plan Team, September 2012)

SSC and Plan Team Comments Specific to this Assessment

“The Team asks the [rockfish] authors to investigate whether the conversion matrix has changed over time. Additionally, the Team requests that the criteria for omitting data in stock assessment models be based upon the quality of the data (e.g. bias, sampling methods, information content, redundancy with other data, etc.) rather than the effect of the data on modeled quantities.” (Plan Team, November 2011)

“The SSC also looks forward to an update of weight-at-age, length and age transition matrices, ageing error matrix, and length bins for fishery length compositions during the next assessment cycle.” (SSC, December 2011)

“The SSC supports the inclusion of the maturity data within the model to estimate an intermediate maturity schedule as an interim solution to dealing with two conflicting studies. However, we encourage the authors to further explore the reasons for differences seen between the two studies of maturity that formed the basis of the estimated maturity schedule in the model.” (SSC, December 2011)

Responses to Comments and Research Priorities for Full Assessment

Responses to the previously listed SSC and Plan Team Comments will be provided in next year’s full stock assessment report. To address several of these comments, we plan to follow the recommendations listed in the various working group reports (e.g. the retrospective analysis report) submitted to the Plan Team in September 2012 and will be updating the various input data requested by the SSC. Further investigations into maturity of northern rockfish will also be continued for potential incorporation into future assessments. In addition, we anticipate that many of the comments specific to the northern rockfish assessment will be considered in the upcoming 2013 Center for Independent Experts (CIE) Alaska rockfish scientific peer review. Evaluation of assessment methods to estimate model parameters, uncertainty, and projections as well as recommendations or prioritizations for future research to improve the assessments will likely be part of this process.