

6. Assessment of the arrowtooth flounder stock in the Eastern Bering Sea and Aleutian Islands
Ingrid Spies, Thomas K. Wilderbuer, Daniel G. Nichol and Kerim Aydin

October 28, 2015

Alaska Fisheries Science Center
National Marine Fisheries Service

Executive Summary

Arrowtooth flounder (ATF; *Atheresthes stomias*) have historically been assessed on an annual basis in the Bering Sea/Aleutian Islands region to coincide with the annual Bering Sea shelf multispecies groundfish trawl survey conducted each summer. In 2012, Bering Sea/Aleutian Islands (BSAI) arrowtooth flounder were moved to a biennial assessment schedule to coincide with the frequency of trawl surveys in the Aleutian Islands (AI) and the eastern Bering Sea (EBS) slope. These surveys occur in even years, and for these years a full assessment of arrowtooth flounder in the BSAI area will be conducted. Arrowtooth flounder are managed as a Tier 3 stock using a statistical age-structured model as the primary assessment tool. The full 2014 assessment can be found at <http://www.afsc.noaa.gov/REFM/Stocks/assessments.htm>. The 2015 and 2016 estimate of $B_{40\%}$ was 222,019 t. Arrowtooth flounder biomass was estimated to be above this reference point. The estimated exploitation level remained below 5% for 2015.

Summary of changes in assessment inputs

Because this is an “off-year” for the BSAI ATF, new survey information is not incorporated into the assessment model for this update. Instead, a projection model is run with updated catch information. This projection model run incorporates the most recent catch information and provides estimates of 2016 and 2017 ABC and OFL without re-estimating the stock assessment model parameters and biological reference points. The projection model is based on last year’s model results.

New catch information for this update includes the final 2014 catch (19,109 t) and an estimate of 2015 catch. The estimated 2015 complete catch of 13,710 t was obtained by summing the total catch through October 27, 2013 (10,592 t) and the average catch from November-December for 2012 – 2014 (3,118 t). The 2016 catch was set to the average annual catch from 2012-2014 (22,714 t). A summary of the updated projection model results is shown below.

The 2015 eastern Bering Sea shelf survey biomass estimate for arrowtooth flounder was 409,243 t, which is slightly lower than the 2014 estimate of 465,616 t, but similar to the 2012 and 2013 estimates of 402,887 t and 405,509 t, respectively (Figure 1).

Quantity	As estimated or specified last year for:		*As estimated or recommended this year for:	
	2015	2016	2016	2017
<i>M</i> (Female, Male) (natural mortality rate)	0.35, 0.2	0.35, 0.2	0.35, 0.2	0.35, 0.2
Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	908,379	911,652	910,012	920,920
Projected Female spawning	533,731	528,020	535,350	534,347
$B_{100\%}$	555,049	555,049	555,049	555,049
$B_{40\%}$	222,019	222,019	222,019	222,019
$B_{35\%}$	194,267	194,267	194,267	194,267
F_{OFL}	0.180	0.180	0.180	0.180
$maxF_{ABC}$	0.153	0.153	0.153	0.153
F_{ABC}	0.153	0.153	0.153	0.153
OFL (t)	93,856	91,663	94,035	84,156
maxABC (t)	80,547	78,661	80,701	72,216
ABC (t)	80,547	78,661	80,701	72,216
Status	As determined last year for:		As determined this year for:	
	2013	2014	2014	2015
Overfishing		n/a		n/a
Overfished	n/a		n/a	
Approaching overfished	n/a		n/a	

*Projections are based on estimated catches of 13,710 t used in place of maximum permissible ABC for 2016 and 2017.

SSC and Plan Team Comments on Assessments in General.

There are no general comments that apply to BSAI arrowtooth flounder.

SSC and Plan Team comments Specific to this Assessment.

None.

Harvest Recommendations

The projection model was used to estimate the 2016 ABC at 80,701 t, and the 2017 ABC at 72,216 t, using $F_{ABC}=0.153$. The stock is not overfished, and is not approaching a condition of being overfished. Catch for 2015 was estimated as described above, based on the assumption that recent fishing trends will continue.

