Reduce the Western GOA Pollock Trip Limit Discussion Paper

December 2017

In December 2016 the Council requested that staff evaluate the impacts of lowering the Western Gulf of Alaska (GOA) pollock trip limit from 300,000 lbs. to 200,000 lbs.[1] The Council requested this paper in the context of exploring "potential options to reduce [Chinook salmon] prohibited species catch (PSC)" in the wake of a motion to table the development of the GOA Trawl Bycatch Management Program. Given that context, this document includes Chinook salmon PSC rates and encounter levels across vessel size categories, trip-level landings, and areas that tend to be fished more or less so by "small" (58' LOA) and "large" (all other) trawl catcher vessels (CV).

1 Background

1.1 Regulations and history

Trip Limit

As currently applied, GOA pollock trip limits are defined in regulation at Section 679.7(b)(2). A CV with a Federal Fisheries Permit (FFP) may not retain more than 300,000 lbs. (136 mt) of unprocessed pollock on board at any time during a fishing trip; a trip is defined at Section 679.2 as ending when all fish have been offloaded or transferred from the vessel. Also, a CV may not land more than 300,000 lbs. (136 mt) of unprocessed pollock during a calendar day. Finally, a CV may not land a cumulative amount of pollock from a GOA reporting area that exceeds 300,000 lbs. multiplied by the number of calendar days that the directed fishery is open in that reporting area.

The trip limit regulations were initially implemented with other Steller sea lion pollock fishery mitigation measures in 1999. The 300,000 lbs. trip limit was established to provide temporal dispersion in pollock fishing by slowing the fishery. The parts of the regulation that limit the amount of offloads that can occur in a calendar day and total catch that can be landed in a season were added in 2008 because vessels were circumventing the trip limit and, as stated in the RIR for that action, exacerbating conflicts between larger and smaller trawl vessels that fish for pollock.

Pollock Seasons and Season/Area Apportionment

GOA pollock was first apportioned across four seasons in the Western and Central GOA beginning in 1990 to prevent the rapid harvest of the pollock TAC early in the year (55 FR 37907, September 14, 1990). The four seasons are currently set in regulation as follows: A – January 20 to March 10; B – March 10 to May 31; C – August 25 to October 1; and D – October 1 to November 1. Steller sea lion protection

[1] http://npfmc.legistar.com/gateway.aspx?M=F&ID=d20acc3d-faa0-4c48-9cf1-95d3c39f9ed0.pdf

measure emergency and final rules implemented between 1999 and 2003 maintained the use of seasonal allocations to reduce the potential for the pollock fishery to compete with Steller sea lions for prey. Under the Council's Steller sea lion protection measures implemented in January 2003 (68 FR 204, January 2, 2003) and modified in 2004 (69 FR 56384, September 21, 2004), the combined pollock TAC for the 610, 620, and 630 regulatory areas was allocated equally to each season (25%). Of that 25% seasonal allocation, each regulatory area is allocated a proportion that is determined by the estimated seasonal pollock biomass distribution across the areas; that information is collected every two years during NMFS GOA bottom trawl biomass surveys. In 2017, Area 610 receives 4.67% of the total A and B season TAC for the Western and Central GOA (Areas 610/620/630), and 40.94% of the C and D season TAC. The biomass distribution has shifted over recent years to place a greater proportion of the annual quota for Area 610 in the C/D seasons, meaning that the fleet might have relatively little trouble catching the TAC for the A/B seasons but could be stretched in terms of fleet capacity during the C/D seasons when the overall GOA pollock TAC is high.

Other Limitations

The Western GOA pollock fishery is constrained by an annual Chinook salmon PSC limit of 6,684 fish. If that limit is reached, directed fishing for pollock in the area is closed for the year. Since that regulation was implemented in 2012 (GOA Groundfish FMP Amendment 93), the Council has taken subsequent action to allow NMFS to make discretionary inseason reapportionments between the Chinook salmon PSC limits of the various GOA groundfish sectors that have hard caps – e.g., Central GOA pollock fishery (18,316 Chinook), GOA non-pollock non-Rockfish Program CVs (2,700 Chinook), or GOA trawl catcher/processors (3,600 Chinook). In other words it is possible, but not assured, that the Western GOA pollock fishery could receive additional Chinook salmon PSC from another sector's limit if a closure was imminent and another sector was not projected to use its full cap.

Trawl CVs are not permitted to move immediately between the BSAI and GOA groundfish fisheries. Regulations at Section 679.23(h) define a 72 hour stand down requirement for vessels that were fishing for pollock or Pacific cod with trawl gear in the BSAI before they may deploy trawl gear in the Western or Central GOA. (The same applies in reverse unless a vessel is moving from the GOA to a CDQ fishery in the BSAI.)

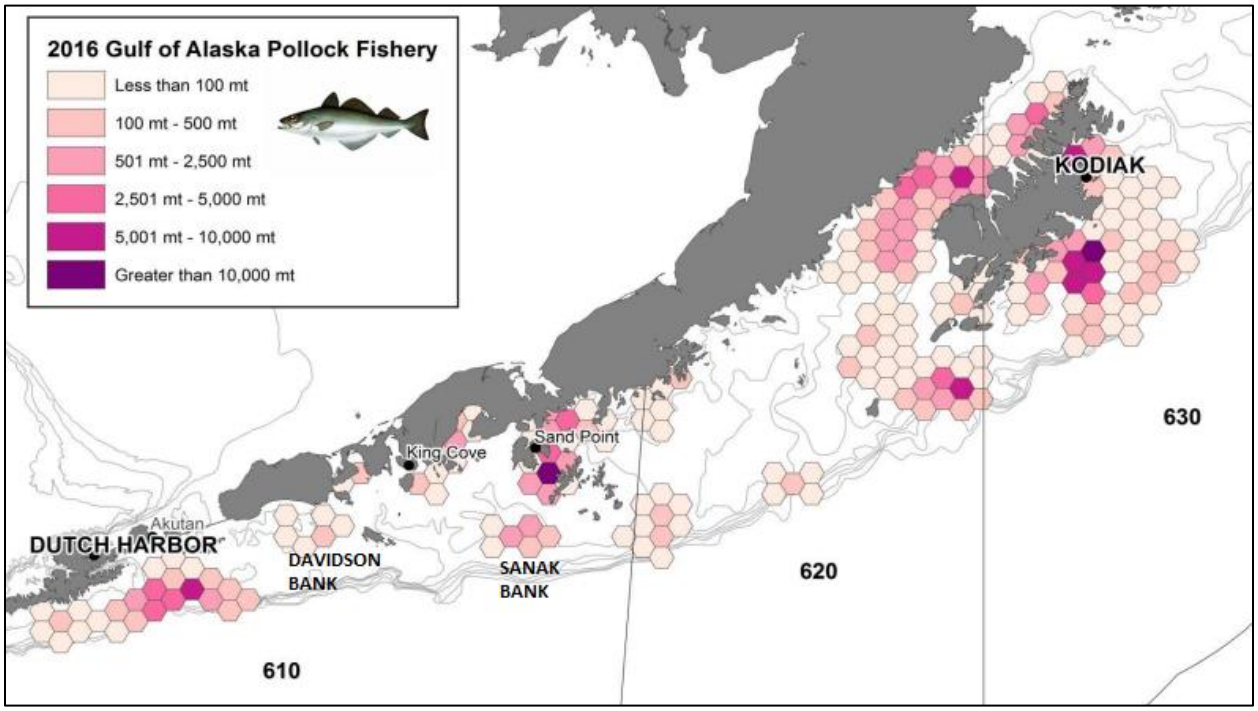
Section 679.23(i) defines an area-exclusivity regulation. CVs that are directed fishing for BSAI pollock during the A season are prohibited from directed fishing for GOA pollock west of the 157 degree W. longitude line (which covers Area 610/Western GOA) until the GOA C season (begins August 25). CVs fishing for pollock in the BSAI B season (begins June 10) are prohibited from directed fishing for GOA pollock in the Western GOA until the A season of the following calendar year. Conversely, CVs fishing for pollock in the Western GOA A/B season may not fish for pollock in the BSAI until its B season, and GOA pollock CVs that fishing in the C/D season may not fish in the BSAI until the A season of the following year.

