

Snow Crab Prohibited Species Catch in BSAI Groundfish Fisheries

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C. opilio Bycatch Limitation Zone

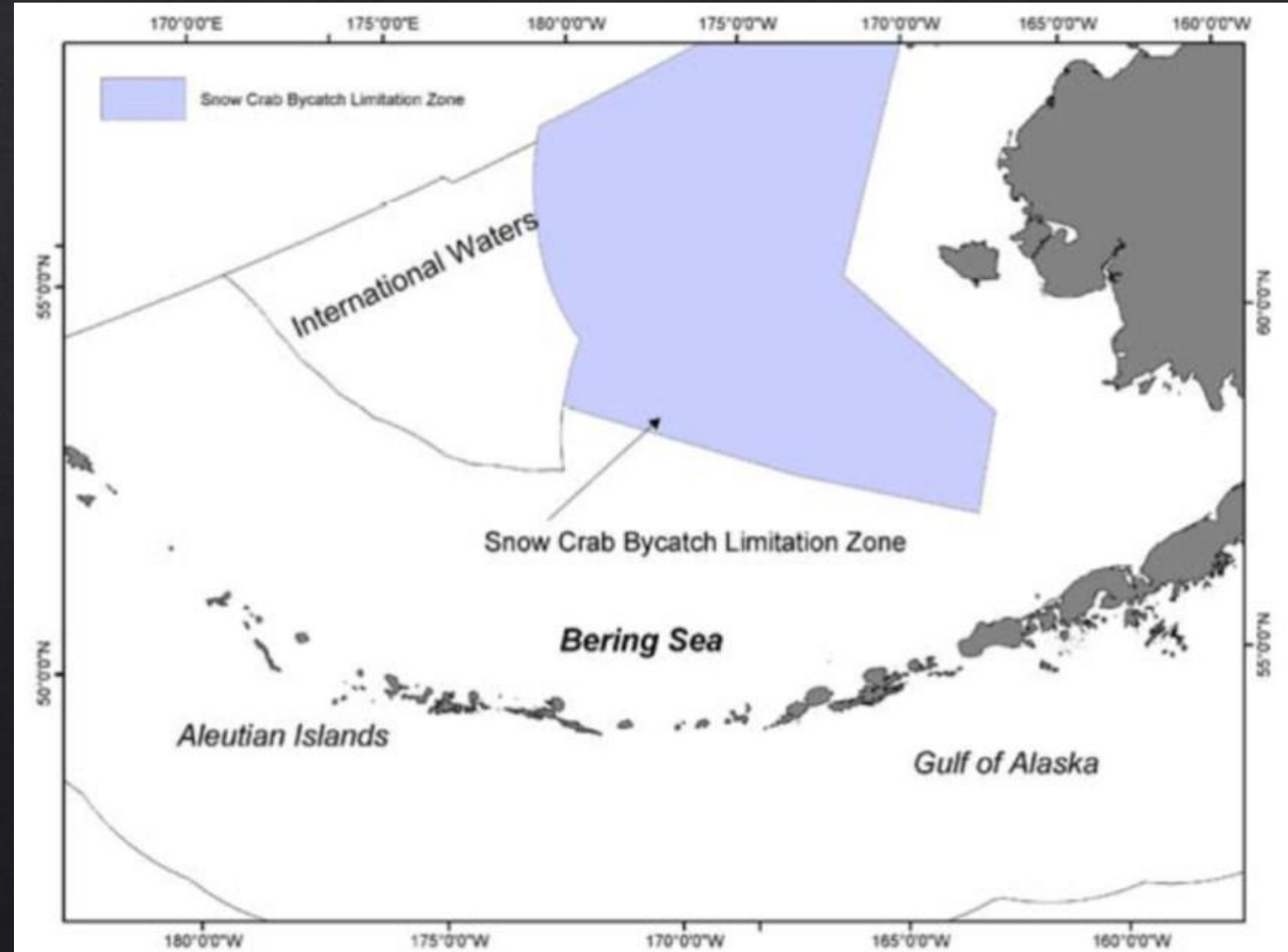
