Discussion Paper: Groundfish Fishery Effort and Observer Coverage Relative to Statistical Areas of Interest for Tanner Crab in the Central Gulf of Alaska

May 25, 2018[1]

Contents

Executive Summary

After reviewing a discussion paper on direct and indirect protections for Tanner crab and Tanner crab habitat at the June 2017 NPFMC meeting, the Council directed staff to prepare this discussion paper that examines nonpelagic trawl and pot cod effort and observer program coverage in certain statistical areas around Kodiak Island, AK. In addition to that information, updates to Tanner crab abundance and prohibited species catch are provided.

In the 2006-2017 timeframe, nonpelagic trawl and pot cod effort are mostly without trend or decreasing in the areas examined. There appears to be an increase in deepwater flatfish effort in the Eastside management Section of the Kodiak District, but the increase is relative to a marked drop in effort in 2015. Fishery PSC continues to represent a very small proportion of Tanner abundance (less than 0.1% to 0.4%). Observer coverage within the specific statistical areas that the Council wanted to be reviewed are representative of total coverage in the Central Gulf of Alaska.

1 Introduction

At its June 2017 meeting in Juneau, AK, the Council reviewed a discussion paper[2] on the direct and indirect protections afforded to Tanner crab and Tanner crab habitat in the Central Management Area of

[1] Prepared by: Jim Armstrong, Council staff, and Cathy Tide, NMFS AKR
[2] http://npfmc.legistar.com/gateway.aspx?M=F&ID=dc2021e2-6b98-40ad-8a30-d367ba39f4cb.pdf

the Gulf of Alaska (CGOA). That paper also included ADF&G updates on Tanner crab abundance and distribution[3], harvest by the directed Tanner crab fishery[4], observer-based estimates of prohibited species catch (PSC) of Tanner crab in federally-permitted CGOA groundfish fisheries, and a brief discussion on observer coverage.

The 2017 discussion paper concluded that –

> *"The factors constraining crab stock recovery in the GOA are likely complicated. Through the accumulation of indirect protections, and finally through the direct protections put in place by the Council [through GOA Groundfish Amendment 895], Tanner crab in the CGOA are less affected by the activity of the groundfish trawl fleet than they would be in the absence of those measures. Nevertheless, it is not well understood how important trawl bycatch is relative to other factors in the environment that may be limiting recovery of the stock and resumption of a stable and profitable Tanner crab fishery. Areas south of Kodiak, specifically statistical areas 525702 and 525630 show concentrations of Tanner crab from the ADF&G survey, as well as a relatively high degree of groundfish gear use [Figure 8 in the discussion paper]. Since 2014, however, trawl gear modifications should be associated with reduced impacts to crab and crab habitat throughout the Central Gulf."*

The Council followed its review by directing staff[6] to prepare a further discussion paper to evaluate the following:

1. Review the Arrowtooth / Shallow Water Flats / Rex Sole / Flathead Sole Non pelagic trawl (NPT) target fisheries and the pot cod fishing efforts in ADF&G statistical areas 525702, 525630 and the Chiniak Gully from 2006-2016. Provide a time series to understand if the fishing effort is increasing.

2. Evaluate observer coverage rates in the ADF&G statistical areas 525702, 525630 and the Chiniak Gully from 2006–2016. Break out NPT in the CV sector, the trawl CP sector, the trawl Rockfish Program and the pot cod fishery coverage rates in each area referenced above.

1.1 Amendment 89 to the GOA Groundfish FMP

Direct protections to Tanner crab in the CGOA through Amendment 89 to the GOA Groundfish FMP have been effective since February 2014. Specific regulatory changes imposed by the amendment included a protection area in Marmot Bay, northeast of Kodiak Island (Figure 1); required use of modified nonpelagic trawl (NPT) gear when directed fishing for flatfish in the CGOA. Amendment 89 concluded that:

> *"The trawl sweep modification has proven to be effective in the BS flatfish fisheries at reducing unobserved mortality of crab from the trawl sweeps. It is also likely to provide protection to Tanner crab in the Central GOA flatfish fisheries. It is not possible to*