1.2 Participation and trip-level pollock catch

Spatial distribution

Figure 1 provides a spatial effort snapshot from 2016 that typifies the GOA pollock trawl fishery during recent years. Directed fishing activity is concentrated around Kodiak Island in the Central GOA, but occurs in several areas of the Western GOA (Area 610). Western GOA harvest occurs around Sand Point, King Cove, and on the Sanak Bank in the eastern portion of Area 610. To the west, vessels that deliver to Akutan and a floating processor fish near Unalaska and the Davidson Bank.

Figure 1 Harvest by area for 2016 GOA pollock directed fishery



Source: NMFS 2016 GOA Inseason Management Report; data from NMFS Catch-In-Areas dataset.

Catch by vessel size class

During the 2013 to 2017 period, the Western GOA pollock trawl fishery was prosecuted by between 20 and 29 CVs, with the majority of those being 58' LOA vessels that trawl for pollock and Pacific cod, fish for Pacific cod with pot gear, and seine for salmon in the summer. Vessel counts by season can be found in Table 8 of this paper, in Section 1.4 (2008 through 2017). On average since 2013, the class of 58' vessels has accounted for 77% of the Western GOA pollock trawl fleet and 75% of pollock landings (Table 1). While not perfectly descriptive, anecdotal reports tend to agree that the subset of 58' vessels that are homeported in Sand Point and King Cove generally fish near those communities and around Sanak. Some vessels of a similar size fish farther west depending on weather, markets, and the availability of tender vessels. The vessels that fish around Unalaska include some smaller trawl CVs, and also CVs greater than 58' LOA that are more apt to fish farther from port or in worse weather.

Table 1 Vessel count and landings (mt) in the WGOA pollock trawl fishery, by vessel size (2013 – 2017)

Vessel Count						
	2013	2014	2015	2016	2017	Average
< 60' LOA	17	21	17	21	22	20
> 60' LOA	9	5	3	8	7	6
Total	26	26	20	29	29	26
Pollock Landings						
	2013	2014	2015	2016	2017	Average
< 60' LOA	4,298	10,635	26,794	45,009	18,516	21,050
> 60' LOA	2,954	1,601	1,505	15,873	13,694	7,125
Total	7,252	12,236	28,299	60,881	32,210	28,176

Source: Catch Accounting data.

Seasonal distribution

Table 2 summarizes the Western GOA pollock TAC from 2013 through 2017 as reported in NMFS seasonal catch reports.[2] (Note that these "quota" values may differ from the historical harvest specifications sheets because they reflect seasonal rollovers after-the-fact.) The degree of TAC attainment varies from year to year, reflecting variations in fish aggregation and market quality. These five recent years capture the tail end of a shift of Western GOA pollock TAC from the A/B seasons to the C/D seasons based on trends in the biomass estimates that feed into the harvest specification process. The result is that the amount of pollock available in the Western GOA during the A and B seasons is lower that it was eight to 10 years ago, and greater during the C and D seasons. Table 8 reflects this shift in terms of active vessels, generally trending down in A/B and up in C/D.

Whether or not a season's TAC allocation is fully harvested also depends on fishing conditions and the timing and quality of other fisheries. Effort during the A season is less predictable because participants can stay in other fisheries (e.g., trawl Pacific cod or Federal pot cod) if pollock aggregation and roe content is not desirable on January 20. Moreover, uncaught TAC can be rolled over to the subsequent season for harvest later. It is important to note, however, that inter-seasonal rollovers are capped at 20% of the TAC for the season from which pollock quota is being reallocated. This is of particular importance in the Western GOA C season, where higher annual catch limits and area biomass distribution estimates have led to larger TACs relative to historical levels. If the growth in C season TAC outpaces fleet or processing capacity – which might conflict with salmon markets, especially in years of large pink salmon returns – unharvested quota could be stranded.

Table 2 Western GOA (Area 610) pollock landings by season, 2013 through 2017

	A			B			C			D			Total		
Year	**Catch**	**Quota**	**% Taken**	**Catch**	**Quota**	**% Taken**	**Catch**	**Quota**	**% Taken**	**Catch**	**Quota**	**% Taken**	**Catch**	**Quota**	**% Taken**
2013	935	4,292	22%	4,951	4,292	115%	985	6,348	16%	614	9,744	6%	7,711	24,676	31%
2014	653	4,800	14%	3,548	4,799	74%	7,655	13,235	58%	1,356	13,235	10%	13,364	36,069	37%
2015	116	1,614	7%	2,092	3,632	58%	13,945	12,185	114%	12,286	14,393	85%	28,739	31,824	90%
2016	3,577	3,826	93%	4,282	4,348	98%	30,605	29,305	104%	22,130	27,929	79%	61,252	65,408	94%
2017	2,591	2,232	116%	1,517	2,232	68%	24,998	19,569	128%	20,438	19,569	104%	49,880	43,602	114%

Source: NMFS Seasonal Catch Reports – Pollock; available at https://alaskafisheries.noaa.gov/fisheries-catch-landings

[2] https://alaskafisheries.noaa.gov/fisheries-catch-landings

The NMFS Alaska region website includes a record of GOA pollock season openings and closures by date from 1991 through 2016.[3] This information can be used to gauge how quickly a season's pollock TAC was harvested when it was fully, or near fully, caught. For example, the A season TAC was mostly taken in 2016 and the fishery closed after eight days (Jan. 28). In other recent years the directed fishery remained open until its March 10 closing date. The 2013 B season TAC was taken between March 10 and March 30. In 2015, 2016, and 2017 the C season TAC was fully harvested, but it took the entire length of time, closing on September 30, September 29, and September 27 in each year – just before the October 1 closing date. The D season has remained open until its November 1 closing date in each of the last five years.

The 2017 B season presents a good example of how lower A/B season quotas interact with inseason management strategies to remain within the TAC. The season opened on March 10 with a quota of 2,232 mt, which is small relative to the fleet's daily catch capacity that, according to NMFS, can range between roughly 100 mt and 1,000 mt per day when being fished. Because the season opened on a Wednesday, NMFS preemptively closed the fishery on Friday to prevent overharvest during the weekend when a closure order cannot be issued. The rest of the B season followed a cycle of openings and closures to approach the TAC without going over. While not necessarily the case in the 2017 B season, catching the last portions of a seasonal allocation sometimes requires the trawl fleet to make voluntary agreements to self-impose vessel catch limits so that the season may reopen without risk of overharvest. These agreements can be tenuous, or at least costly to transact on the part of the fleet.

Catch size of landings

Table 3 addresses the issue at the core of this discussion paper. This table counts the number of Western GOA pollock trips that landed more than 200,000 lbs. Those trips would have been curtailed if the existing limit were reduced from 300,000 lbs. Over 70% of such trips were recorded by vessels greater than 60' LOA in 2016 and 2017. While, to the authors' knowledge, no vessels less than 60' LOA pack more than 200,000 lbs. in their hold tanks, it is reported that "towing bags" in addition to a full hold is not uncommon when weather permits. From 2013 through 2017, smaller trawl CVs made 128 trips that delivered over 200,000 lbs. of pollock, with a cumulative total on those trips of over 30 million lbs. (14,000 mt).

Table 4 compares the catch that occurred on trips landing greater than 200,000 lbs. to total landings by vessel size class (Table 1). Not surprisingly, larger vessels catch a greater percentage of their Western GOA pollock on trips that would be curtailed by lowering the trip limit.

