

Chapter 7: Assessment of the Kamchatka Flounder stock in the Bering Sea and Aleutian Islands

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Executive Summary

Bering Sea and Aleutian Islands (BSAI) Kamchatka flounder is assessed biennially according to the stock assessment prioritization schedule. During odd years, an executive summary is presented with recommendations of harvest levels for the next two years for this species. The most recent full assessment was conducted in 2018, information regarding the stock assessment model and results is available online (Bryan et. al, 2018; <https://www.fisheries.noaa.gov/resource/data/2018-assessment-kamchatka-flounder-stock-bering-sea-and-aleutian-islands>). A full stock assessment document with updated assessment and projection model results is scheduled for November, 2020.

A forward projecting age structured model is the primary assessment tool for BSAI Kamchatka flounder, which qualifies as a tier 3 stock. The assessment model is not run during an off-cycle year, but the projection model is updated with new catch information. This incorporates the most current catch information without re-estimating model parameters and biological reference points.

Summary of changes in assessment input

Changes in the input data: Changes were not made to the assessment model inputs. New data added to the projection model included a final 2018 catch estimate and a preliminary catch estimate for 2019. The 2018 catch input was reduced to 3,108 t from 4,327 t. The 2019 catch input used in the projection model was set equal to 4,486 t. The 2019 catch was estimated by expanding the October 11 catch by a factor of 1.0475. This expansion factor represents the average proportion of catch after October 11th between 2014 and 2018.

Changes in the assessment methodology: Changes were not made to the assessment model.

Summary of Results

The recommended maximum ABC for 2020 from the updated projection model is 9,709 t. This is 5% higher than the 2019 ABC and 2% higher than the 2020 ABC projected from last year's assessment. The corresponding reference values for BSAI Kamchatka flounder are summarized in the table on the following page. Overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition. Status is determined by comparing from the most recent complete year (2018) of official catch to the OFL and comparing the projected spawning biomass relative to $B_{35\%}$. The official Kamchatka flounder, total catch for 2018 (3,108 t) is less than the 2018 OFL (11,347 t) indicating overfishing is not occurring. Spawning biomass is projected to be above $B_{35\%}$ for 2019-2021; hence, the stock is not overfished and it is not approaching an overfished condition.

Catch-biomass ratios were derived from the reported catch and total biomass estimated by the assessment model for 1991 through 2018. This ratio for 2019 was derived from the estimated catch in 2019 and the total biomass from the projection model. Kamchatka flounder were not distinguished from arrowtooth flounder prior to 2011. The catch estimates between 1991 and 2007 were assumed to be 10% of the total arrowtooth catch and this is associated with catch-biomass ratios that were stable at 0.01 (Table 7.1, Figure 7.1). The catch-biomass ratio increased to 0.14 in 2010. It was assumed that Kamchatka flounder

made up 31%, 45%, and 55% of the total arrowtooth catch in 2008, 2009, and 2010, respectively. The catch biomass ratio declined from 0.07 in 2011 to 0.02 in 2018.

Biomass estimates from the EBS shelf trawl survey, EBS slope trawl survey, and the AI trawl surveys are used in the assessment model. The EBS shelf trawl survey was conducted in 2019. Shelf biomass increased by 2% (Figure 7.2).

Quantity	As estimated or <i>specified last</i> year for		As estimated or recommended this year for	
	2019	2020	2020	2021
<i>M</i> (natural mortality rate)	0.11	0.11	0.11	0.11
Tier	3	3	3	3
Projected total (age 2+) biomass (t)	155,251	160,178*	162,709	163,158
Projected female spawning biomass				
Projected	54,779	56,675	57,948	57,892
<i>B</i> _{100%}	107,673	107,673	107,673	107,673
<i>B</i> _{40%}	43,069	43,069	43,069	43,069
<i>B</i> _{35%}	37,685	37,685	37,685	37,685
<i>F</i> _{OFL}	0.108	0.108	0.108	0.108
<i>maxF</i> _{ABC}	0.090	0.090	0.090	0.090
<i>F</i> _{ABC}	0.090	0.090	0.090	0.090
OFL (t)	10,965	11,260	11,495	11,472
maxABC (t)	9,260	9,509	9,708	9,688
ABC (t)	9,260	9,509	9,708	9,688
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2017	2018	2018	2019
Overfishing	No	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Corrected 2020 estimate of total biomass.

