



Assessment of the arrowtooth flounder stock in the Bering Sea and Aleutian Islands

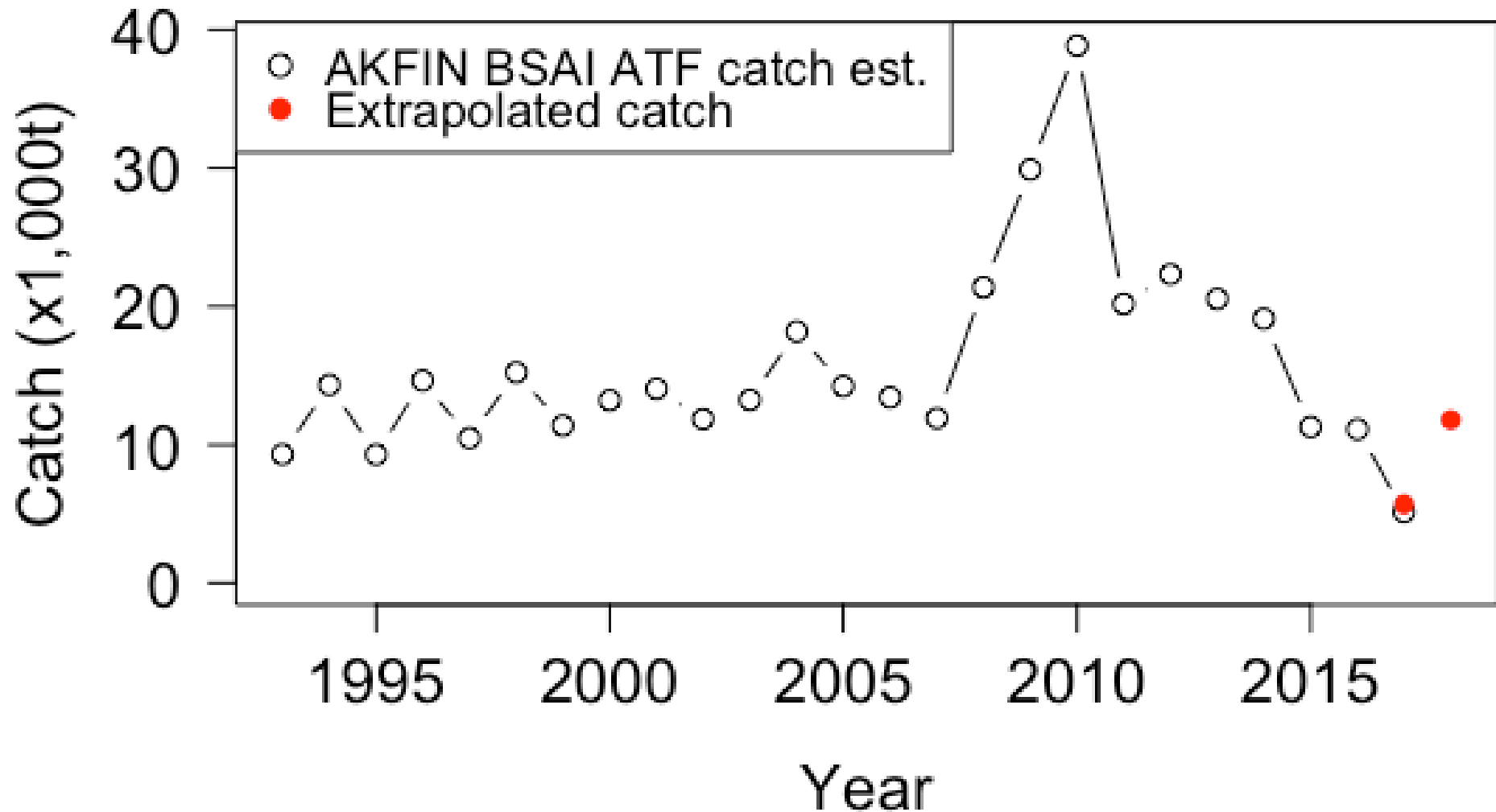
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Quantity	As estimated or <i>specified last year for:</i>		<i>*As estimated or recommended this year for:</i>	
	2017	2018	2018	2019
M (natural mortality rate)**	0.35, 0.2	0.35, 0.2	0.35, 0.2	0.35, 0.2
Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	779,195	772,153	785,141	782,840
Projected Female spawning	485,802	464,066	490,663	472,562
$B_{100\%}$	530,135	530,135	530,135	530,135
$B_{40\%}$	212,054	212,054	212,054	212,054
$B_{35\%}$	185,547	185,547	185,547	185,547
F_{OFL}	0.151	0.151	0.151	0.151
$maxF_{ABC}$	0.129	0.129	0.129	0.129
F_{ABC}	0.129	0.129	0.129	0.129
OFL (t)	76,100	67,023	76,757	75,084
maxABC (t)	65,371	58,633	65,932	64,494
ABC (t)	65,371	58,633	65,932	64,494
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2015	2016	2016	2017
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Projections are based on estimated catches of 5,698 t for 2017 and 11,797 t for 2018.