[3] https://alaskafisheries.noaa.gov/sites/default/files/goaplcks.pdf

Table 3 Number of Western GOA pollock trawl trips with landings greater than 200,000 lbs., and total pollock landings (mt) from those trips, by vessel size (2013 – 2017)

	# Trips with > 200k lbs. pollock landings				
	> 60' LOA	< 60' LOA	Total	% > 60' LOA	% < 60' LOA
2013	13	9	22	59%	41%
2014	5	6	11	45%	55%
2015	10	33	43	23%	77%
2016	114	50	164	70%	30%
2017	100	30	130	77%	23%
	Total landings (mt) from > 200k lbs. trips				
	> 60' LOA	< 60' LOA	Total	% > 60' LOA	% < 60' LOA
2013	1,577	1,006	2,583	61%	39%
2014	617	717	1,334	46%	54%
2015	1,092	3,562	4,654	23%	77%
2016	14,487	5,532	20,019	72%	28%
2017	12,908	3,551	16,459	78%	22%

Source: Catch Accounting data.

Table 4 Percent of total catch that occurred on Western GOA pollock trawl trips that landed > 200k lbs.

	> 60' LOA	< 60' LOA
2013	53%	23%
2014	39%	7%
2015	73%	13%
2016	91%	12%
2017	94%	19%

1.3 Chinook salmon PSC

This section describes recent Chinook salmon PSC levels and PSC rates in the Western GOA. PSC rates represent the number of Chinook salmon per mt of groundfish basis weight. Where rates are concerned, this paper relies on data from trips that carried an observer. Because observer coverage levels have changed substantially since 2013 in the Western GOA – and in the GOA more generally – this paper uses only the years since the observer program restructuring. During the 2013 to 2017 time period, roughly 200 Western GOA pollock trawl trips carried an observer.

Table 5 provides a count of Chinook salmon PSC attributed to Western GOA pollock trawl trips from 2013 to 2017. The 58' LOA fleet accounted for the majority of Chinook salmon PSC, but also accounted for 75% of pollock landings (Table 1). Over the course of all five years, the percentage of PSC that occurred on observed trips relative to unobserved trips was roughly equivalent. The higher percentage of observed PSC on larger vessels during 2013 fits with the history of the restructured observer program, which selected trips based on vessel size in the earlier years but now selects based on gear type (e.g. trawl, pot, hook-and-line – with additional selection strata based on whether or not a CV is delivering shoreside or to a tender vessel). Figure 2 shows a comparison of PSC rates between the 58' class of pollock trawl CVs and the larger vessels, depicting only data from the subset of trips that were observed. The figure aggregates 2013 through 2017 data across week-ending dates. The figure focuses on the C/D

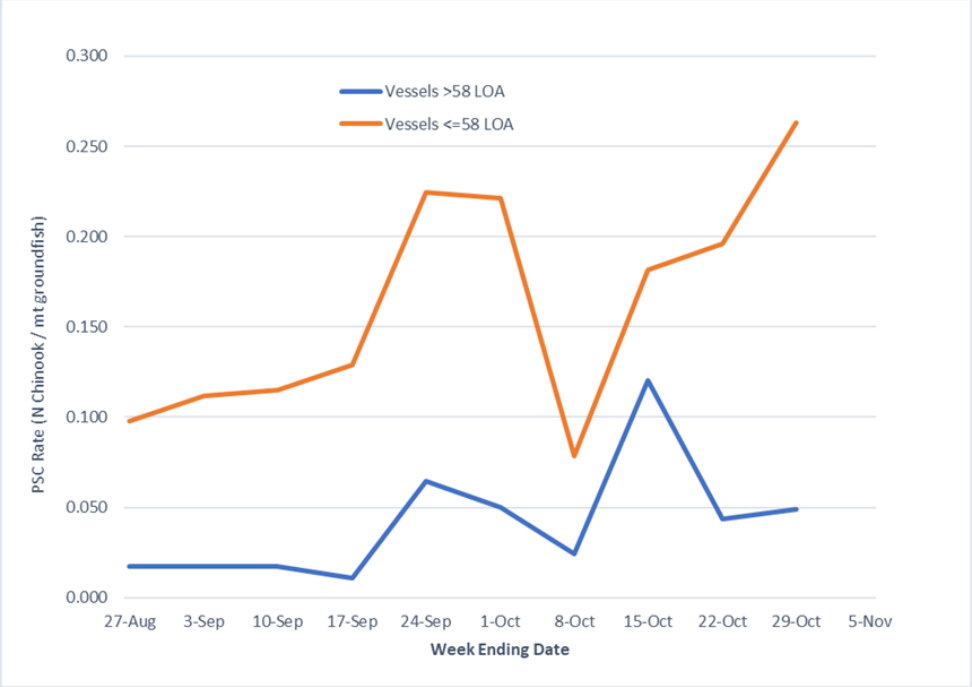
seasons, which is when the fleet is most active and when Chinook PSC rates are thought to increase. Indeed, the figure does show an upward trend in PSC rates for both vessel size classes as the season progresses. While many factors play into Chinook salmon encounter rates, it is worth noting that the smaller class of trawl vessels less often uses salmon excluder net designs. Those contacted approximated the number of 58' CVs using excluders around two, of the roughly 20 that participate in the Western GOA pollock trawl fishery.

Table 5 Western GOA pollock trawl Chinook salmon PSC, by vessel size on observed/unobserved trips

		Chinook salmon PSC			
Vessel Size	Year	Unobserved	Observed	% Obs.	Total
<60	2013	179	27	13%	206
	2014	2,435	410	14%	2,844
	2015	3,185	756	19%	3,942
	2016	3,193	1,410	31%	4,603
	2017	3,373	1,024	23%	4,397
< 60 Total		12,365	3,626	23%	15,992
>60	2013	448	918	67%	1,366
	2014	272	25	8%	298
	2015	161	17	10%	178
	2016	1,265	120	9%	1,386
	2017	2,566	125	5%	2,690
> 60 Total		4,712	1,205	20%	5,917

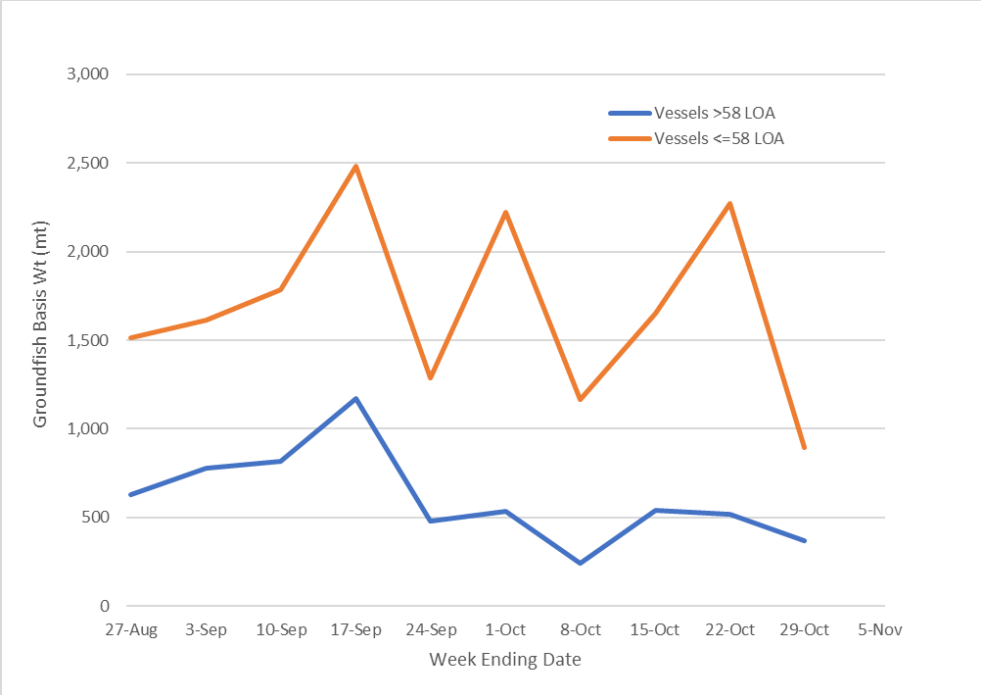
Source: Provided by AKFIN from Comprehensive_PSC data.