Established by Amendment 40
in 1996

Limits snow crab bycatch by
trawl vessels within zone

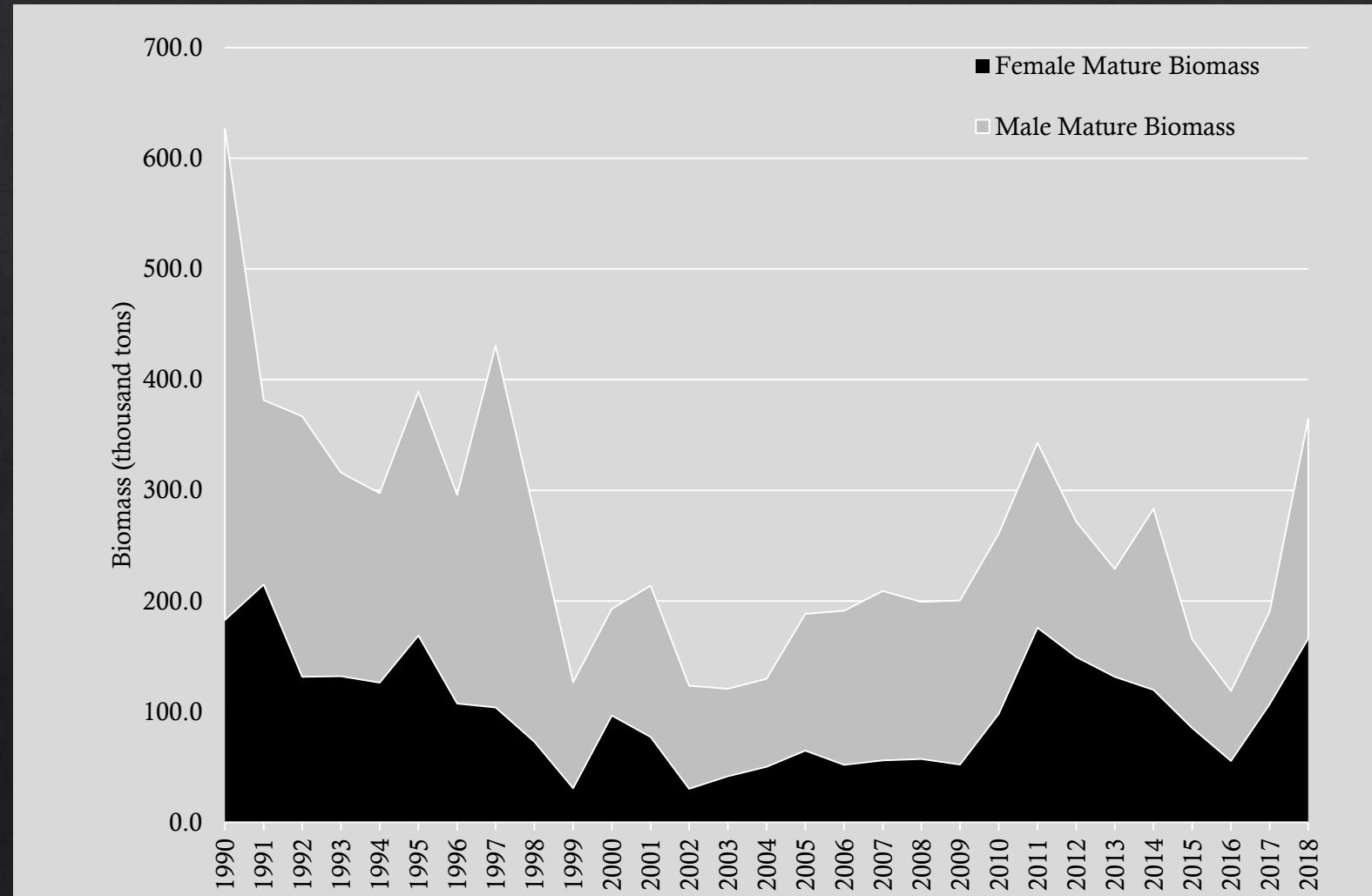
PSC apportioned to CDQ, A80,
TLA sectors