Summary for Plan Team

Species	Year	Biomass₁	OFL	ABC	TAC	Catch₂
Kamchatka flounder	2018	148,847	11,347	9,737	5,000	3,108
	2019	155,251	10,965	9,260	5,000	4,283
	2020	162,709	11,495	9,708		
	2021	163,158	11,472	9,688		

¹Total biomass (age 2+) from the age-structured model.

²Current as of October 11, 2019. Source: NMFS Alaska Regional Office Catch Accounting System via the AKFIN database (<http://www.akfin.org>).

Responses to SSC and Plan Team Comments on Assessments in General

“The SSC requests that all authors fill out the risk table in 2019...” (SSC December 2018)

“...risk tables only need to be produced for groundfish assessments that are in ‘full’ year in the cycle.” (SSC, June 2019)

“The SSC recommends the authors complete the risk table and note important concerns or issues associated with completing the table.” (SSC, October 2019)

A risk table will be provided during the next full assessment cycle in 2020.

Responses to SSC and Plan Team Comments Specific to this Assessment

The SSC would encourage examination of the relationship between temperature and catchability.

This will be evaluated during the next full assessment.

The SSC supports the PT recommendations that the age-length transition matrix be re-examined in the next full assessment and a re-evaluation of the assumptions made regarding historical species compositions between arrowtooth and Kamchatka flounders.

This will be evaluated during the next full assessment.

Finally, the SSC suggests that the author explore incorporating aging error into the assessment given the improvements seen in arrowtooth flounder.

This will be evaluated during the next full assessment.

References

Bryan, M.D., T.K. Wilderbuer, J. Ianielli, D. Nichol, and R. Lauth. 2018. Assessment of the Kamchatka flounder stock in the Bering Sea and Aleutian Islands. In Stock assessment and fishery evaluation document for groundfish resources in the Bering Sea/Aleutian Islands region as projected for 2019. Section 7. North Pacific Fishery Management Council, Anchorage, AK.

Tables

Table 7.1. Catch in tons, biomass in tons, and the corresponding catch-biomass ratio.

Year	Catch (t)	Total biomass (t)	Catch/biomass
1991	1,951	124,116	0.02
1992	1,190	126,147	0.01
1993	930	128,284	0.01
1994	1,434	129,828	0.01
1995	928	129,996	0.01
1996	1,465	130,020	0.01
1997	1,047	129,222	0.01
1998	1,524	128,728	0.01
1999	1,138	127,895	0.01
2000	1,323	127,369	0.01
2001	1,406	126,757	0.01
2002	1,185	126,683	0.01
2003	1,325	128,155	0.01
2004	1,818	131,766	0.01
2005	1,424	136,002	0.01
2006	1,344	141,543	0.01
2007	1,192	147,623	0.01
2008	6,625	153,782	0.04
2009	13,455	153,965	0.09
2010	21,342	147,767	0.14
2011	10,004	133,603	0.07
2012	9,509	131,599	0.07
2013	7,766	130,042	0.06
2014	6,467	130,541	0.05
2015	4,994	132,986	0.04
2016	4,851	137,700	0.04
2017	4,503	142,766	0.03
2018	3,108	148,847	0.02
2019	4,486	155,251	0.03