Figure 2 Chinook PSC rate on observed trips for the Western GOA pollock trawl C/D seasons, by vessel length (2013 through 2017)



Source: AKFIN data from Comprehensive_PSC.

Figure 3 Groundfish basis weights for Western GOA Chinook salmon PSC rates in Figure 2



Source: AKFIN data from Comprehensive_PSC.

Table 6 shows the incidence of Chinook salmon PSC on observed Western GOA trips with various size pollock landings. While all pollock trips that deliver shoreside have Chinook PSC accounted for by a census sample, trips that deliver to tenders are basket sampled. Relying on data from observed trips reduces the effect of any extrapolation from observed tender trips to unobserved tender trips. Drawing on roughly 200 observed trips, the data in Table 6 are probably not sufficient to declare a position on whether "smaller" trips have a higher or lower incidence of Chinook salmon encounter. High levels of Chinook PSC on lower-volume trips could reflect the characteristics of smaller vessels and/or the areas that they fish, but they could just as likely reflect the fact that any vessel encountering a high rate of Chinook salmon will curtail its trip so as not to jeopardize the remaining part of the season by hitting the fishery-wide Western GOA pollock trawl Chinook salmon PSC limit.

Table 6 Chinook salmon PSC taken on observed Western GOA pollock trawl trips, by pounds of pollock landed (2013 – 2017)

Pollock Landings	Chinook PSC (# fish)				
(1000s lbs.)	2013	2014	2015	2016	2017
0-50	893	74	96	58	68
50-100	8	215	113	234	302
100-150	36	114	236	560	91
150-200	0	32	217	295	309
200-250	0	0	95	271	19
250-300	0	0	4	74	37

Source: AKFIN data from Comprehensive_PSC.

Table 7, Figure 4,

Figure 5 fit together to make a comparison of Chinook salmon encounter and Chinook PSC rates across subareas of the Western GOA pollock fishery. This data is meant to be read in the context of earlier statements that the fleets fishing in the eastern and western portions of 610 generally – but not strictly – vary in terms of size, horsepower, and excluder use. Recognizing the uncertainty about the environmental factors that drive Chinook PSC rates, this information is also presented with the unconfirmed hypothesis that encounter rates might vary across geographical locations.

As Figure 1 showed earlier, pollock trawl fishing in the Western GOA occurs in a few distinct areas. In the eastern portion of 610, vessels fish around Sand Point and King Cove, around the Shumagin Islands, and on the Sanak Bank. Those areas are captured in Figure 4 (Bins 1 and 2). To the west, vessels fish around Akutan and on the Davidson Bank, shown in

Figure 5 (Bin 3). Over the 2013 to 2017 time period, 202 pollock trawl trips that carried an observer occurred in 25 different ADFG statistical areas within Area 610. Those trips yielded an estimated 4,727 Chinook salmon and 16,950 mt of groundfish for a PSC rate of 0.279. (Chinook salmon reported from observed trips is still estimated as the catch accounting system extrapolates basket samples to the haul level, and then to the trip level.)

Observed trips from this time period show a trend of higher PSC rates as activity moves from west to east, with the highest rates occurring between west longitudes 159 and 161 degrees (Bin 1). Twelve of the 25 ADFG statistical areas covered in Figure 4 and

Figure 5 occur in Bin 1. All 12 of those areas are among the 15 highest area-PSC rates. Bin 3 includes six ADFG statistical areas where observed trips occurred, and five of those six areas are among the eight lowest area-PSC rates.

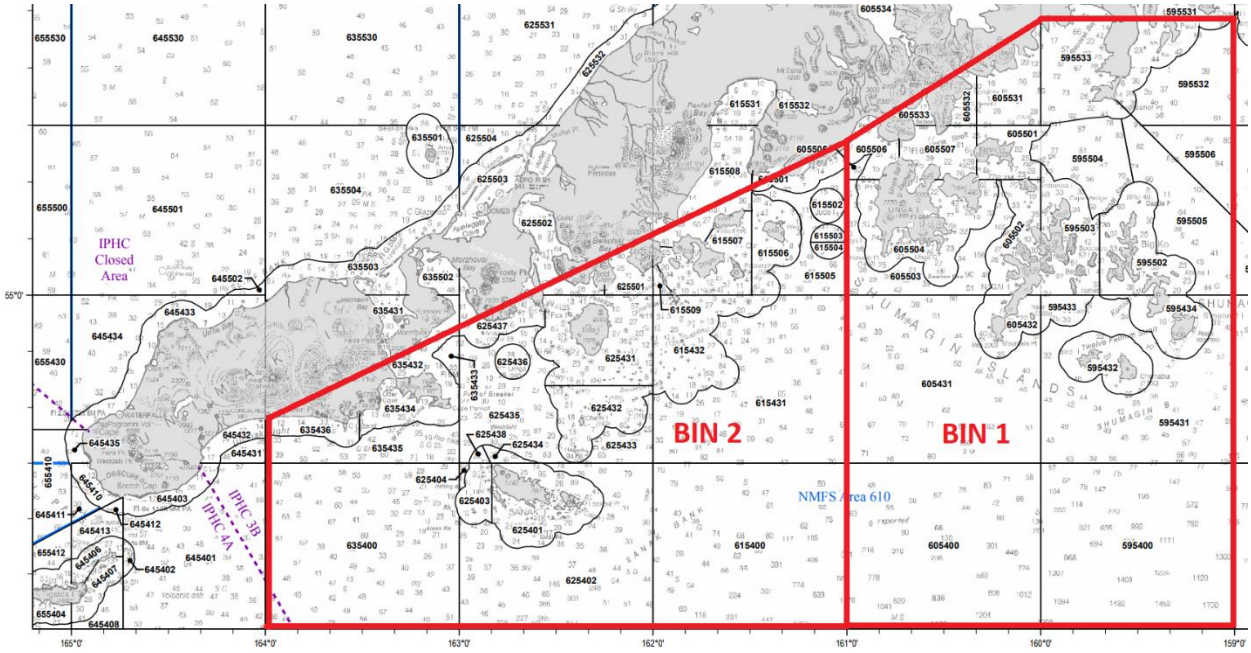
Table 7 PSC and PSC rates by area on observed pollock trips, 2013 – 2017 (BIN refers to drawn areas in Figure 4 and

Figure 5)

		Estimated Chinook PSC	Groundfish Wt. (mt)	PSC rate
BIN 1	Shumagin	4,182	9,757	0.429
BIN 2	Sand Pt/King Cove	120	609	0.197
BIN 3	Akutan/Davidson Bk.	425	6,585	0.065
Total		4,727	16,951	0.279

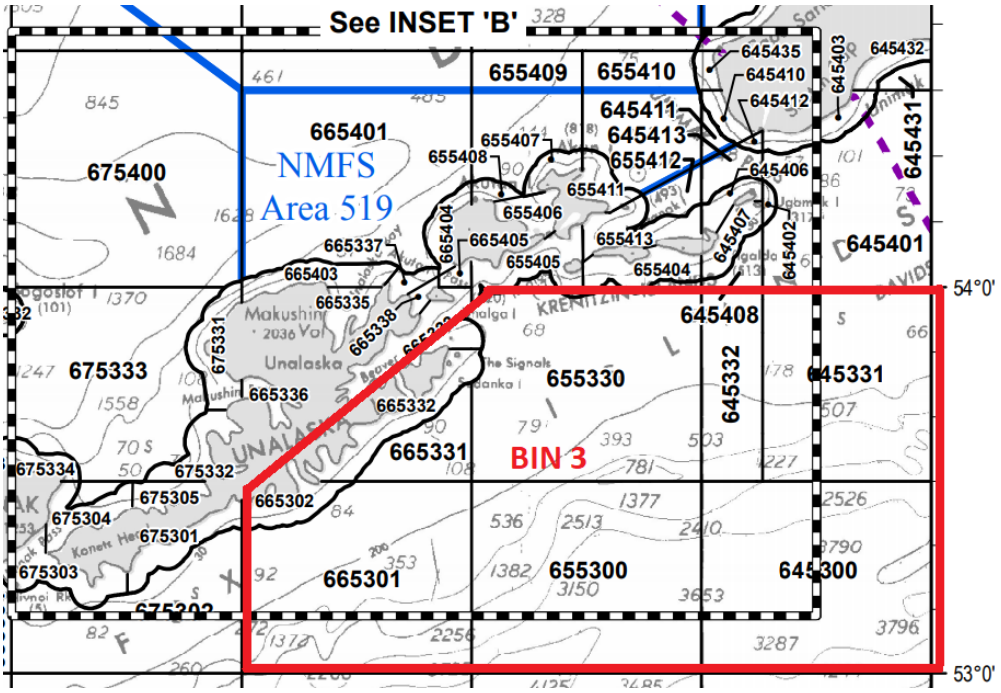
Source: NMFS AFSC Observer Program sourced through NMFS AKR, data compiled by AKFIN in Comprehensive_OBS.