PSC accrues toward limit only
within COBLZ

Fisheries excluded from COBLZ
if PSC limit is exceeded



Snow Crab



Snow Crab

Year	Mature Biomass (kt)	Retained Catch (kt)	Discarded females (kt)	Discarded males (kt)	Trawl Bycatch (kt)
1990	626.7	149.1	0.1	14.7	0.6
1991	381.5	143.0	0.1	11.6	1.9
1992	366.9	104.7	0.1	17.1	1.8
1993	316.0	67.9	0.1	5.3	1.8
1994	297.5	34.1	0.1	4.0	3.5
1995	389.2	29.8	0.2	5.8	1.3
1996	295.8	54.2	0.1	7.4	0.9
1997	430.6	114.4	0.0	5.7	1.5
1998	279.1	88.1	0.0	4.7	1.0
1999	126.7	15.1	0.0	0.5	0.6
2000	192.9	11.5	0.0	0.6	0.5
2001	213.7	14.8	0.0	1.9	0.4
2002	123.4	12.8	0.0	1.5	0.2
2003	120.8	10.9	0.0	0.6	0.8
2004	129.7	11.3	0.0	0.5	1.0
2005	188.4	16.8	0.0	1.4	0.4
2006	191.2	16.5	0.0	1.8	0.8
2007	209.0	28.6	0.0	2.5	0.4
2008	199.2	25.6	0.0	2.1	0.3
2009	200.4	21.8	0.0	1.2	0.6
2010	260.9	24.6	0.0	0.6	0.2
2011	342.9	40.3	0.2	1.7	0.2
2012	271.6	30.1	0.0	2.3	0.2
2013	228.9	24.5	0.1	3.3	0.1
2014	283.2	30.8	0.2	3.5	0.2
2015	165.2	18.4	0.1	3.0	0.2
2016	118.6	9.7	0.0	1.3	0.1
2017	190.8	8.6	0.0	1.9	0.0

