

6. Assessment of the Rex Sole Stock in the Gulf of Alaska (Executive Summary)

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6.1 Introduction

In 2006, the Gulf of Alaska rex sole (*Glyptocephalus zachirus*) stock was moved to a biennial stock assessment schedule to coincide with the expected receipt of new survey data. A discussion at the September 2006 Groundfish Plan Team meetings concluded the following two important points for updating information in off-year assessments:

- 1) Anytime the assessment model is re-run and presented in the SAFE Report, a full assessment document **must** be produced.
- 2) The single-species projection model **may** be re-run using new catch data without re-running the assessment model.

Thus, on alternate (even) years, parameter values from the previous year's assessment model and total catch information for the current and previous year are used to make projections via the single species projection model for the following two years and to recommend ABC levels for those years.

Because no new survey data was available this year, option 2 above was followed to update information for 2010. Thus, the single species projection model was run using parameter values from the base case 2009 assessment model, together with updated catch information for 2009 and 2010, to predict stock status for rex sole in 2011 and 2012 and to make ABC recommendations for those years. The 2009 assessment model is documented in Stockhausen et al. 2009¹.

6.2 Updated catch and projection

New information available to update the projection model consists of the total catch for 2009 (4,753 t) and the current catch for 2010 (3,034 t as of Sept. 25, 2010). The recommended ABC and OFL from last year's assessment were based on Tier 5 calculations applied to the assessment model estimates of adult biomass, because estimates for $F_{35\%}$, $F_{40\%}$ and $B_{40\%}$ were not considered reliable. The same Tier 5 approach based on adult biomass estimated using the projection model was used here. The projection model was run to generate estimates of total (age 3+) biomass for 2010-2012. In order to do this, estimates for the total catches to be taken in 2010 and 2011 were required. The final catch for 2010 was estimated by dividing the current catch by the ratio of the catch in the same week in 2009 as the current catch (week 39) to the final 2009 catch. The estimated final catch for 2010 (3,866 t) was also used as the estimate for the final 2011 catch. The resulting estimates of total biomass (2011-2012) were converted to adult biomass using a conversion factor determined from the 2009 assessment model. ABC and OFL for 2011 and 2012 were then calculated based on Tier 5 specifications for F_{OFL} (=M) and max F_{ABC} (=0.75M) using estimates of adult biomass at the start of each year, $M=0.17$, and the Baranov catch equation. The recommended ABC's for 2011 and 2012 are 9,565 t and 9,396 t, respectively, while the OFL's are 12,499 t for 2011 and 12,279 t for 2012. The new OFL and recommended ABC values for 2011 are nearly identical to those adopted for 2011 using last year's full assessment model (12,534 t and 9,592 t, respectively). The principal reference values for this update and from last year's assessment are summarized in the following table, with the recommended values for 2011 in bold:

¹Stockhausen, W., M. Wilkins and M. Martin. 2009. 6. Assessment of the Rex Sole Stock in the Gulf of Alaska. In: Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. North Pacific Fishery Management Council, PO Box 103136, Anchorage, AK. <http://www.afsc.noaa.gov/REFM/docs/2009/GOArex.pdf>.

Quantity/Status	Last year (2009 Assessment)		This year (2010 Update)	
	2010	2011	2011	2012
M (natural mortality)	0.17	0.17	0.17	0.17
Specified/recommended tier	5	5	5	5
Biomass (adult; t)	88,221	86,974	86,729	85,203
$F_{OFL} (= M)$	0.170	0.170	0.170	0.170
$max F_{ABC} (= 0.75 \times F_{OFL})$	0.128	0.128	0.128	0.128
<i>recommended</i> F_{ABC}	0.128	0.128	0.128	0.128
Specified/recommended OFL (t)	12,714	12,534	12,499	12,279
Specified/recommended ABC (t)	9,729	9,592	9,565	9,396
Is the stock being subjected to overfishing?	no	no	no	no

6.3 Area Apportionment

The area apportionments are based on the distribution of biomass from the most recent survey (in this case the 2009 GOA bottom trawl survey). The recommended area apportionment percentages are identical to last year because there is no new survey information. The following table shows the recommended ABC area apportionment for 2011-2012:

	West		Southeast		Total
	Western	Central	Yakutat	Outside	
Area Apportionment	15.9%	65.8%	9.1%	9.3%	100.0%
2011 ABC (t)	1,517	6,294	868	886	9,565
2012 ABC (t)	1,490	6,184	853	869	9,396

6.4 Research Priorities

The rex sole fishery is, at present, primarily a bycatch fishery that takes mainly older, larger fish. As a consequence, current estimates of optimum harvest levels based on Tier 3 calculations (e.g., at F_{ABC} harvest rates) are very large but highly uncertain. The rex sole fishery should continue to be monitored to assess whether a directed rex sole fishery has developed because quantities such as F_{ABC} will be sensitive to the characteristics of the resulting fishery selectivity curves. Monitoring fishery size and age compositions will be crucial.

6.5 Summaries for Plan Team

Species	Year	Adult Biomass ¹	OFL ²	ABC ²	TAC ²	Catch ³
Rex sole	2009	81,572	11,756	8,996	8,996	4,753
	2010	88,221	12,714	9,729	9,729	3,034
	2011	86,729	12,499	9,565		
	2012	85,203	12,279	9,396		

¹Adult biomass from the 2009 SAFE Summary (2009-2010) or updated projection model (2011-2012).

²As published in the Federal Register (2009-2010) or as recommended based on Tier 5 calculations using adult biomass from the projection model (2011, 2012).

³As of Sept. 25, 2010.

Stock/ Assemblage	Area	2010				2011		2012	
		OFL ¹	ABC ¹	TAC ¹	Catch ²	OFL ³	ABC ³	OFL ³	ABC ³
Rex sole	W	--	1,543	1,543	100	--	1,517	--	1,490
	C	--	6,403	6,403	2,932	--	6,294	--	6,184
	WYAK	--	883	883	2	--	868	--	853
	SEO	--	900	900	0	--	886	--	869
	Total	12,714	9,729	9,729	3,034	12,499	9,565	12,279	9,396

¹As published in the February 2010 Federal Register. ²As of Sept. 25, 2010.

Values published in the Federal Register are available through the following links:

2009: http://www.fakr.noaa.gov/sustainablefisheries/specs09_10/goatable1.pdf

2010: http://www.fakr.noaa.gov/sustainablefisheries/specs10_11/goatable1.pdf

2011: http://www.fakr.noaa.gov/sustainablefisheries/specs10_11/goatable2.pdf

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