Figure 4 ADFG statistical areas where observed Western GOA pollock trawl trips occurred (2013 – 2017) between 159 W long. and 164 W long.



Source: http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/chart09_akpenn_chignik.pdf

Figure 5 ADFG statistical areas where observed Western GOA pollock trawl trips occurred (2013 – 2017) between 164 W long. and 167 W long.



Source: http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/chart10_ai.pdf

1.4 AFA vessel participation in the Western GOA pollock trawl fishery

Trawl CVs that would eventually become part of the Bering Sea AFA pollock fleet accounted for a large proportion of Western GOA pollock catch in the 1990s. Table 8 through Table 11 show that their collective participation in the GOA has declined from those levels, even though the AFA sideboard allows non-exempt vessels to catch up to 60.47% of the Area 610 TAC in any given season.[4] Presumably, AFA vessels are electing not to fish their sideboard in the Western GOA because of the area-exclusivity regulations described in Section 1.1 of this paper. A vessel that fishes GOA pollock in the A/B season may not fish for pollock in the BSAI until the fall, and a vessel that fishes in the C/D season may not fish in the BSAI until January 20 of the following year. Forgoing pollock opportunities in the BSAI has proven too high a cost for vessels to compete for a portion of the Western GOA pollock TAC. Those regulations and sideboards for non-exempt AFA CVs developed as the Council sought measures to limit spillover effort from a rationalized fishery into the GOA limited access fishery, and as 58' salmon seiners expanded into the trawl gear fishery. For larger-capacity vessels, the establishment of the 300,000 lb. trip limit in 1999, and its strengthened application in 2008, also likely influenced the decision to forgo GOA fishing.

Table 8 Western GOA (Area 610) pollock fishery participation (vessels) by AFA/non-AFA, 2008 - 2017

Season	Year	Non-AFA	AFA	Total	Season	Year	Non-AFA	AFA	Total
A	2008	14	1	15	B	2008	8	1	9
	2009	15		15		2009	15	2	17
	2010	17	3	20		2010	16	3	19
	2011	9		9		2011	20		20
	2012	11	1	12		2012	19		19
	2013	13	1	14		2013	16	4	20
	2014	6		6		2014	16		16
	2015	1		1		2015	12		12
	2016	17	2	19		2016	8	1	9
	2017	9		9		2017	6		6
C	2008	10	1	11	D	2008	12	2	14
	2009	16	3	19		2009	16	2	18
	2010	18	2	20		2010	18	2	20
	2011	15	1	16		2011	19	1	20
	2012	23	1	24		2012	21	1	22
	2013	5	3	8		2013	9	2	11
	2014	18	2	20		2014	11		11
	2015	18	1	19		2015	15	1	16
	2016	26	1	27		2016	25		25
	2017	24	1	25		2017	27	1	28

[4] Seventeen AFA CVs are exempt from GOA sideboards, but are still subject to stand down and seasonal exclusivity regulations when moving between BSAI and GOA trawl fisheries.

Table 9 Western GOA (Area 610) pollock harvest by AFA/non-AFA, 2008-2017

Year	Non-AFA	AFA
2008	96%	4%
2009	93%	7%
2010	85%	15%
2011	93%	7%
2012	90%	10%
2013	66%	34%
2014	93%	7%
2015	98%	2%
2016	94%	6%
2017	93%	7%
Total	92%	8%

Table 10 Western GOA (Area 610) seasonal pollock harvest by AFA/non-AFA, 2008-2017

Season	Non-AFA	AFA
A	86%	14%
B	92%	8%
C	91%	9%
D	94%	6%
Total	92%	8%

Table 11 shows cumulative harvest by the AFA vessels that participated in the Western GOA pollock fishery from 2013 through 2017, and catch as a percentage of the cumulative sideboard limits for non-exempt AFA vessels fishing GOA pollock. The data are shown aggregated across years because fewer than three AFA vessels fished for Western GOA pollock in every season since 2013, with the exception of the 2013 B and C seasons (four vessels and three vessels, respectively). The catch shown in the table is for any AFA-affiliated trawl vessel, and not necessarily screened for exempt/non-exempt status. AFA vessels caught more than 50% of their sideboard in only one season dating back to 2013, and caught greater than 25% only twice. There was zero activity by AFA vessels in eight of the 20 seasons that are captured in the table.

Table 11 AFA catch (mt) of Western GOA (Area 610) pollock TAC relative to AFA non-exempt sideboard limits, cumulative over 2013 through 2017

	A	B	C	D
TAC	18,783	18,781	79,154	79,154
AFA Sideboard	11,358	11,356	47,864	47,834
AFA Catch	1,031	1,859	5,754	2,350
% Sdbd. Caught	9%	16%	12%	5%

2 Policy Considerations

2.1 Steller sea lion protection measures

If the Council considers an action to change pollock trip limits in the Western GOA, it should first consider whether such an action would trigger consultation under the Endangered Species Act (ESA) because of the potential effect on Steller sea lions. The Council should be aware that an ESA consultation is not necessarily limited to a particular management question, and would look at the full range of existing management measures that might affect listed Steller sea lion stocks. An appendix to this discussion paper

provides an outline of the consultation process and potential outcomes. While protected resources staff have not officially reviewed this issue, it would seem that reducing the trip limit only further spreads out the pollock fishery over time, which would be in keeping with the original direction of sea lion protection measures. However, the review that would occur if the Council proposes action would also consider whether reducing the trip limit has the unintended consequence of concentrating trawl effort in fewer spatial areas, and whether that poses any concern in regards to local depletion of marine mammal prey species.

2.2 Minimizing Chinook salmon PSC

The Council should be clear about whether it is considering a trip limit action as a tool to minimize Chinook salmon PSC, as stated in the December 2016 motion, or as a tool to manage effort and participation in the fishery. Lowering trip limits falls into the category of "input controls," similar to mesh size restrictions or limits on season length. Input controls are not universally regarded as a clear means to reduce encounters with rare bycatch species. Recognizing that there is a relatively short history of observed Western GOA trawl effort to draw from, Table 6 in this paper does not suggest a strong relationship between the amount of groundfish landed on a trip and the amount of Chinook salmon PSC.

The effect of "slowing down" the fishery on Chinook PSC levels is not obvious. Slowing down the fishery through input controls is not fully equivalent to slowing down the fishery through output controls (i.e., catch allocation) that allow participants to choose the most optimal time to fish, given their constraints (season dates and PSC limits). To the positive, vessels that encounter Chinook PSC would have less of a disincentive to stop fishing because they would be forgoing fewer additional fish that could have been landed on that trip. That said, the nature of trawling is such that a vessel does not know whether it has encountered Chinook until it hauls its net onboard, so the unit of decision-making for a captain is whether or not to make *another* haul. Given the unpredictable incidence of salmon and the methods by which total Chinook encounters are estimated, choosing not to make another haul after turning up salmon in a basket sample is not an effective prevention strategy because the "damage" has already been done. Moreover, Chinook salmon hard caps that can close down the fishery already provide captains with an incentive to stop fishing in the confirmed presence of salmon.