Figures

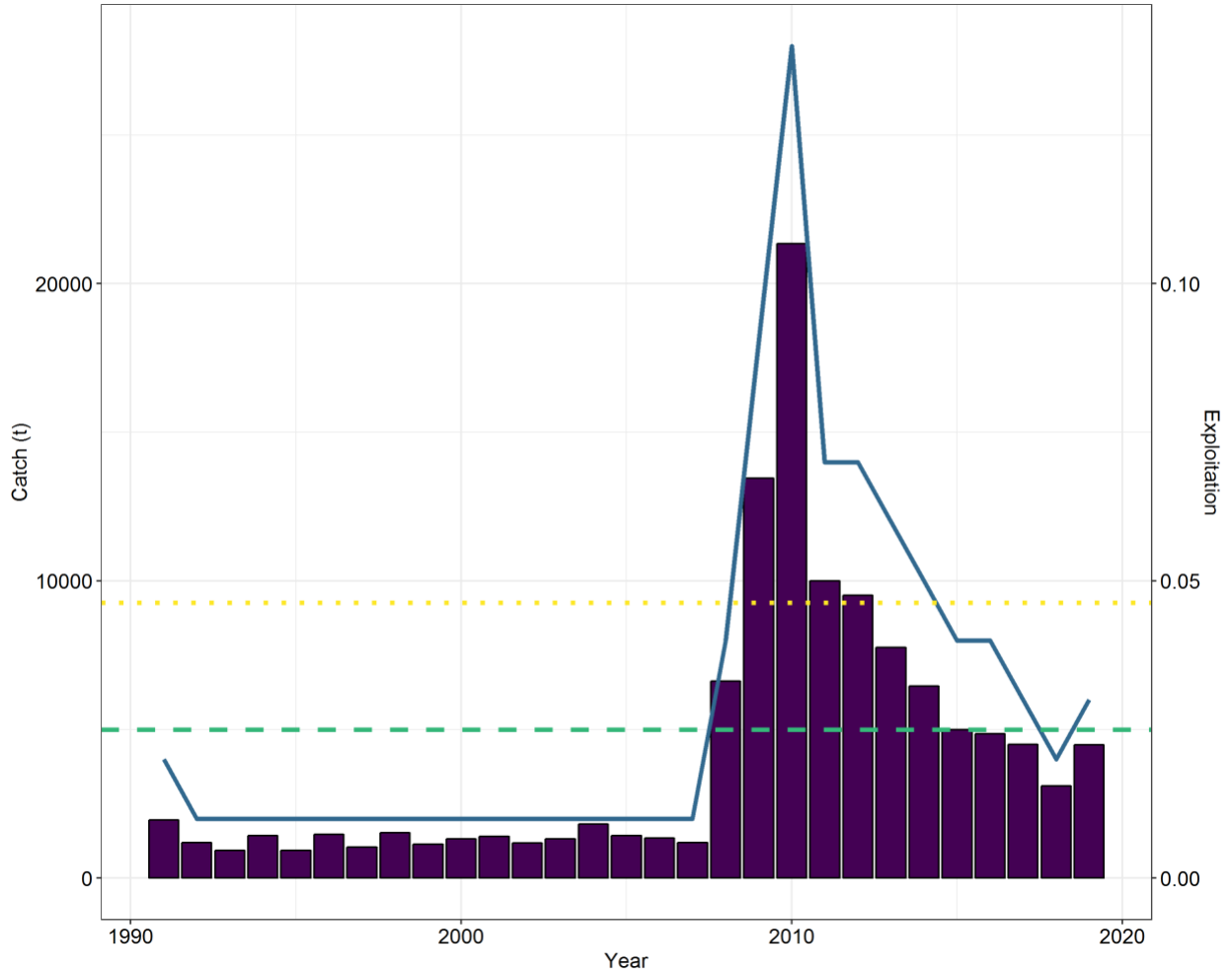


Figure 7.1. Time series of catch in tons (purple bars) and exploitation rate (catch : total biomass, blue, solid line) and the specified 2019 ABC (yellow, dotted line) and the TAC (green, dashed line).

