

## 21. Assessment of the squid stock complex in the Bering Sea and Aleutian Islands

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### Executive Summary

Because reliable biomass estimates do not exist for squids in the Bering Sea and Aleutian Islands (BSAI), harvest recommendations are made using Tier 6 criteria. Under Tier 6, Overfishing Level (OFL) is defined as the average catch during the period 1978-1995, and Acceptable Biological Catch (ABC) is defined as 0.75 \* OFL. As a result the harvest recommendations do not change from year to year. New information regarding squids comes mainly from the eastern Bering Sea (EBS) slope and Aleutian Islands (AI) trawl surveys. Because these are biennial surveys, full assessments are only conducted in years when those surveys occur. In “off” years, an executive summary is prepared with updated catch data.

#### *Summary of changes*

Catch data are updated through September 18, 2013.

#### *Summary of results*

- 1) Incidental catches were low in 2013 and have been consistently low since 2008 (Tables 1-3).
- 2) Several modest but interesting changes occurred in the pattern of squid catches in 2013: (a) for the first time, more removals occurred in the arrowtooth flounder fishery than in the pollock fishery, which has historically been the main source of squid catches (Table 2), (b) also for the first time, catches in the AI exceeded those in the EBS (Table 1 & 3). Both of these changes appear to be due to a large reduction in the amount of squid captured by the pollock fishery.
- 3) Retention rates of squids are fairly consistent, varying between 38% and 67% (Table 1).

<b>Quantity</b>	As estimated or <i>specified last</i> year for:		As estimated or <i>recommended this year for:</i>	
	<i>2013</i>	<i>2014</i>	<b>2014</b>	2015
<i>M</i> (natural mortality)	<i>n/a</i>	<i>n/a</i>	<b>n/a</b>	n/a
Specified/recommended Tier	6	6	<b>6</b>	6
Biomass	<i>n/a</i>	<i>n/a</i>	<b>n/a</b>	n/a
<i>average historical catch 1978-1995</i>	2,620	2,620	<b>2,624</b>	2,624
Recommended OFL ( t)	2,620	2,620	<b>2,624</b>	2,624
Maximum ABC (0.75*OFL; t)	1,970	1,970	<b>1,970</b>	1,970
Recommended ABC (0.75*OFL; t)	1,970	1,970	<b>1,970</b>	1,970
<b>Status</b>	<i>As determined last year for:</i>		As determined this year for:	
	<i>2011</i>	<i>2012</i>	2012	2013
Overfishing	<i>No</i>	<i>n/a</i>	No	n/a
(for Tier 6 stocks, data are not available to determine whether the stock is in an overfished condition)				

## Tables

Table 1. Estimated total catches of squid (t) in the eastern Bering Sea and Aleutian Islands by groundfish fisheries, 1977-2013, and estimated retention rates, 2008-2013. JV=Joint ventures between domestic catcher boats and foreign processors.

Year	Eastern Bering Sea				Aleutian Islands				BSAI total	% retained
	foreign	JV	domestic	total EBS	foreign	JV	domestic	total AI		
1977	4,926			4,926	1,808			1,808	6,734	
1978	6,886			6,886	2,085			2,085	8,971	
1979	4,286			4,286	2,252			2,252	6,538	
1980	4,040			4,040	2,332			2,332	6,372	
1981	4,178	4		4,182	1,763			1,763	5,945	
1982	3,833	5		3,838	1,201			1,201	5,039	
1983	3,461	9		3,470	509	1		510	3,980	
1984	2,797	27		2,824	336	7		343	3,167	
1985	1,583	28		1,611	5	4		9	1,620	
1986	829	19		848	1	19		20	868	
1987	96	12	1	109		23	1	24	131	
1988		168	246	414		3		3	417	
1989		106	194	300		1	5	6	306	
1990			532	532			94	94	626	
1991			544	544			88	88	632	
1992			819	819			61	61	880	
1993			611	611			72	72	683	
1994			517	517			87	87	604	
1995			364	364			95	95	459	
1996			1,083	1,083			84	84	1,167	
1997			1,403	1,403			71	71	1,474	
1998			891	891			25	25	915	
1999			432	432			9	9	441	
2000			375	375			8	8	384	
2001			1,761	1,761			5	5	1,766	
2002			1,334	1,334			10	10	1,344	
2003			1,246	1,246			36	36	1,282	
2004			1,000	1,000			14	14	1,014	
2005			1,170	1,170			17	17	1,186	
2006			1,403	1,403			15	15	1,418	
2007			1,175	1,175			13	13	1,188	
2008			1,494	1,494			49	49	1,542	67%
2009			269	269			91	91	360	51%
2010			305	305			105	102	410	63%
2011			237	223			99	99	336	43%
2012			560	560			128	128	688	66%
2013*			101	101			138	138	240	38%

\* 2013 catch and retention data are incomplete; catch retrieved September 18, retention data retrieved October 28.