The management goal to approach optimum yield suggests that the Council should encourage the fleet's ability to fully harvest the TAC. If that is the case, one should expect more trips to occur under a lower trip limit. Incentivizing vessels to take additional trips has two obvious effects: (1) vessels will fish longer throughout the season (or else forgo catch), and (2) vessels will have to leave and return to fishing grounds more times. Fishing longer into the season could create conflicts for multi-fishery vessels that wish to move on to other fisheries (e.g., Federal trawl cod in February, or state-waters cod pots in March). Fishing longer into the D season pushes effort into a time of year that is suspected to have higher PSC rates (Figure 2). A slower paced fishery might also require the fleet to start the C season on or near its August 25 opening, which might conflict with targeted salmon fishing/processing in some years. To the latter point, because Chinook salmon are a rare and unpredictable bycatch species, the probability of encounter in an area is difficult to predict in advance, but can be observed and reacted to in the short-term. Lower trip limits might force a vessel that is experiencing "clean" fishing to leave the grounds to make a delivery and then reassess the bycatch situation upon its return for a subsequent trip – and doing so by using the blunt assessment tool of making a trawl haul. In that sense, a lower limit reduces the fleet's ability to concentrate harvest in time and space when Chinook salmon encounters have a known lower probability.

If vessels are fishing more, shorter trips throughout a season to reach the TAC, then it becomes more costly to take stand downs when PSC encounters are reported to be high. It would also be more difficult

to get the fleet to stand down voluntarily when the PSC rate that is being applied to unobserved effort is high. Currently, vessels might choose not to fish when the rate used to estimate bycatch has spiked. Increasing the cost of making that choice could incentivize vessels to keep fishing, thus raising the likelihood of hitting the PSC hard cap and causing a fishery closure that has broader socioeconomic effects.

Stakeholders have suggested that a lower trip limit could reduce the incidence of fishing at night, which might reduce PSC rates. The analysts do not have access to solid information with which to compare PSC rates during night-time and day-time, though that might be an area for further study. Regardless, it is not obvious that the level of the trip limit (300,000 lbs.) directly causes captains to fish at night, and that night-fishing would cease under a lower limit. The analysts presume that at-sea decisions are already largely based on whether or not the captain expects to encounter salmon in a haul, with the main motivating factor being the fleet's annual PSC hard cap. If it is true that Chinook encounters are higher at night, then incentives are already in place to dissuade that activity.

As discussed below, lower trip limits might reduce profitability for larger vessels. As it regards PSC, if the composition of the fleet shifts more towards the 58' LOA class then one would expect more catch to occur on platforms that are less likely to use excluders and that have displayed higher PSC rates in recent years (Figure 2). Aside from excluder use, towing speed, and randomness, the most likely explanation for persistent PSC rate differences between large and small trawlers is fishing area. Table 7 and the related figures provide a simple attempt to describe the rate differences that we have observed with only five years of reliable observer data. That exercise does not *prove* that intrinsic PSC rates are higher in the eastern portion of Area 610, merely that higher rates have been observed. The higher rates could be a function of the area, the vessels that fish there, or both.

2.3 Effects on harvest and delivery

The Western GOA pollock TAC is not fully harvested every year (Table 2), so it is unfair to say that a lower trip limit would directly reduce total harvest. However, an indirect mechanism by which the trip limit could affect total harvest is by increasing the risk of the fishery closing due to PSC. As noted above, increasing the number of trips that occur *might* increase the probability of a lightning-strike PSC event in a basket sample. At the least, the limit reduces the fleet's ability to maximize harvest when fishing is clean. Another risk factor is the capped rollover of uncaught pollock TAC from one season to the next. Larger TAC apportionments to the C and D seasons in recent years, combined with a slower paced fishery, could increase the amount of uncaught TAC.

Setting aside PSC, it is possible that a lower trip limit would make the fishery less appealing to larger vessels that would be underutilizing their hold capacity.[5] It is possible, but not assured, that these vessels would choose not to participate. To the extent that larger and smaller trawl CVs tend to deliver to different ports, a further shift towards a 58' fleet has other distributional impacts. In the extreme, if reduced deliveries to processors in the western parts of Area 610 made it uneconomical to run the plants at certain times of year, vessels that still wish to participate would need to rely on tenders and/or seek markets in Sand Point or King Cove. Future analysis would look more closely at processing capacity at different points during the pollock season, noting that congestion at smaller markets could affect all boats that remain in the fleet if processors have to further restrict the number of trips or size of deliveries that vessels can make.

[5] By comparing Table 1 and Table 8, it is apparent that most Western GOA pollock trawl vessels greater than 60' LOA are *not* AFA-affiliated. Most would be homeported in Kodiak or the Pacific Northwest.

Regardless of vessel size, reducing the trip limit would directly affect the cost profile of the fishery and thus net profitability. The cost of fuel and other variable production factors would increase relative to trip revenue. This negative effect would exacerbate a trend that is already ongoing, where the long-term cost of fuel is likely to grow more quickly than the value of a pound of pollock. Higher costs also affect crew members who are paid based on net revenue shares. Moreover, crew members taking more trips to catch the same amount of pollock would see a reduction in the productivity of their labor.

2.4 Management and safety

While the effect of lower trip volumes on PSC management is unclear, they might make fishery management marginally easier. As described in Section 1.2, NMFS has to contend with low seasonal TACs in the Western GOA A and B seasons. This sometimes results in preemptive closures if effort that is projected to occur over a weekend is greater than the quota remaining. Reducing trip limits would directly reduce projected catch capacity. NMFS faces a similar management challenge near the end of the C and D seasons if the TAC is going to be fully caught. Depending on the level of Chinook salmon taken in a given year, NMFS might also be managing the fishery to prevent hitting the 6,684 Chinook PSC hard cap. In each of these situations, NMFS tries to provide additional trips by working with the fleet if they can agree to self-limit harvest. Reducing the trip limit by 33% likely makes this process easier, but the degree of difference that it makes is not measurable.

Many of the vessels in the Western GOA trawl fishery have hold capacities that are less than 300,000 lbs., including most if not all of the 58' fleet. Nevertheless, it is reported that smaller vessels can achieve a trip over 200,000 lbs. – if not a full cap – by towing a codend in addition to filling its fish hold. (Information on vessel capacities is not collected, so the analysts can only look at the size of the largest delivery made by a vessel.) Presumably, towing a codend increases safety risks. In that sense, reducing the trip limit would allow vessel operators to make safer decisions without suffering as great a competitive disadvantage in a derby-style fishery based on their vessel's size.

3 Preparers and Persons Consulted

Jim Armstrong	NPFMC Staff
Sam Cunningham	NPFMC Staff

Contributors

Mike Fey	AKFIN
Bridget Mansfield	NMFS AKRO SF
Steve MacLean	NPFMC Staff

Agency Persons Consulted

Mary Furuness	NMFS AKRO SF
Josh Keaton	NMFS AKRO SF
Brandee Gerke	NMFS AKRO SF
Krista Milani	NMFS AKRO SF
Trent Hartill	ADF&G

Others Consulted

Tom Evich	F/V Karen Evich
Kiley Thompson	F/V Decision
Nicole Kimball	Pacific Seafood Processors Assn.
Julie Bonney	AK Groundfish Data Bank

Hunter Berns	Icicle Seafoods
Brent Paine	United Catcher Boats
Ruth Christiansen	United Catcher Boats
John Gruver	United Catcher Boats