**Natural mortality rate was fixed at 0.35 for males, 0.2 for males.

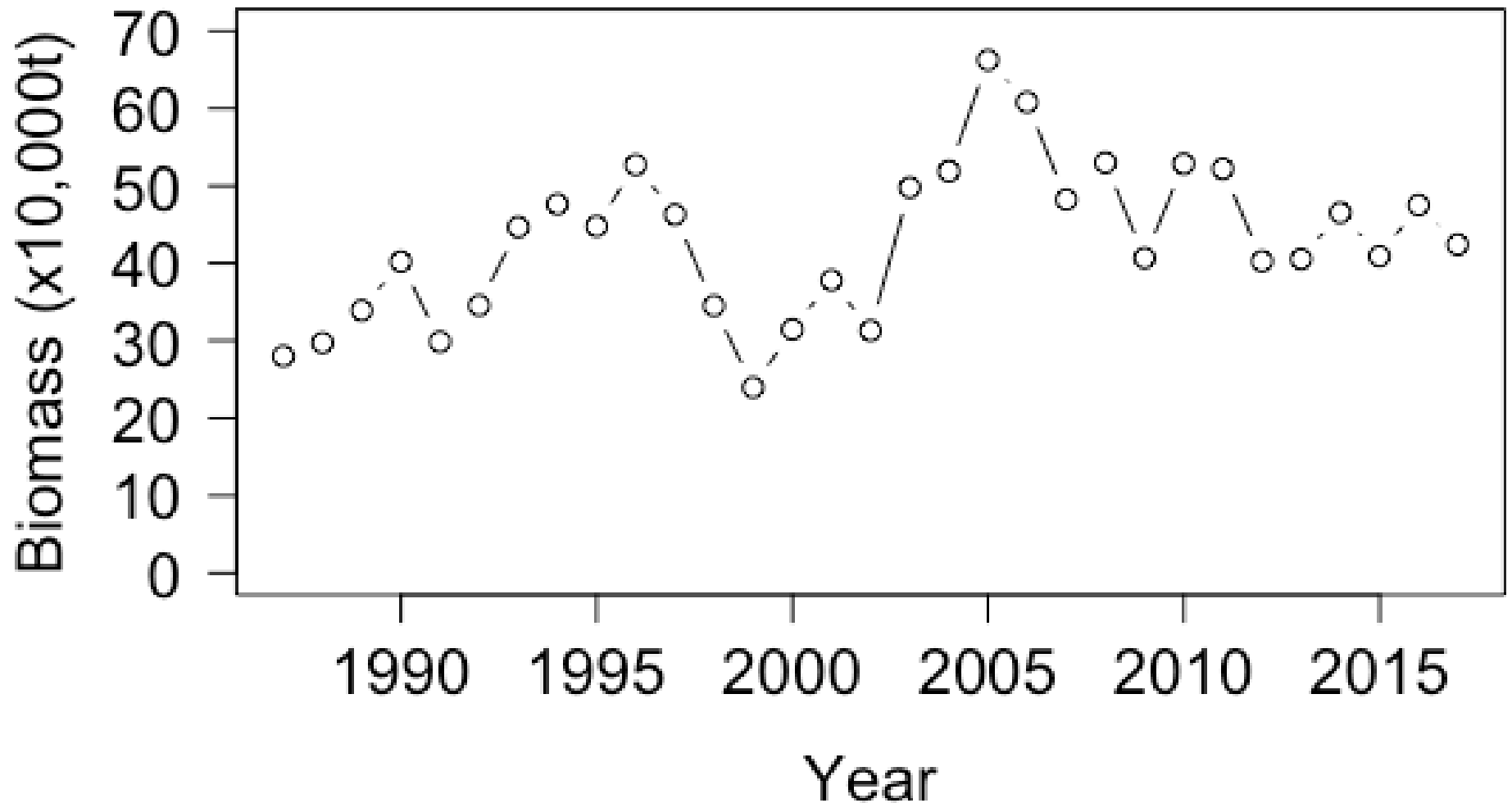
Catch estimates of arrowtooth flounder in the Bering Sea and Aleutian Islands (BSAI) from 1993-2018.