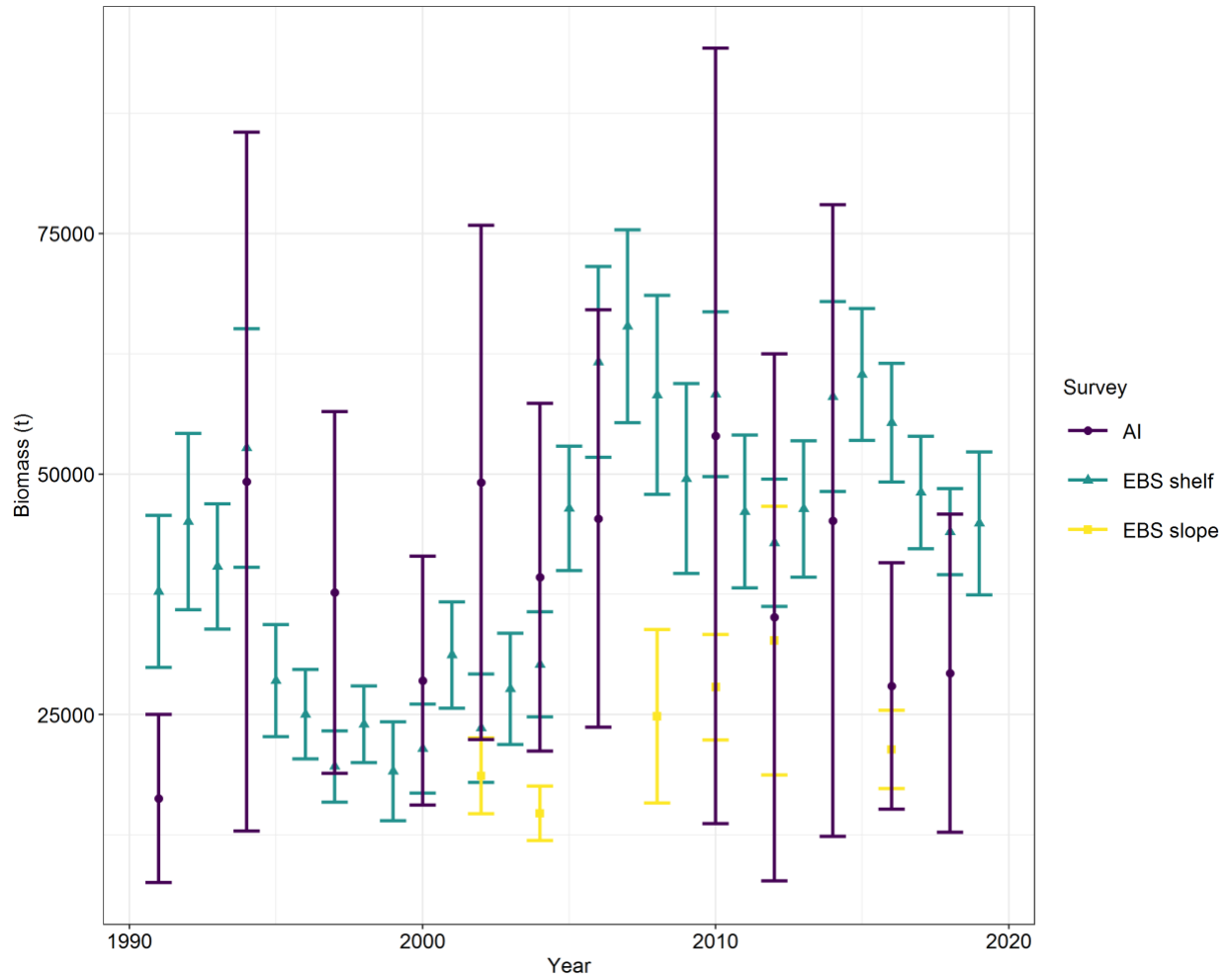


Figure 7.2. Survey biomass estimates from the eastern Bering Sea shelf and slope and the Aleutian Islands.