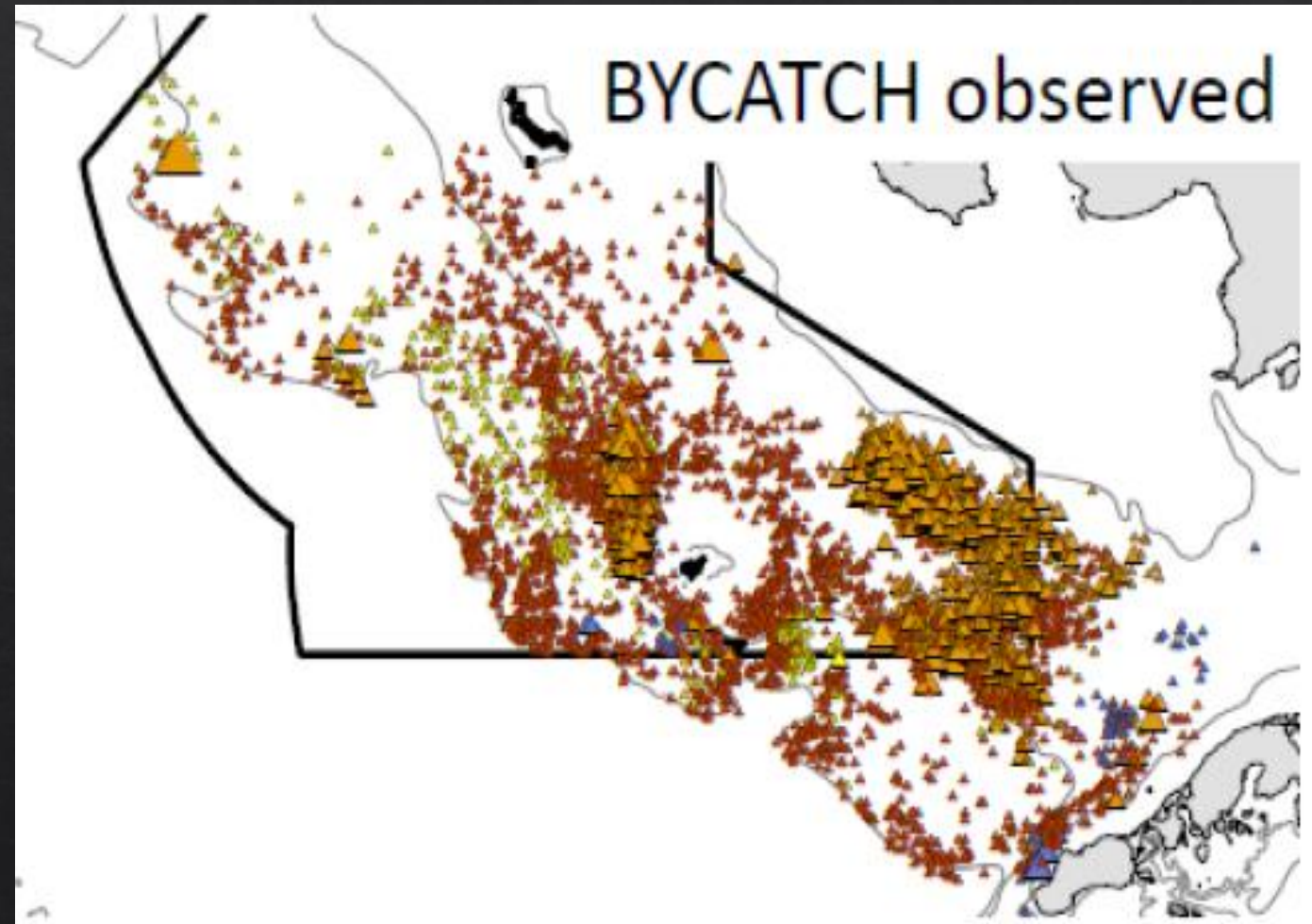
Source: Szuwalski (2018).

Bycatch in groundfish fisheries



Bycatch in groundfish fisheries

Year	Snow Crab PSC usage within COBLZ	Snow crab bycatch outside COBLZ
2008	727,683	832,795
2009	438,587	686,680
2010	1,659,838	787,689
2011	726,304	215,438
2012	584,276	75,016
2013	647,030	69,162
2014	448,608	134,830
2015	484,939	138,395
2016	161,348	48,350
2017	150,113	173,765



Purpose and Need

- ◆ *Management measures in the Bering Sea-Aleutian Island groundfish FMP intended to protect Bering Sea snow crab (*C. opilio*) and their habitat have not been reviewed since they were specified in 1997. Since that time, our ability to model snow crab population dynamics and estimate incidental catch in the groundfish fisheries has improved. Management of the groundfish trawl fisheries has also changed; there is no longer a race-for-fish for some of the sectors that are subject to snow crab PSC limits. Therefore, it is appropriate due to these changes to review and analyze the limits in place and if changes are needed.*

Alternatives

- ◆ Alternative 1: No action. Status quo management
- ◆ Alternative 2: Revise *C. opilio* PSC limits to be based on the stock assessment model estimate. Remove the minimum and maximum *C. opilio* PSC limit for trawl vessels in the COBLZ, and reduce the *C. opilio* PSC limit to (Option 1: 0.10%, Option 2: 0.075%, or Option 3: 0.05%) of the total abundance of *C. opilio*.
- ◆ Alternative 3: Revise *C. opilio* PSC limits to be based on the stock assessment model estimate. Reduce the maximum and/or minimum *C. opilio* PSC limit for trawl vessels in the COBLZ by (Option 1: 10%, Option 2: 15%, or Option 3: 50%).