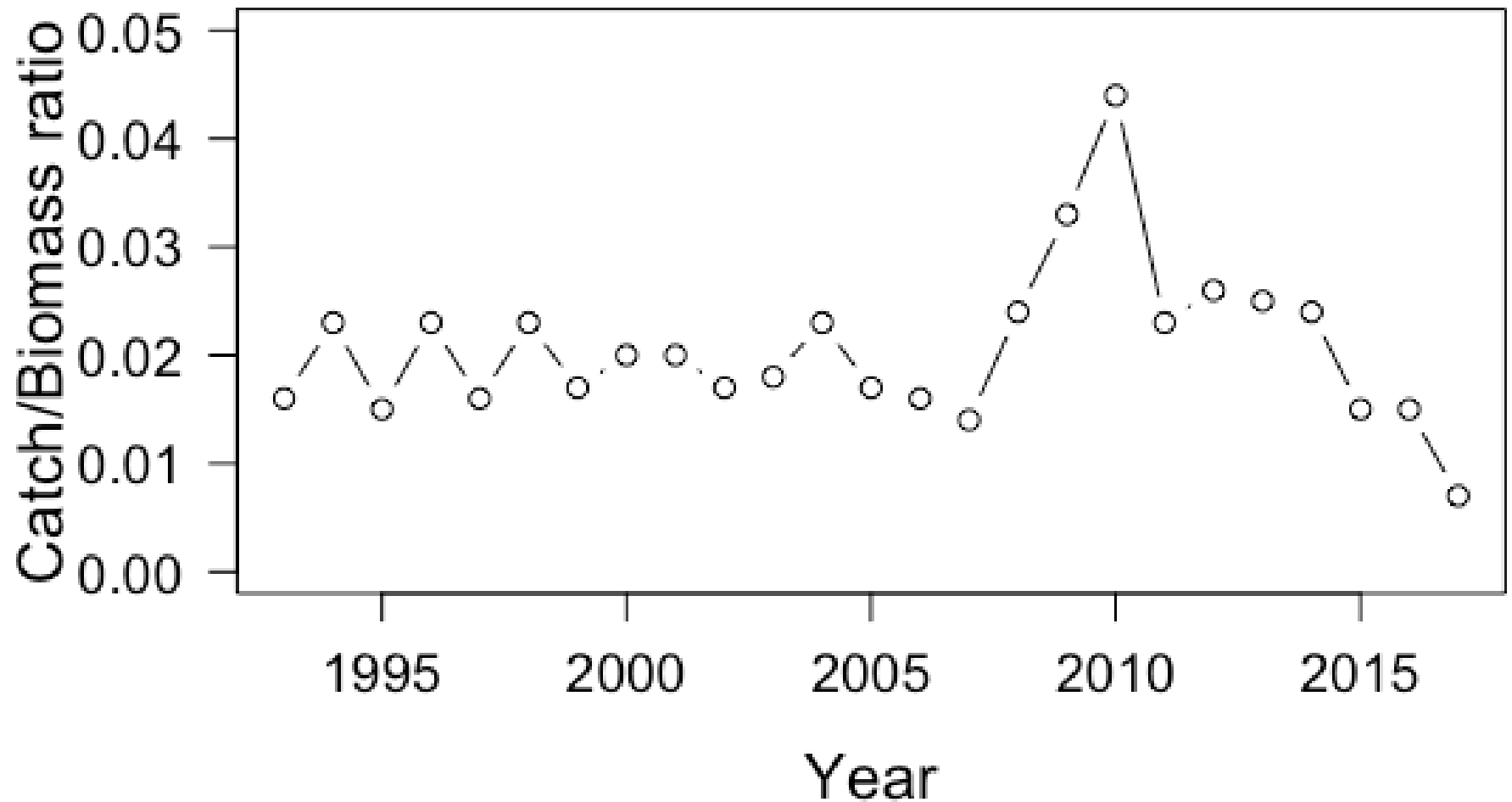
How catch was extrapolated for 2017, 18

- 2017 catch was estimated by calculating the proportion of catch between Sept. 21st and Jan. 1st from the previous five years (2012-2016), 90.2%.
- The total year's catch was extrapolated from the catch through September 21, 2017, for a total of 5,698 t.
- 2018 catch was estimated as the average catch over the past four years, with the average catch from 2014-2016 from AKFIN, and the full year's catch estimate for 2017, for a 2018 estimate of 11,797 t.
- NOTE: ATF catch as of Nov. 14, 2017: 6,163 t (AKFIN)

Eastern Bering Sea shelf survey biomass estimates for arrowtooth flounder, 1987-2017.



Catch to biomass ratio for BSAI arrowtooth flounder from 1993- 2017.



Why decreased ATF catches in BSAI recently?

- In 2008-2010, the walleye pollock total allowable catch (TAC) was low (1×10^6 t, 815,000 t, and 813,000 t in 2008, 2009, and 2010 vs. 1,394,000 t in 2007), which allowed the arrowtooth flounder TAC to be set higher (75,000 t) for each of those years.
- The pollock TAC increased to 1,252,000 t in 2011, which resulted in a decrease of arrowtooth TAC to 25,900 t.
- The year 2011 was the first year that Kamchatka flounder was split out from arrowtooth flounder, and the Kamchatka TAC was 17,700 t in that year.

Why have arrowtooth flounder catches declined recently?

- Prior to the Amendment 80 program which began in 2008, trawl CPs could not target ATF; there was no halibut prohibited species catch (PSC) limit allocated to support an arrowtooth flounder directed fishery.
- In 2008 the Amendment 80 CPs that were in a cooperative could use their halibut PSC in any fishery, so directed fishing for arrowtooth flounder was now an option.
- And at approximately this time, viable products from arrowtooth flounder were developed. Part of Amendment 80 required the catcher/processor fleet to increase their retention of all species, so it made sense to retain more arrowtooth flounder.
- Total retained arrowtooth increased from 5,130 t in 2007 to 15,913 t in 2008.
