GOA Rex Sole (update)

Carey McGilliard

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2014	2015	2015*	2016*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	5	5	5	5
Projected total (3+) biomass (t)	84,702	83,012	82,972	81,414
Female spawning biomass (t)	53,164	52,807	49,804	48,554
$B_{100\%}$	55,393	55,393	55,393	55,393
$B_{40\%}$	22,159	22,159	22,159	22,159
$B_{35\%}$	19,434	19,434	19,434	19,434
$F_{OFL}=M$	0.170	0.170	0.17	0.17
$maxF_{ABC}=0.75*M$	0.128	0.128	0.128	0.128
F_{ABC}	0.128	0.128	0.128	0.128
OFL (t)	12,207	11,963	11,957	11,733
maxABC (t)	9,341	9,155	9,150	8,979
ABC (t)	9,341	9,155	9,150	8,979

Status	As determined in 2013 for:		As determined in 2014 for:	
	2012	2013	2013	2014
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no

Area Apportionment

Quantity	Western	Central	West Yakutat	Southeast	Total
Area Apportionment	13.74%	63.57%	8.44%	14.25%	100.00%
2015 ABC (t)	1,258	5,816	772	1,304	9,150
2016 ABC (t)	1,234	5,707	758	1,280	8,979

Summary Information

Year	Biomass[1]	OFL[2]	ABC[2]	TAC[2]	Catch[3]
2013	86,684	12,492	9,560	9,560	3,707
2014	84,702	12,207	9,341	9,341	3,474
2015	82,972	11,957	9,150		
2016	81,414	11,733	8,979		

More Summary Information

Area	2014				2015		2016	
	OFL[1]	ABC[1]	TAC[1]	Catch[3]	OFL[2]	ABC[2]	OFL[2]	ABC[2]
W	--	1,270	1,270	110	--	1,258	--	1,234
C	--	6,231	6,231	3,363	--	5,816	--	5,707
WYAK	--	813	813	1	--	772	--	758
SE	--	1,027	1,027	0	--	1,304	--	1,280
Total	12,207	9,341	9,341	3,474	11,957	9,150	11,733	8,979

Data Gaps and Research Priorities

- Move assessment to Stock Synthesis for further exploration
- Explore survey and fishery selectivity patterns
- Estimate growth internally and based on more recent data, if possible
- Consider using ADF&G small mesh survey data
- Explore stock-recruit curves
- Account for ageing error
- Explore data weighting
- Explore ways to better account for uncertainty (e.g. uncertainty in natural mortality and catchability)

GOA Deepwater Flatfish Complex (update)

Carey McGilliard

Species	Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
		2014	2015	2015	2016
Dover sole	M (natural mortality rate)	0.085	0.085	0.085	0.085
	Tier	3a	3a	3a	3a
	Projected total (3+) biomass (t)	182,727	181,781	182,160	181,691
	Female spawning biomass (t)				
	Projected				
	Upper 95% confidence interval	66,181	67,078	67,233	68,022
	Point estimate	66,147	67,001	67,156	67,868
	Lower 95% confidence interval	66,126	66,945	67,100	67,752
	$B_{100\%}$	70,544	70,544	70,544	70,544
	$B_{40\%}$	28,218	28,218	28,218	28,218
	$B_{35\%}$	24,690	24,690	24,690	24,690
	F_{OFL}	0.12	0.12	0.12	0.12
	$maxF_{ABC}$	0.1	0.1	0.1	0.1
	F_{ABC}	0.1	0.1	0.1	0.1
	OFL (t)	15,915	15,711	15,749	15,559
	maxABC (t)	13,289	13,120	13,151	12,994
	ABC (t)	13,289	13,120	13,151	12,994

Species	Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
		2014	2015	2015	2016
Greenland turbot	Tier	6	6	6	6
	OFL (t)	238	238	238	238
	maxABC (t)	179	179	179	179
	ABC (t)	179	179	179	179
Deepsea sole	Tier	6	6	6	6
	OFL (t)	6	6	6	6
	maxABC (t)	4	4	4	4
	ABC (t)	4	4	4	4
Deepwater Flatfish Complex	OFL (t)	16,159	15,955	15,993	15,803
	maxABC (t)	13,472	13,303	13,334	13,177
	ABC (t)	13,472	13,303	13,334	13,177
	Status	As determined in 2013 for:		As determined in 2014 for:	
		2012	2013	2013	2014
	Overfishing	no	n/a	no	n/a
	Overfished	n/a	no	n/a	no
	Approaching overfished	n/a	no	n/a	no

Area Apportionment

Quantity	Species	Western	West Central	Yakutat	Southeast	Total
Area Apportionment	Dover sole	1.18%	28.02%	41.54%	29.26%	100.00%
	Greenland turbot	81.17%	0.00%	6.40%	12.43%	100.00%
	Deepsea sole	0.00%	100.00%	0.00%	0.00%	100.00%
2015 ABC (t)	Dover sole	156	3,684	5,463	3,848	13,151
	Greenland turbot	145	0	11	22	179
	Deepsea sole	0	4	0	0	4
	Deepwater Flatfish	301	3,688	5,474	3,870	13,334
2016 ABC (t)	Dover sole	154	3,640	5,398	3,802	12,994
	Greenland turbot	145	0	11	22	179
	Deepsea sole	0	4	0	0	4
	Deepwater Flatfish	299	3,644	5,409	3,824	13,177

