GOA Flathead Sole

Carey McGilliard

November 2016

	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2016	2017	2017*	2018*
l mortality rate)	0.2	0.2	0.2	0.2
	3a	3a	3a	3a
total (3+) biomass (t)	265,088	269,388	269,638	272,323
Female spawning t)	82,375	82,690	82,819	84,273
	92,165	92,165	92,165	92,165
	36,866	36,866	36,866	36,866
	32,258	32,258	32,258	32,258
	0.4	0.4	0.40	0.40
	0.32	0.32	0.32	0.32
	0.32	0.32	0.32	0.32
	42,840	43,060	43,128	43,872
(t)	35,020	35,187	35,243	35,829
	35,020	35,187	35,243	35,829
	As determined in 2015 for:		As determined in 2016 for:	
	2014	2015	2015	2016
ng	no	n/a	no	n/a
d	n/a	no	n/a	no
ing overfished	n/a	no	n/a	no

- Tier 3a age-structured assessment
- OFL and ABC as recommended this very similar to those recommende year for 2017.
- Used average 2011-2015 Oct 8-De catches to estimate Oct 8-Dec 31 2 catches
- Used average 2011-2015 total catc projected catch for 2017.
- 2015 final catch: 2,000 t
- 2016 catch estimate: 2,544 t
- 2017 projected catch: 2,454 t

Area Apportionment

Quantity	Western	Central	West Yakutat	Southeast	Total
Area Apportionment	31.49%	57.71%	8.37%	2.43%	100.00%
2017 ABC (t)	11,098	20,339	2,949	857	35,243
2018 ABC (t)	11,282	20,677	2,998	872	35,829

ortion of survey biomass in each area calculated using estimates of area-specific survey biomass from the sur
aging random effects model (as for 2015)

onses to Plan Team Comments, Research Priorities

2015:

y for future assessments is to analyze ageing error data

e the relationship between natural mortality and catchability in the model, alternative par , and the effects of these parameters on estimation of selectivity and other parameters.

e ways to better account for scientific uncertainty, especially uncertainty associated with eters that are currently fixed in the model."

Response:

nalyze ageing error using the methods described in Punt et al. (2008) for 2017.

clude a likelihood profile over M and q in the next full assessment.

ed sensitivity analysis, assigning priors to currently fixed parameters and running the asses as a Bayesian analysis to better account for uncertainty in parameters that are currently f

GOA Rex Sole

Carey McGilliard

November 2016

	As estimated or *recommended this* year for:		As estimated or *recommended this* year for:	
	2016	2017	2017	2018
mortality rate)	0.17	0.17	0.17	0.17
	5	5	5	5
tal (3+) biomass (t)	67,941	68,074	75,359	76,356
vning biomass (t)	43,808	46,292	47,008	49,317
	56,845	56,845	56,845	56,845
	22,738	22,738	22,738	22,738
	19,896	19,896	19,896	19,896
	0.170	0.170	0.17	0.17
*0.75*M*	0.128	0.128	0.128	0.128
	0.128	0.128	0.128	0.128
	9,791	9,810	10,860	11,004
	7,493	7,507	8,311	8,421
	7,493	7,507	8,311	8,421
	As determined in 2015 for:		As determined in 2016 for:	
	2014	2015	2015	2016
	no	n/a	no	n/a
	n/a	no	n/a	no

- Age structured model, but Tier 5 management because it appears fishery selectivity occurs after m
- Total biomass listed in the specs "adult biomass," calculated using maturity curve as a proxy for fish selectivity
- OFLs and ABCs are calculated usi Baranov catch equation with "ad biomass" as an input
- This year's estimated catch for 2 was 1,771 t, while last year's pro 2016 catch was 3,188 t.