Appendix: ESA Section 7 Consultation Process Outline

- Under the ESA Federal agencies have a mandate to conserve listed species and Federal actions, activities, and authorizations (Federal actions) must be in compliance with the provisions of the ESA. Section 7 of the ESA provides a mechanism for consultation by the Federal action agency with the appropriate consulting agency (NMFS or USFWS).
- NMFS would not initiate an ESA section 7 consultation on a suite of alternatives for a proposed action, but could initiate consultation once the Council has identified a preferred alternative and takes final action on an issue.
- Once the Council has taken final action on an issue, NMFS AKR Sustainable Fisheries Division would prepare a biological assessment to determine if the proposed action would adversely impact the listed species or adversely modify critical habitat. The biological assessment contains an analysis based on biological studies of the likely effects of the proposed action on the species or habitat.
- Informal consultations are conducted for Federal actions that are believed to have no adverse effects on the listed species, nor destroy or adversely modify its designated critical habitat.
- Formal consultations, resulting in biological opinions, are conducted for Federal actions that may have an adverse effect on the listed species.
- Through the biological opinion, a determination is made about whether the proposed action poses "jeopardy" or "no jeopardy" of extinction or adverse modification or destruction of designated critical habitat for the listed species.
- If the determination is that the proposed or on-going action will cause jeopardy or adverse modification of critical habitat, reasonable and prudent alternatives may be suggested that, if implemented, would modify the action to no longer pose the jeopardy of extinction or adverse modification to critical habitat for the listed species. These reasonable and prudent alternatives must be incorporated into the Federal action, if it is to proceed.
- A biological opinion with the conclusion of no jeopardy or adverse modification of critical habitat may contain conservation recommendations intended to further reduce the negative impacts to the listed species. These recommendations are advisory to the action agency (50 CFR 402.14(j)). If the likelihood exists of any take[6] occurring during promulgation of the action, an incidental take statement may be appended to a biological opinion to provide for the amount of take that is expected to occur from normal promulgation of the action. An incidental take statement is not the equivalent of a permit to take a listed species.

[6] The term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 U.S.C. § 1532(19)).

Appendix: Description and status of Steller sea lion populations

Steller sea lions (*Eumetopias jubatus*) in Alaska are currently managed as two distinct population segments. Before 1997, Steller sea lions in Alaska were managed as a single population and were listed as threatened under the Endangered Species Act (ESA) in 1990. New genetics information revealed further population structure, with the eastern and western population segments delineated at Cape Suckling, 144 deg. west longitude (Figure 6). In 1997, NOAA scientists recognized two distinct population segments and listed the western DPS as endangered, while the eastern DPS remained listed as threatened. In 2013, NOAA Fisheries concluded that the eastern DPS of Steller sea lions had recovered and the population was removed from the list of threatened species. The western DPS remains listed as endangered. The ESA requires management at the species or population segment level, in this case the Eastern and Western DPS, and the Recovery Plan for the Steller Sea Lion recognizes those distinct eastern and western population segments. The Recovery Plan identified a series of Recovery Criteria that must be met to consider downlisting (Endangered to Threatened) or delisting (removed from the list) either DPS.

To consider **downlisting** the western DPS, the following conditions must be met:

1. The population in the US region has increased (statistically significant) for 15 years on average;
2. The trends in non-pups in at least 5 of the 7 sub-regions are consistent with the trend under condition 1. The population trend in any two adjacent sub-regions cannot be declining significantly.

The second condition is problematic for the downlisting the western DPS. The western Aleutian sub-region is declining significantly; the central Aleutian population is also declining or stable; the eastern Aleutian and Bering Sea sub-region is stable, or increasing. So, until at least 5 of the 7 sub-regions are increasing statistically significantly, with no two adjacent sub-regions declining significantly, the western DPS cannot be considered for downlisting.

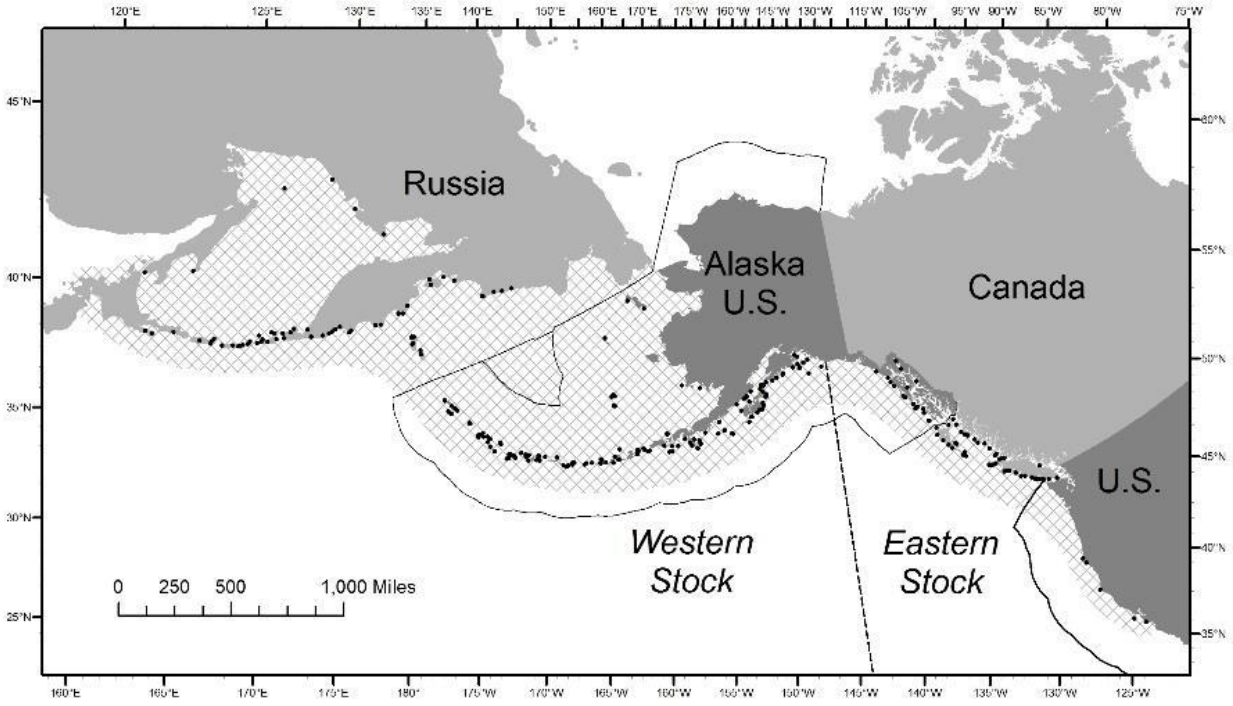
Also note that if a DPS is downlisted from endangered to threatened critical habitat designation and protection measures are still required.

To consider **delisting** the western DPS the following conditions must be met:

1. The population in the US region has increased (statistically significant) for 30 years (at an average annual growth rate of 3%);
2. Trends in non-pups in at least 5 of the 7 sub-regions are stable or increasing, consistent with the trend observed under criterion 1. The population trend in any 2 adjacent sub-regions cannot be declining significantly. The population trend in any sub-region cannot have declined by more than 50%.

The western Aleutian sub-region is very near, or has already surpassed a 50% decline, so until that population has increased considerably, the population will not be a candidate for delisting, even if the other criteria are met.

Figure 6 At-sea and breeding ranges (rookeries) of western and eastern DPS of Steller sea lions in the North Pacific Ocean. Source: Alaska Marine Mammal Stock Assessments, 2016, Muto et al. 2017.