Effects of using modeled abundance

Year	Published Survey Population Estimate	Published PSC limit	2018 hindcast Model Population Estimate	2018 Hindcast Model PSC limit
2008	3,330,000,000	4,350,000 ¹	3,000,000,000	3,249,000
2009	2,600,000,000	4,350,000 ¹	5,112,000,000	5,641,896
2010	3,060,000,000	4,350,000 ¹	4,852,000,000	5,347,316
2011	7,467,000,000	8,310,480	4,221,000,000	4,632,393
2012	6,337,000,000	7,029,520	3,747,000,000	4,095,351
2013	9,401,000,000	10,501,333	3,830,000,000	4,189,390
2014	10,005,000,000	11,185,892	3,731,000,000	4,077,223
2015	9,852,000,000	11,011,976	5,340,000,000	5,900,220
2016	4,288,000,000	4,708,314	10,170,000,000	11,372,610
2017	8,169,000,000	9,105,477	12,960,000,000	14,533,680
2018	8,182,000,000	9,120,539	10,650,000,000	11,916,450

Effects of removing or modifying min/max

- ◇ Alternative 2 eliminates min and max PSC limits
 - ◇ Higher PSC limits in high snow crab abundance
 - ◇ Lower PSC limits in low snow crab abundance

	Alternative 2		
Abundance necessary:	Option 1: 0.1%	Option 2: 0.075%	Option 3: 0.05%
To exceed 13,000,000 PSC limit	13,000,000,000	17,333,333,333	26,000,000,000
To be less than 4,500,000 PSC limit	4,500,000,000	6,000,000,000	9,000,000,000

Alt 2: Effects on min/max

Table 8. Snow crab PSC usage within COBLZ for all Federal fisheries compared to the PSC Limits for each option under Alternative 2.

Year	Snow Crab PSC usage within COBLZ	Option 1: 0.1% PSC limit	Option 2: 0.075% PSC limit	Option 3: 0.05% PSC limit
2008	727,683	2,850,000	2,100,000	1,350,000
2009	438,587	4,962,000	3,684,000	2,406,000
2010	1,659,838	4,702,000	3,489,000	2,276,000
2011	726,304	4,071,000	3,015,750	1,960,500
2012	584,276	3,597,000	2,660,250	1,723,500
2013	647,030	3,680,000	2,722,500	1,765,000
2014	448,608	3,581,000	2,648,250	1,715,500
2015	484,939	5,190,000	3,855,000	2,520,000
2016	161,348	10,020,000	7,477,500	4,935,000
2017	150,113	12,810,000	9,570,000	6,330,000

Alt 3: Effects on min/max

Table 9. Snow crab PSC usage within COBLZ for all Federal fisheries compared to the PSC Limits for each option under Alternative 3.

Year	Snow Crab PSC usage within COBLZ	Option 1: Reduce min/max 10%	Option 2: Reduce min/max 15%	Option 3: Reduce min/max 50%
2008	727,683	4,050,000 ^a	4,050,000 ^a	3,249,000
2009	438,587	5,641,896	5,641,896	5,641,896
2010	1,659,838	5,347,316	5,347,316	5,347,316
2011	726,304	4,632,393	4,632,393	4,632,393
2012	584,276	4,095,351	4,095,351	4,095,351
2013	647,030	4,189,390	4,189,390	4,189,390
2014	448,608	4,077,223	4,077,223	4,077,223
2015	484,939	5,900,220	5,900,220	5,900,220
2016	161,348	11,372,610	11,050,000 ^b	6,500,000 ^b
2017	150,113	11,700,000 ^b	11,050,000 ^b	6,500,000 ^b