Data Sources: Foreign/ JV - AFSC; domestic before 1989 - PacFIN; domestic 1989-2002 - NMFS AKRO BLEND; domestic 2003--present - AKRO CAS. Retention rate estimates are from AKRO.

Table 2. Estimated catch (t) of all squid species combined by target fishery, 2003-2013. Source: AKRO CAS. 2013 data incomplete; retrieved September 18, 2013. YFS = yellowfin sole, FHS = flathead sole, ATF = arrowtooth flounder.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
ATF	7	6	10	4	3	46	96	104	67	60	68
pollock	1,226	977	1,150	1,399	1,169	1,452	209	277	178	495	62
rockfish	12	6	7	6	8	25	18	12	37	33	56
Kamchatka	0	0	0	0	0	0	0	0	48	76	36
Atka	21	7	9	9	5	12	14	16	5	23	14
other flat	3	2	6	0	2	1	0	0	0	0	1
FHS	0	4	1	0	0	0	0	0	0	0	1
YFS	1	0	0	0	0	0	0	0	0	0	0
Pacific cod	9	6	3	1	1	0	0	0	0	0	0
rock sole	0	0	0	0	0	0	0	0	0	0	0
sablefish	0	0	0	0	0	1	0	0	0	0	0
Gr. turbot	3	6	0	0	0	4	23	1	0	0	0
AK plaice	0	0	0	0	0	0	0	0	0	0	0
<b>BSAI total</b>	<b>1,282</b>	<b>1,014</b>	<b>1,186</b>	<b>1,418</b>	<b>1,188</b>	<b>1,542</b>	<b>360</b>	<b>410</b>	<b>336</b>	<b>688</b>	<b>240</b>

\*2013 data incomplete; retrieved September 18, 2013.

Table 3. Estimated catch (t) of all squid species combined by regulatory area, 2003-2013. Source: AKRO CAS. 2013 data incomplete; retrieved September 18, 2013.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
<b>508</b>	0	0	0	0	0	0	0	0	0	0	0
<b>509</b>	2	7	5	162	13	25	1	5	3	16	5
<b>513</b>	2	2	0	1	12	9	2	0	1	2	1
<b>514</b>	0	0	0	0	0	0	0	0	0	0	0
<b>516</b>	0	0	0	0	0	0	0	0	0	0	0
<b>EBS 517</b>	746	587	539	965	690	1,066	143	133	119	306	39
<b>518</b>	0	0	0	0	0	23	40	17	30	17	2
<b>519</b>	484	398	527	261	419	344	74	145	52	189	29
<b>521</b>	12	5	95	15	26	25	9	5	17	20	14
<b>523</b>	0	0	3	0	0	1	0	1	3	0	1
<b>524</b>	0	0	0	0	15	0	0	0	12	9	11
<b>AI 541</b>	9	4	3	2	2	25	66	90	75	114	104
<b>542</b>	10	7	2	6	3	6	5	4	8	6	5
<b>543</b>	17	3	12	7	8	18	20	11	16	8	30
<b>BSAI total</b>	<b>1,282</b>	<b>1,014</b>	<b>1,186</b>	<b>1,418</b>	<b>1,188</b>	<b>1,542</b>	<b>360</b>	<b>410</b>	<b>336</b>	<b>688</b>	<b>240</b>
BSAI OFL	2,624	2,624	2,624	2,624	2,624	2,624	2,624	2,624	2,624	2,624	2,624
BSAI ABC	1,970	1,970	1,970	1,970	1,970	1,970	1,970	1,970	1,970	1,970	1,970
BSAI TAC	1,970	1,275	1,275	1,275	1,970	1,970	1,970	1,970	1,970	1,970	1,970

\*2013 data incomplete; retrieved September 18, 2013.