4. Assessment of the Shallow Water Flatfish complex in the Gulf of Alaska (Executive Summary)

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Introduction

Assessment for the shallow water flatfish complex has been moved to a biennial schedule to coincide with the expected receipt of new survey data. Usually, on alternate (even) years we will present an executive summary with last year's key assessment parameters and projections for this year. 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.

The shallow water complex is comprised of northern rock sole, southern rock sole, yellowfin sole, butter sole, starry flounder, English sole, sand sole and Alaska plaice. Northern and southern rock sole are in Tier 3a and are summarized a separate executive summary document (Turnock et al. 2016, last full assessment in A'mar et al. 2015), while the other species in the complex are in Tier 5 and summarized here. For further information regarding the shallow water flatfish complex, please see the last full stock assessment (Turnock et al. 2015 http://www.afsc.noaa.gov/refm/docs/2015/GOAshallowflat.pdf).

Summary of changes in the Assessment Inputs

Changes in the input data: The new information available concerning the shallow water flatfish complex are the updated 2015 catch of 3,354 t and the partial 2016 catch of 3,452 t through October 13. Projected catch to the end of 2016 using the average fraction of catch to October 13 from the last 10 years (83.4%) would be 4,139 t.

Changes in the assessment methodology: The input catches for 2015, 2016 and 2017 for rock sole projections were changed otherwise there were are no changes to the assessment methodology. The random effects model was used to estimate 2015 biomass for the Tier 5 calculations (Turnock et al 2015), while northern and southern rock sole are in Tier 3 (See A'mar et al 2015). Biomass, OFL and ABC values for for 2017 and 2018 for northern and southern rock sole are estimated using projections from the 2015 assessment model with catches updated for 2015 and 2016. Catches in 2015 and 2016 were split evenly between northern and southern rock sole for projections. The total catch in 2016 for rock sole (3,205 t) was estimated using the average fraction of rock sole catch to October 13 over the last 10 years (0.843) and the estimated 2016 catch to October 13 (2,702 t). The catch in 2017 was set at the 2016 catch for rock sole projections. The 2017 biomass, OFL and ABC estimates for the shallow-water complex for 2017 from the 2015 assessment were lower than the updated estimates presented here due to the use of the ABC for the 2016 catch in the rock sole projections. The 2016 catch (3,205 t) used in the current projections for 2016 and 2017 was lower than the ABC estimates for both northern and southern rock sole (27,400 t).

Summary of Results

The 2015 and 2016 catches by species are presented in the following table:

Species		
Shallow-water flatfish	2015 Catch	2016 Catch[1]
Unid shallow-water flatfish	333	220
rock sole	2,622	2,702
Yellowfin sole	1	0
Butter sole	284	436
Starry flounder	77	62
English sole	32	30
Sand sole	2	0
Alaska plaice	1	2
Total shallow-water[2]	3,354	3,452

[1]Through Oct. 13, 2016.
[2]Total values may not equal the sum of species catch due to rounding

The recommended shallow-water flatfish ABC and OFL levels are:

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2016	2017	2017	2018
M (natural mortality rate)[1]	0.2	0.2	0.2	0.2
Tier	3a and 5	3a and 5	3a and 5	3a and 5
Biomass (t)	303,299	277,699	299,858	301,047
F_{OFL}	*	*	*	*
$maxF_{ABC}$	*	*	*	*
F_{ABC}	*	*	*	*
OFL (t)	54,520	50,220	54,583	54,893
maxABC (t)	44,364	40,764	44,512	44,770
ABC (t)	44,364	40,764	44,512	44,770
Status	As determined *last* year for:		As determined *this* year for:	
	2014	2015	2015	2016
Overfishing	No	NA	No	NA

Area Apportionment

The recommended apportionment for the 2017 ABC are estimated using the random effects model estimates of biomass for the shallow water flatfish complex by management areas.

	Western	Central	Yakutat	Southeast
Proportions	0.47	0.43	0.07	0.02
ABC[1]	20,921	19,306	3,188	1,099

[1]The sum over areas may not equal the total ABC due to rounding

Responses to SSC and Plan Team Comments on Assessments in General

SSC (Oct 2016): "The SSC reminds groundfish and crab stock assessment authors to follow their respective guidelines for SAFE preparation."

Authors' response: SAFE guidelines were followed.

Responses to SSC and Plan Team Comments Specific to this Assessment

There were no specific comments for this assessment which can be addressed in an off-cycle year.