Effects on groundfish fisheries



CDQ Fisheries

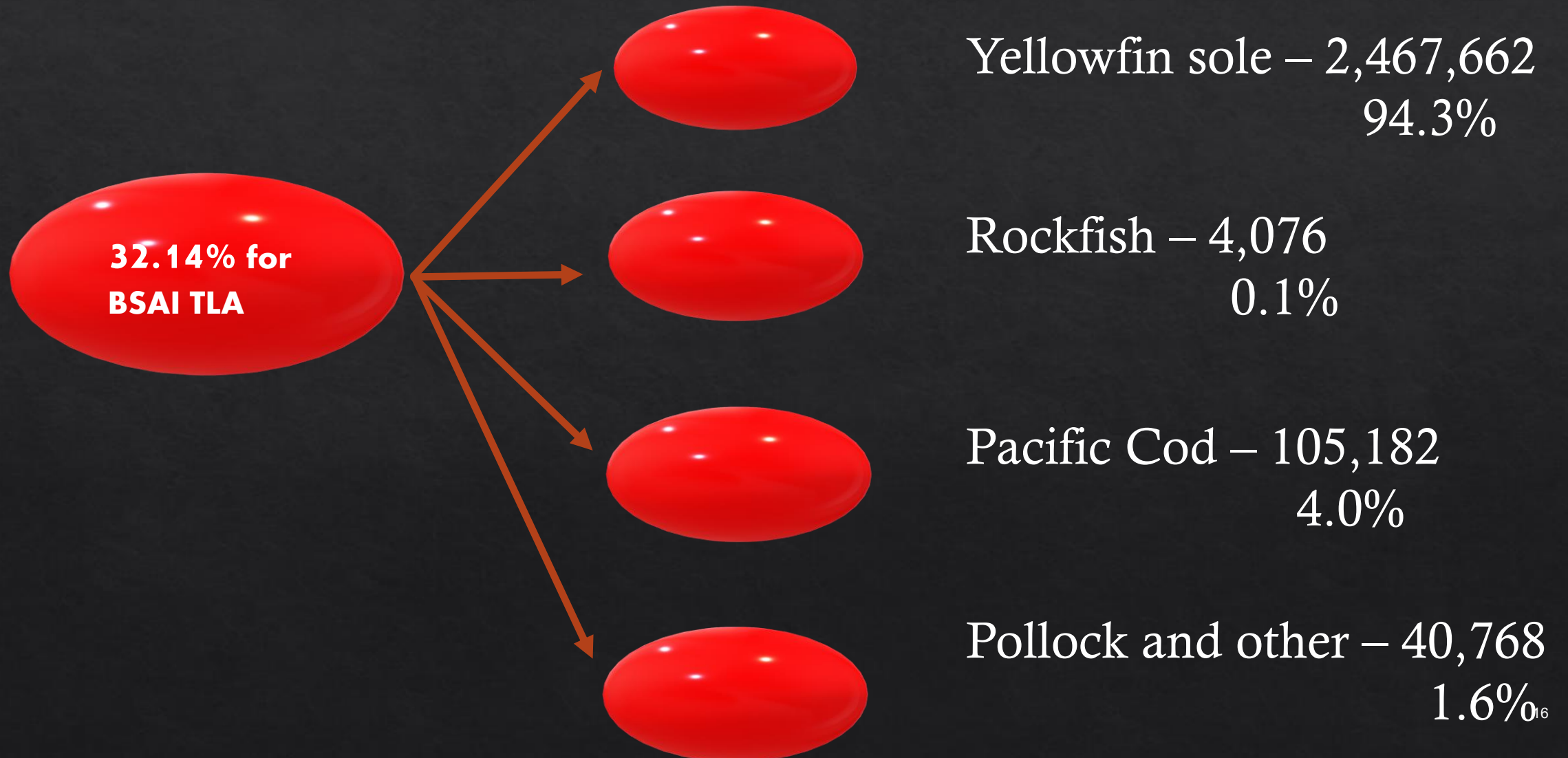
Table 10. Total snow crab PSC usage and limits in the COBLZ area for CDQ, Amendment 80, and BSAI TLA fisheries 2008 - 2017