Area Apportionment

Quantity	Western	Central	West Yakutat	Southeast	Total
Area Apportionment	17.55%	59.32%	10.22%	12.90%	100.00%
2017 ABC (t)	1,459	4,930	850	1,072	8,311
2018 ABC (t)	1,478	4,995	861	1,087	8,421

Proportion of survey biomass in each area calculated using estimates of area-specific survey biomass from the survey averaging random effects model (as for 2015)

onses to Plan Team Comments, Research Priorities

ecember 2015 and GOA Plan Team, November 2015: Examine rex sole age, growth
y information and update the growth data used in the model.
ated data for growth estimates planned for 2017 assessment
rity info will be updated as well, if possible
ageing error estimates will be included, if possible

C concurs with the PT and author recommendation that more information should be
d on fishery size and age compositions to inform selectivity parameters and potenti
estimates of harvest rates.
log of GOA rex sole otoliths from the fishery being aged; will be complete in time
sis prior to September 2017 Plan Team meeting.

be included in the model to explore whether age information changes estimates of
ry selectivity relative to maturity. **Top priority for 2017.**

GOA Deepwater Flatfish Complex

Carey McGilliard

November 2016

es	Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
		2016	2017	2017*	2018*
	M (natural mortality rate)	0.085	0.085	0.085	0.085
	Tier	3a	3a	3a	3a
	Projected total (3+) biomass (t)	141,824	143,007	143,333	144,611
	Projected Female spawning biomass (t)	49,179	49,271	49,331	49,347
	$B_{100\%}$	57,871	57,871	57,871	57,871
ole	$B_{40\%}$	23,148	23,148	23,148	23,148
	$B_{35\%}$	20,255	20,255	20,255	20,255
	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)	10,858	10,924	10,938	11,046
	maxABC (t)	9,043	9,097	9,109	9,199
	ABC (t)	9,043	9,097	9,109	9,199
	Tier	6	6	6	6
turbot	OFL (t)	238	238	238	238
	maxABC (t)	179	179	179	179
	ABC (t)	179	179	179	179
	Tier	6	6	6	6
sole	OFL (t)	6	6	6	6
	maxABC (t)	4	4	4	4
	ABC (t)	4	4	4	4
	OFL (t)	11,102	11,168	11,182	11,290
	maxABC (t)	9,226	9,280	9,292	9,382
	ABC (t)	9,226	9,280	9,292	9,382
Flatfish ex	**Status**	As determined in 2015 for:		As determined in 2016 for:	
		2014	2015	2015	2016
	Overfishing	no	n/a	no	n/a
	Overfished	n/a	no	n/a	no

- OFLs and ABCs are specified at the compl only; species-specific values are used to c the complex-level specifications.
- Age-structured model for Dover sole
- Dover sole comprises ~98% of the deepw flatfish catches each year
- Catches are very low as compared to the A
  - 2015 catch: 256 t
  - 2016 projected catch: 207 t
  - 2017 projected catch: 316 t

Responses to Plan Team and SSC Comments

GPT, Nov. 2015: The Team recommends the author explore alternative apportionment strategies for the overall deepwater flatfish complex that will better represent Greenland turbot and deepsea sole distribution in the GOA.

hod 1: Based on combined Deepwater flatfish surv
ass, averaged over 10 years (as for 2015)

Species	Year	Western	Central	West Yakutat	Southeast	Total
		2.0%	37.9%	32.5%	27.6%	100.0%
Deepwater Flatfish	2017	187	3,521	3,018	2,566	9,292
	2018	189	3,555	3,047	2,591	9,382

hod 2 (new):

onment based on:
dom effects estimate of Dover
survey biomass
ear average of Greenland
ot survey biomass
ear average of deepsea sole
ey biomass

Species	Year	Western	Central	West Yakutat	Southeast	Total
		0.9%	37.9%	33.1%	28.2%	100.0%
Dover Sole	2017	77	3,451	3,016	2,565	9,109
	2018	78	3,485	3,046	2,590	9,199
		100.0%	0.0%	0.0%	0.0%	100.0%
Greenland Turbot	2017	179	0	0	0	179
	2018	179	0	0	0	179
		0.8%	73.4%	13.8%	12.0%	100.0%
Deepsea Sole	2017	0	3	1	0	4
	2018	0	3	1	0	4
Deepwater Flatfish	**2017**	**256**	**3,454**	**3,017**	**2,565**	**9,292**
	2018	**257**	**3,488**	**3,047**	**2,590**	**9,382**

Data Gaps and Research Priorities

- Estimate/update new ageing error matrix
- Better account for scientific uncertainty by taking a closer look at parameters that are currently fixed in the model (catchability and natural mortality)