Summary table for the Plan Team

Year	Biomass (t) ¹	OFL	ABC	TAC	Catch
2014	1,036,960	125,642	106,599	25,000	19,109
2015	908,379	93,856	80,547	22,000	10,592 ²
2016	910,012	91,663	78,661	22,000	
2017	920,920				

¹ Total biomass from age-structured projection model.

² Catch as of October 27, 2015.

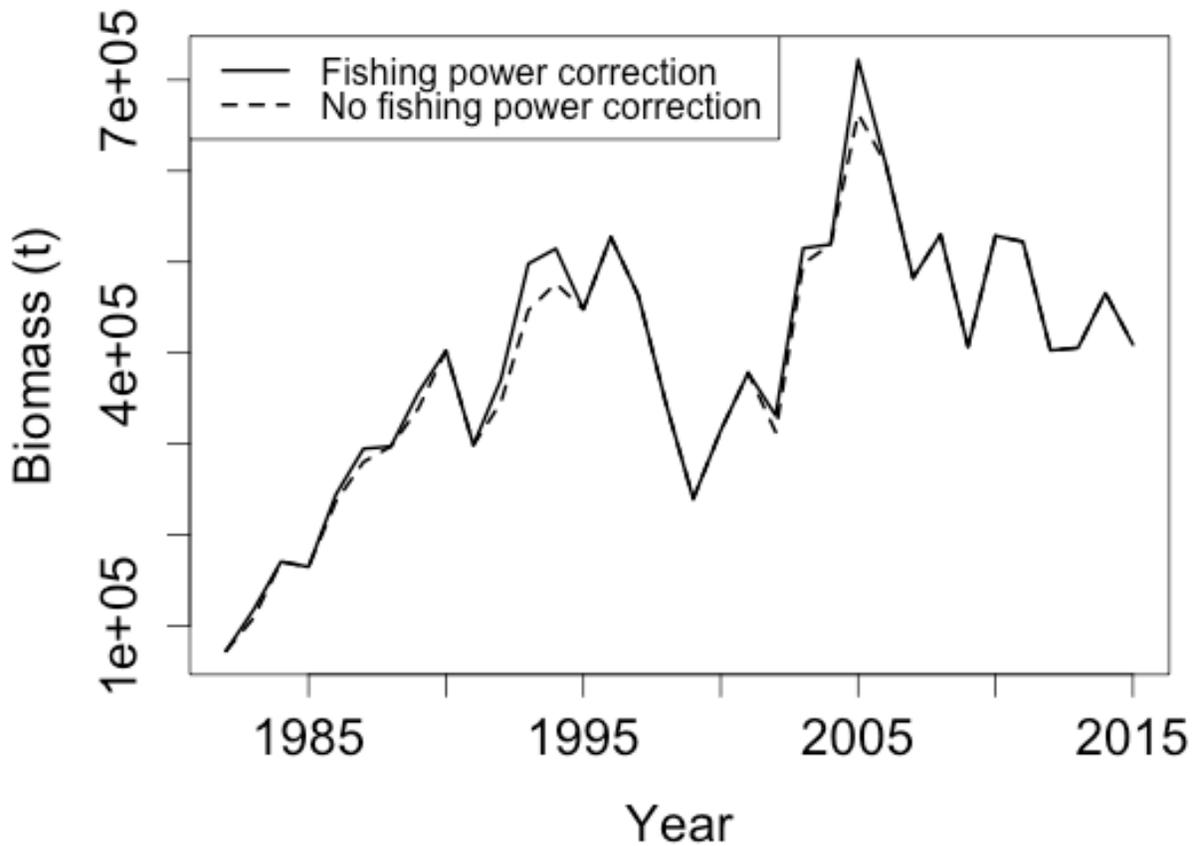


Figure 1. Biomass estimates from the 1982-2015 Eastern Bering Sea shelf survey, with and without fishing power corrections.

(This page intentionally left blank)