5. Assessment of the Deepwater Flatfish Stock in the Gulf of Alaska (Executive Summary)

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5.1 Introduction

In 2006, the deepwater flatfish complex (consisting of Dover sole, Greenland turbot and deepsea sole) has been moved to a biennial stock assessment schedule to coincide with 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 for species in Tier 3 or higher:

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.

Greenland turbot and deepsea sole fall under Tier 6. Because species-level ABC's and OFL's for Tier 6 species are based on historical catch levels, these quantities cannot be updated. Consequently, as in previous years (Stockhausen et al. 2007[1]), ABC is 179 t for Greenland turbot and OFL is 238 t while for deepsea sole ABC is 4 t and OFL is 6 t for both 2009 and 2010. Dover sole, however, is in Tier 3 and is assessed using an age-structured model. Because no new survey data was available this year, option 2 above was followed to update information for Dover sole for 2008. Thus, the single species projection model was run using parameter values from the accepted 2007 assessment model (Stockhausen et al. 2007[1]), together with updated catch information for 2007 and 2008, to predict stock status for Dover sole in 2009 and 2010 and to make ABC recommendations for those years.

5.2 Updated catch and projection

New information available to update the Dover sole projection model consists of the total catch for 2007 (278 t) and the current catch for 2008 (539 t as of Sept. 20, 2008). To run the projection model to predict ABC's for 2009 and 2010, estimates are required for the total catches in 2008 and 2009. Because the current catch of Dover sole (539 t) is the largest in recent years, it was used as a "best" estimate of the total catches taken in 2008 and 2009. Based on the updated projection model results, the recommended ABC's for 2009 and 2010 are 8,985 t and 9,610 t, respectively. The new ABC recommendation for 2009 is similar to that recommended for 2009 using last year's full assessment model (8,989 t). The principal reference values are shown in the following table, with the recommended values in bold:

[1]Stockhausen, W., M. Wilkins and M. Martin. 2007. 5. Gulf of Alaska Deepwater Flatfish. 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/2007/GOAdeepflat.pdf.

	Last year's projection-not updated		This year's projection-updated	
	2008	2009	**2009***	2010
$B_{40\%}$ (t)	21,077	21,077	21,077	21,077
Female Spawning Biomass (t)	43,284	44,560	44,540	46,095
F_{ABC} (maximum allowable= $F_{40\%}$)	0.137	0.137	**0.137**	0.137
F_{OFL} ($F_{35\%}$)	0.176	0.176	**0.176**	0.176
ABC (t)	8,720	8,989	**8,985**	9,610
OFL (t)	10,999	11,339	**11,334**	12,123

5.3 Area Apportionment

The recommended apportionment percentages are identical to last year, because there is no new survey information. The following table shows the recommended apportionments for 2009-10:

Quantity	Species	Western Gulf	Central Gulf	West Yakutat	Southeast Outside	Total
Area apportionment	Dover sole	6.5%	76.6%	11.0%	5.9%	100.0%
	Greenland turbot	68.2%	22.3%	5.0%	4.5%	100.0%
	Deepsea sole	0.0%	100.0%	0.0%	0.0%	100.0%
2009 ABC (t)	Dover sole	584	6,883	988	530	8,985
	Greenland turbot	122	40	9	8	179
	Deepsea sole	0	4	0	0	4
	Total	706	6,927	997	538	9,168
2010 ABC (t)	Dover sole	625	7,361	1,057	567	9,610
	Greenland turbot	122	40	9	8	179
	Deepsea sole	0	4	0	0	4
	Total	747	7,405	1,066	575	9,793

5.4 Research Priorities

The use of alternative selectivity functions in the assessment model is an area of active research. Data from the groundfish survey suggests that Dover sole in the path of the survey trawl exhibit a probability of capture that declines at larger sizes, rather than increasing to reach an asymptote as is generally assumed. Differences in depth coverage among the groundfish surveys used in the assessment add a further complication to the use of "standard" selectivity curves such as the logistic.

The assessment model is also being revised to incorporate length-based approaches to fishery and survey selectivity. The utility of potential environmental predictors of recruitment or catchability (e.g., temperature) are also being investigated.

5.5 Summaries for Plan Team

Species	Year	Biomass[1]	OFL[2]	ABC[2]	TAC[2]	Catch[3]
Deepwater flatfish complex	2007	131,720	10,431	8,707	8,707	278
	2008	132,625	11,343	8,903	8,903	541
	2009	133,025	11,578	9,168	--	--
	2010	133,360	12,367	9,793	--	--

[1]Age 3+ biomass for Dover sole (only) from the age-structured model (2007-2008) or the updated projection model (2009-2010). Biomass estimates for Greenland turbot and deepsea sole are considered

unreliable. [2]As published in the Federal Register (2007, 2008 for the deepwater flatfish complex) or as recommended based on the projection model (2009, 2010). [3]As of Sept. 20, 2008.

Stock/ Assemblage	Area	2008 OFL[1]	2008 ABC[1]	2008 TAC[1]	2008 Catch[2]	2009 OFL	2009 ABC	2010 OFL	2010 ABC
Deepwater flafish complex	W	–	690	690	11	--	706	--	747
	C	–	6,721	6,721	525	--	6,927	--	7,405
	WYAK	–	965	965	1	--	997	--	1,066
	SEO	–	527	527	4	--	538	--	575
	Total	11,343	8,903	8,903	541	11,578	9,168	12,367	9,793

[1]As published in the Federal Register for the deepwater flatfish complex. [2]Catch for the deepwater flatfish complex, as of Sept. 20, 2008.
Note: Values published in the Federal Register are available for:
2007: http://www.fakr.noaa.gov/sustainablefisheries/specs07_08/goatable1.pdf
2008: http://www.fakr.noaa.gov/sustainablefisheries/specs08_09/goatable1.pdf
2009: http://www.fakr.noaa.gov/sustainablefisheries/specs08_09/goatable2.pdf

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