Summaries for Plan Team

Species/Assemblage	Year	Biomass	OFL[1]	ABC[1]	TAC[1]	Catch[2]
Shallow water flatfish	2007	365,766	62,418	51,450	19,972	8,788
	2008	436,591	74,364	60,989	22,256	7,390
	2009	436,591	74,364	60,989	22,256	8,483
	2010	398,961	67,768	56,242	20,062	5,534
	2011	398,961	67,768	56,242	20,062	3,974
	2012	329,217	55,943	45,802	37,029	4,022
	2013	433,869	55,680	45,484	37,077	5,515
	2014	384,134	50,007	40,805	33,679	3,917
	2015	287,534	54,207	44,205	35,381	3,354
	2016	303,299	54,520	44,364	36,763	3,452

The recommended 2017 and 2018 shallow-water flatfish ABC and OFL levels with tier 3a estimates from projections run with the 2015 model and updated with 2015 and 2016 catches for northern and southern rock sole (see A'mar et al 2015):

Stock/		**2016**				**2017**		**2018**	
Assemblage	**Area**	**OFL[1]**	**ABC[1]**	**TAC[1]**	**Catch[2]**	**OFL**	**ABC**	**OFL**	**ABC**
Shallow water flatfish	W	--	20,851	13,250	142	--	20,921	--	21,042
	C	--	19,242	19,242	3,309	--	19,306	--	19,418
	WYAK	--	3,177	3,177	0	--	3,188	--	3,206
	SEO	--	1,095	1,094	1	--	1,099	--	1,105
	Total[3]	54,520	44,364	36,763	3,452	54,583	44,512	54,893	44,770

[1]As published in the Federal Register.
[2]As of Oct. 13, 2016.
[3]Total values may not equal the sum of row values due to rounding
Note: Tables of ABCs, OFLs, and TACs published in the Federal Register are available for:
2016: http://alaskafisheries.noaa.gov/sustainablefisheries/specs16_17/goatable2.pdf

Calculations of the 2017 and 2018 shallow-water flatfish ABC and OFL levels by species including values for Tier 3a for northern and southern rock sole (See A'mar et al 2015) are:

Species				2017	2018	As *specified last* year for:				As *recommended this* year for:			
						2016		2017		2017		2018	
Shallow-water flatfish	Tier	FABC	FOFL	Biomass[1]	Biomass[1]	ABC	OFL	ABC	OFL	ABC	OFL	ABC	OFL
Northern rock sole	3a	0.248	0.299	76,837	80,120	11,800	14,000	10,800	12,800	12,283	14,548	12,788	15,146
Southern rock sole	3a	0.186	0.222	133,922	131,828	19,200	22,700	16,600	19,600	18,865	22,215	18,618	21,927
Yellowfin sole	5	0.15	0.2	27,664	27,664	4,150	5,533	4,150	5,533	4,150	5,533	4,150	5,533
Butter sole	5	0.15	0.2	14,221	14,221	2,133	2,844	2,133	2,844	2,133	2,844	2,133	2,844
Starry flounder	5	0.15	0.2	23,981	23,981	3,597	4,796	3,597	4,796	3,597	4,796	3,597	4,796
English sole	5	0.15	0.2	16,257	16,257	2,438	3,251	2,438	3,251	2,438	3,251	2,438	3,251
Sand sole	5	0.15	0.2	643	643	96	129	96	129	96	129	96	129
Alaska plaice	5	0.15	0.2	6,333	6,333	950	1,267	950	1,267	950	1,267	950	1,267
Total[2]				299,858	301,047	44,364	54,520	40,764	50,220	44,512	54,583	44,770	54,893

[1] 2015 Random effects model estimate of biomass except northern and southern rock sole age 3+ model estimates from the projection model and Amar, et al 2015.

[3]Total values may not equal the sum of row values due to rounding

Research Priorities

More aging data is needed to improve estimates of natural mortality for Tier 5 species.

Literature Cited

A'mar, Z.T. and W. Palsson. 2015. Assessment of the northern and southern rock sole (*Lepidopsetta polyxystra and bilineata*) stocks in the Gulf of Alaska for 2014. In: Stock Assessment and Fishery Evaluation Report for Groundfish Resources in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK, USA.

Turnock, B.J., Z.T. A'mar, and T. Wilderbuer. 2015. Assessment of the shallow-water flatfish stock complex in the Gulf of Alaska. In: Stock Assessment and Fishery Evaluation Report for Groundfish Resources in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK, USA.