

GOA 2016 Northern and Southern Rock sole update

N/S rock sole projected values are the only changes to the shallow-water flatfish complex Biomass, OFL and ABC values.

Biomass, OFL and ABC values for other shallow-water flatfish species are same as last year – Biomass was estimated using the random effects model.

Changes in the input data:

The new information available are the updated 2015 catch for rock sole of 2,622 t and the partial 2016 catch of 2,702 t through October 13.

changes in the assessment methodology:

The input catches for 2015, 2016 and 2017 in the projection model were changed otherwise there were no changes to the assessment methodology.

Catches of rock sole 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 catch to October 13 over the last 10 years (0.843) and the estimated catch to October 13, 2016 (2,702 t).

The total catch estimate for 2016 was used as the catch in 2017 for projections.

2017 biomass, OFL and ABC estimates were lower for projections from the 2015 assessment because 2016 catch was set at the ABC (27,400 t all rock sole).

Northern Rock Sole

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2016	2017	2017	2018
M (natural mortality rate)	0.2, 0.250*	0.2, 0.250*	0.2, 0.250*	0.2, 0.250*
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	75,600	68,400	76,837	80,120
Projected Female spawning biomass	35,600	30,900	36,683	38,431
$B_{100\%}$	51,800	51,800	51,800	51,800
$B_{40\%}$	20,700	20,700	20,700	20,700
$B_{15\%}$	18,100	18,100	18,100	18,100
F_{OFL}	0.299	0.299	0.299	0.299
$maxF_{ABC}$	0.248	0.248	0.248	0.248
F_{ABC}	0.248	0.248	0.248	0.248
OFL (t)	14,000	12,800	14,548	15,146
maxABC (t)	11,800	10,800	12,283	12,788
ABC (t)	11,800	10,800	12,283	12,788
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2014	2015	2015	2016
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Estimated in model for males

Southern Rock Sole

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2016	2017	2017	2018
<i>M</i> (natural mortality rate)	0.2, 0.248*	0.2, 0.248*	0.2, 0.248*	0.2, 0.248*
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	138,600	120,200	133,922	131,828
Projected Female spawning biomass	74,000	60,600	71,786	67,851
$B_{100\%}$	93,500	93,500	93,500	93,500
$B_{40\%}$	37,400	37,400	37,400	37,400
$B_{15\%}$	32,700	32,700	32,700	32,700
F_{OFL}	0.222	0.222	0.222	0.222
$maxF_{ABC}$	0.186	0.186	0.186	0.186
F_{ABC}	0.186	0.186	0.186	0.186
OFL (t)	22,700	19,600	22,215	21,927
maxABC (t)	19,200	16,600	18,865	18,618
ABC (t)	19,200	16,600	18,865	18,618
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2014	2015	2015	2016
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Estimated in model for males

Summary of Results

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

Species	2015 Catch	2016 Catch ¹
Shallow-water flatfish		
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

¹Through Oct. 13, 2016.

²Total 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 <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	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 <i>last year for:</i>		As determined <i>this year for:</i>	
	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	20,921	19,306	3,188	1,099

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

¹As published in the Federal Register.

²As of Oct. 13, 2016.

³Total 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 Amar et al 2015) are:

Species		2017			2018		<i>As specified last year for:</i>				<i>As recommended this year for:</i>			
		Tier	FABC	FOFL	Biomass ¹	Biomass ¹	ABC	OFL	ABC	OFL	ABC	OFL	ABC	OFL
Shallow-water flatfish														
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.

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