- In the second half of 2014, the NPFMC put pressure on the Amendment 80 fleet to decrease their halibut PSC use, and decreasing arrowtooth flounder catch may have been a result.

Why have arrowtooth flounder catches declined recently?

Year	Catcher/processor halibut PSC (t)	No. trawl CPs targeting arrowtooth	Kamchatka closure dates for A80 CPs	ATF closure dates
2003		10		
2004		12		
2005		15		
2006		13		
2007		13		
2008	128	16		
2009	237	15		
2010	186	12		
2011	181	18		
2012	425	17		August 11
2013	248	16	July 8	August 21
2014	191	17	August 23	
2015	66	12	June 6	
2016	72	12	May 25	
2017	35	9	August 1	

Why have arrowtooth flounder catches declined recently?

- The number of trawl catcher/processors has decreased in recent years.
- These Amendment 80 CP's often catch arrowtooth flounder and Kamchatka flounder together.
- This is complicated because it is difficult to determine how much of each species the fleet will catch. If the TACs are not similar, one species may close earlier than the other.
- Usually the Kamchatka flounder TAC is much lower than arrowtooth so that fishery closes earlier than arrowtooth.
- The fleet prefers Kamchatka because it usually has a higher value, and may decide not to target arrowtooth until the Kamchatka fishery closes.

Why have arrowtooth flounder catches declined recently?

- Also in 2017 there was a change in vessel ownership. Several vessels and their license limitation program licenses were bought by other Amendment 80 companies.
- This changed how arrowtooth and Kamchatka flounder were fished in 2017.
- The 2017 companies wanted to keep both species open as long as possible in 2017 to reduce discards.
- Directed fishing for arrowtooth was closed in 2012 and 2013 because the directed fishing allowance was reached in those years.

Why have arrowtooth flounder catches declined recently?

- “They were being quite elusive this year, especially in July/August when we usually pull in quite a bit. “
- “My guess is that we hit our turbot number – and that knocked us out of the arrowtooth target.”

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Questions?