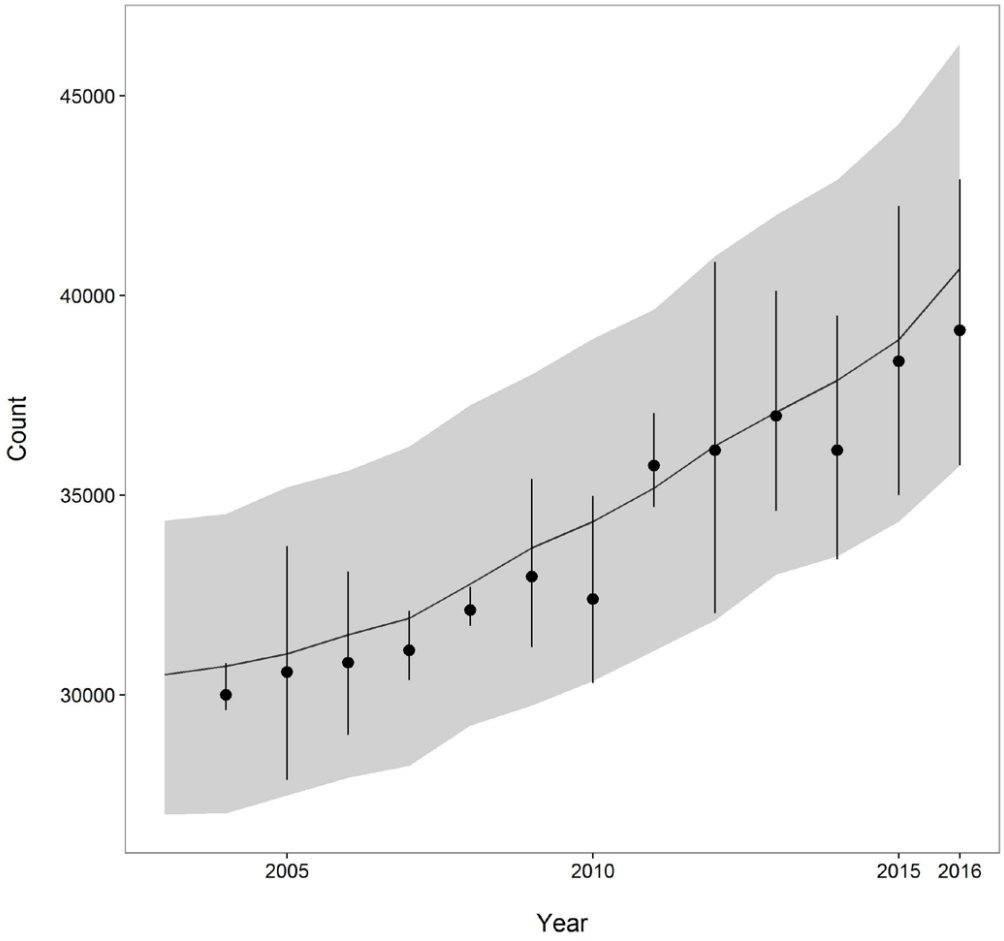
Population estimates

Two types of counts are used to study trends in Steller sea lion populations: counts of pups up to 1 month of age, and counts of non-pups (1+ year olds). NMFS monitors Steller sea lion status in Alaska by counting animals during the breeding season at trends sites in conjunction with the State of Alaska and other partners. Trend sites are a set of terrestrial rookeries and haulouts where surveys have been consistently undertaken for many years. The estimated ratio of pups to non-pups in Steller sea lion populations can be used to estimate population size. Population trend is calculated by plotting non-pup counts over time.

Western DPS

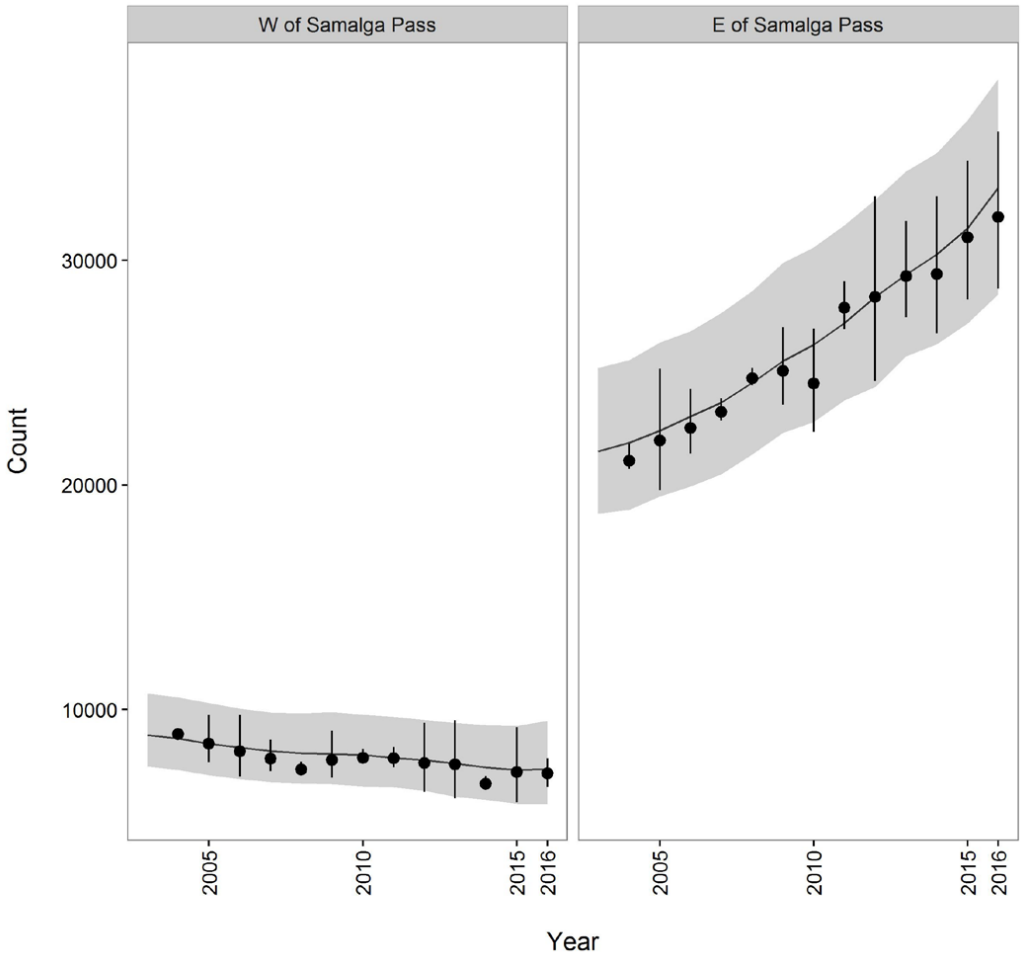
The western DPS of Steller sea lions declined from an estimated 220,000 to 265,000 animals in the late 1970s to fewer than 50,000 in 2000. Since 2000, the abundance in the western DPS has increased, overall (Figure 7), but there is considerable regional variation in trend. The most recent estimate of total western DPS population comes from surveys in 2014 and 2015, which resulted in a minimum population estimate of 50,983.

Figure 7 Counts of western Steller sea lion non-pups in Alaska, 2003-2016



The most recent survey of the western DPS of Steller sea lions was conducted in late June through mid-July 2016. A total of 21,969 live non-pups were counted on 117 sites, a total of 587 non-pups were counted in the western Aleutians. For the western DPS in Alaska overall, non-pup counts increased at 2.24% per year between 2003 and 2016. However, the regional pattern of western DPS non-pup count trends is similar to previous years' assessments: generally decreasing west of Samalga Pass and increasing to the east (Figure 8). Samalga Pass lies to the west of Umnak and Unalaska Islands, meaning that Western GOA trawl activity occurs in the eastern portion of the Western Steller sea lion DPS. Steep declines continued in the western Aleutian Islands (-6.94% per year). Because of the steep, significant declines in the western Aleutian Islands, the western DPS is not meeting its recovery goals and remains classified as endangered under the U.S. Endangered Species Act.

Figure 8 Trends of Steller sea lion counts west and east of Samalga Pass, Alaska, 2003-2016



Eastern DPS

The best available information indicates that the overall abundance of Steller sea lions in the eastern DPS increased for a sustained period of at least three decades, and pup production increased significantly, especially since the mid-1990s. Analysis of growth trends of the eastern DPS from 1979-2010 concluded that the eastern DPS increased from an estimated 18,313 animals in 1979 to an estimated 70,174 in 2010, which results in an estimated rate of growth of nearly 4.2% per year (Figure 9). Based on these rates of growth, and other criteria identified in the Steller sea lion Recovery Plan, the eastern DPS was delisted in 2013.

Figure 9 Estimated abundance of the eastern DPS of Steller sea lion, in subregions and in total, based on pup counts from 1979-2012