Summary Information

Year	Biomass[1]	OFL[2]	ABC[2]	TAC[2]	Catch[3]
2013	173,853	6,834	5,126	5,126	242
2014	182,727	16,159	13,472	13,472	338
2015	182,160	15,993	13,334		
2016	181,691	15,803	13,177		

More Summary Information

Area	2014				2015		2016	
	OFL[1]	ABC[1]	TAC[1]	Catch[3]	OFL[2]	ABC[2]	OFL[2]	ABC[2]
W	--	302	302	67	--	301	--	299
C	--	3,727	3,727	262	--	3,688	--	3,644
WYAK	--	5,532	5,532	5	--	5,474	--	5,409
SE	--	3,911	3,911	4	--	3,870	--	3,824
Total	16,159	13,472	13,472	338		13,334		13,177

Responses to SSC and Plan Team Comments

- *GPT, Nov 2013: Explore random effects survey averaging approach for apportionment calculations.* Will address this in 2015, including new survey data.

- *GPT, Nov. 2013/SSC, Dec 2013: Based on suggestions from the author, investigate catchability and natural mortality.* Planned for 2015 full assessment; will do a joint likelihood profile over catchability and natural mortality and consider estimation of one or both parameters using priors.

- *GPT, Nov. 2013/SSC Dec 2013: Do a stock structure template.* Will do this in 2015.

- *GPT, Nov. 2013: Pursue items listed for future research by author in 2013 assessment.* See "Data Gaps and Research Priorities" on next slide

Data Gaps and Research Priorities

- Explore ways to better account for uncertainty (e.g. uncertainty in natural mortality and catchability)

- Develop an ageing error matrix for GOA Dover sole

- Explore adjusting effective sample sizes of survey length composition data to number of hauls

- Explore potential causes of patterns in early recruitment deviations estimated by some 2013 alternative models.

GOA Flathead Sole (update)

Carey McGilliard

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2014	2015	2015*	2016*
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	252,361	253,418	254,602	256,029
Female spawning biomass (t)				
Projected				
Upper 95% confidence interval	84,076	83,287	83,900	83,606
Point estimate	84,058	83,204	83,818	83,342
Lower 95% confidence interval	84,045	83,141	83,754	83,135
$B_{100\%}$	88,829	88,829	88,829	88,829
$B_{40\%}$	35,532	35,532	35,532	35,532
$B_{35\%}$	31,090	31,090	31,090	31,090
F_{OFL}	0.61	0.61	0.61	0.61
$maxF_{ABC}$	0.47	0.47	0.47	0.47
F_{ABC}	0.47	0.47	0.47	0.47
OFL (t)	50,664	50,376	50,792	50,818
maxABC (t)	41,231	41,007	41,349	41,378
ABC (t)	41,231	41,007	41,349	41,378

Status	As determined in 2012 for:		As determined in 2013 for:	
	2011	2012	2012	2013
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

Area Apportionment

Quantity	Western	Central	West Yakutat	Southeast	Total
Area Apportionment	30.88%	60.16%	8.55%	0.41%	100.00%
2015 ABC (t)	12,767	24,876	3,535	171	41,349
2016 ABC (t)	12,776	24,893	3,538	171	41,378

Summary Information

Year	Biomass[1]	OFL[2]	ABC[2]	TAC[2]	Catch[3]
2013	236,745	61,036	48,738	30,496	2,816
2014	252,361	50,664	41,231	27,746	2,317
2015	254,602	50,792	41,349		
2016	256,029	50,818	41,378		

More Summary Information

Area	2014				2015		2016	
	OFL[1]	ABC[1]	TAC[1]	Catch[3]	OFL[2]	ABC[2]	OFL[2]	ABC[2]
W	--	12,730	8,650	202	--	12,767	--	12,776
C	--	24,805	15,400	2,114	--	24,876	--	24,893
WYAK	--	3,525	3,525	1	--	3,535	--	3,538
SE	--	171	171	0	--	171	--	171
Total	50,664	41,231	27,746	2,317	50,792	41,349	50,818	41,378

Responses to SSC and Plan Team Comments

- *GPT, Nov 2013: Explore natural mortality and catchability and effects on selectivity. Potentially use a prior on natural mortality based on max observed age.* A joint likelihood profile over natural mortality and catchability is planned and exploration of using a prior on natural mortality based on max observed age will be considered for the 2015 assessment

- *GPT, Nov 2013; SSC, Dec 2013: Develop a stock-specific ageing error matrix, explore extreme patterns in early recruitment deviations that occurred in some 2013 models.* Will do in 2015.

Data Gaps and Research Priorities

- Develop a stock-specific ageing error matrix
- Adjust effective sample sizes of survey length frequencies to number of hauls
- Explore natural mortality and catchability and methods for accounting for uncertainty in these parameters into the assessment
- Explore potential causes of extreme early recruitment deviations that occurred in some models in 2013.
- Request ageing of otoliths from fishery

End

Exploration of the early rec dev pattern (already done for Dover sole)

- - not having as many early recruits and not having any early recruits and having even more early recruits

- - including early recruits in the main rec dev vector

- - length based asymptotic selectivity for survey 1

- - dome-shaped selectivity for survey 1

- - length-based asymptotic selectivity for the fishery

- -Leaving out various years of age-comp data

- - leaving out the influence of the length comps

- - leaving out the influence of the age comps (eliminates the problem)

- - leaving out the survey biomass years corresponding to a downward trend in biomass

- - adding in the 1984 and 1987 comp data

- - limiting the maximum value of rec devs (makes a much bigger red line loop/mismatch between observed and expected) for the survey 1 female age comps