Year	CDQ PSQ Usage	CDQ PSQ Limit	A80 PSC Usage	A80 PSC Limit	BSAI TLA PSC Usage	BSAI TLA PSC Limit
2008	13,575	465,450	601,773	1,909,256	175,036	1,248,494
2009	59,120	465,450	356,667	1,909,256	107,678	1,248,494
2010	14,972	465,450	302,705	1,909,256	1,383,262	1,248,494
2011	31,107	889,221	507,671	3,647,549	219,179	2,385,193
2012	28,688	752,159	347,333	3,085,323	246,596	2,017,544
2013	21,744	1,123,643	430,838	4,609,135	235,086	3,013,990
2014	35,782	1,196,890	359,948	4,909,594	85,294	3,210,465
2015	41,270	1,178,281	397,828	4,833,261	50,157	3,160,549
2016	12,580	503,790	150,580	2,066,524	2,993	1,351,334
2017	20,401	974,286	131,962	3,996,480	7,020	2,617,688

Impacts to A80 sector

- ◆ Alternative 1 – no change
- ◆ Tables 11-16 show snow crab PSC limits for CDQ, A80 and TLA sectors under each option and Alternative
- ◆ Only Alternative 2, Option 3 results in PSC limit that is lower than PSC usage – only for 2008.
- ◆ Because of how A80 cooperative manages PSC, unlikely that new PSC limits would be exceeded to avoid COBLZ closure
- ◆ However, reasonable to assume some increased cost with lower PSC limits

Impacts to BSAI TLA



Impacts to BSAI TLA

Table 19. Snow crab PSC usage in the COBLZ in BSAI TLA fisheries 2008 – 2017.

	Pacific Cod	Rock Sole	Yellowfin Sole
2008			59,829
2009			21,277
2010			1,378,836
2011			210,629
2012			239,435
2013			199,562
2014		279	71,982
2015			46,588
2016	929		1,781
2017		1,722	3,224

Impacts to BSAI TLA

	Alternative2 Option1: 0.1% of abundance estimate						
Year	TLA Limit	YFS PSC Limit	YFS PSC Usage	Pacific Cod PSC Limit	Pacific Cod PSC Usage	Pollock PSC Limit	Pollock PSC Usage
2008	1,248,494	1,177,330	59,829	49,940		18,727	
2009	1,248,494	1,177,330	21,277	49,940		18,727	
2010	1,248,494	1,177,330	1,378,836	49,940		18,727	
2011	2,385,193	2,249,237	210,629	95,408		35,778	
2012	2,017,544	1,902,544	239,435	80,702		30,263	
2013	3,013,990	2,842,192	199,562	120,560		45,210	
2014	3,210,465	3,027,469	71,982	128,419		48,157	
2015	3,160,549	2,980,398	46,588	126,422		47,408	
2016	1,351,334	1,274,308	1,781	54,053	929	20,270	
2017	2,613,365	2,464,403	3,224	104,535		39,200	

Environmental Assessment

- ◆ No alternative affects how groundfish are allocated
 - ◆ No significant impacts on groundfish target or non-target species or habitat
- ◆ No alternative affects overall fishery related mortality to snow crabs
 - ◆ Only changes how ABC is allocated between directed fisheries and groundfish fisheries
- ◆ No alternative affects how groundfish trawl fisheries are prosecuted
 - ◆ No change to impacts to habitat
 - ◆ No significant impacts to snow crab or their habitat

Environmental Assessment

- ◆ Under all alternatives, some potential for fisheries to be excluded from COBLZ
- ◆ Those fisheries would be displaced to areas outside COBLZ
- ◆ Appears to be a rare event under any alternative
- ◆ Could be increased risk of disturbance to coastal marine mammals under exceptional circumstances