[3] http://www.adfg.alaska.gov/FedAidpdfs/FMR16-20
[4] http://www.adfg.alaska.gov/FedAidpdfs/FMR16-16
[5] https://www.federalregister.gov/documents/2014/01/16/2014-00780/fisheries-of-the-exclusive-economic-zone-off-alaska-tanner-crab-area-closure-in-the-gulf-of-alaska
[6] http://npfmc.legistar.com/gateway.aspx?M=F&ID=2cacb8e2-455c-487e-9e18-d6d55031c7ad.pdf

quantify a benefit to crab stocks in the Central GOA from modified trawl sweeps without further testing to understand how sediment conditions in the Central GOA flatfish fisheries compare to the areas in which BS experiments occurred. However, the general similarity of GOA trawl gear to that used in the BS indicates that while the benefits may be smaller, they would still be substantial. While requiring this modification for vessels fishing in the Central GOA flatfish fisheries could certainly provide benefit to crab stocks, by reducing unobserved mortality, it would not be likely to change reported PSC totals from trawl fishing, which account only for PSC brought onboard in the trawl net."

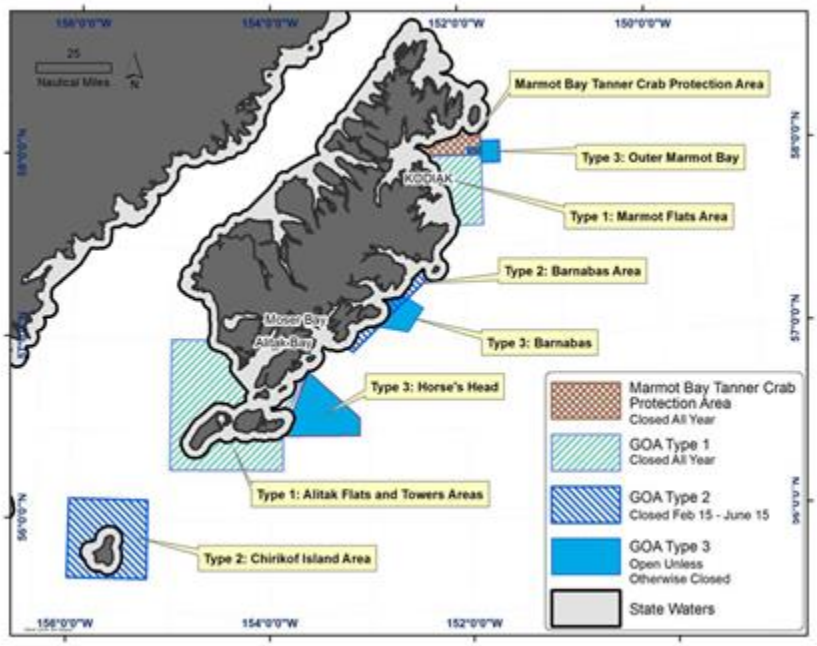

Figure 1. The Marmot Bay Tanner Crab Protection Area established through Amendment 89 as well as king crab closure areas around Kodiak island.

1.2 Tanner Crab Abundance Update

Tables 1 and 2 below provide Tanner crab abundance estimates for the Kodiak District. The largest survey catch continues to be from 2013. Propagation of the 2013 survey catch of very small/young crab (mostly approx. age 2-3, pers comm. Kally Spalinger) into recent survey catches of legal size crab is not as evident as might be expected. The 2017 survey catch of legal size male Tanner crab is the largest survey catch of legal crab since 2012, but the magnitude of the increase suggests that significant mortality events affected the strength of the large year class. Nevertheless, the survey catch was sufficient to allow for the Tanner crab fishery to be opened[7] for a harvest of 260,000 lb in the 2018 fishing year, the first time that has occurred since 2013.

[7] http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/877958472.pdf

Table 1. Kodiak District Tanner crab abundance estimates (all sizes) from 2003-2017. Source ADF&G Fishery Management Report 18-xx (Spalinger in press).

Year	Northeast	Eastside	Southeast	Southwest	Westside	North Mainland	Kodiak District
2003	13,363,472	32,406,665	5,982,213	3,080,161	4,639,203	6,812,450	66,284,164
2004	16,518,733	24,883,473	12,162,505	3,612,221	1,862,027	10,297,226	69,336,185
2005	17,380,317	18,446,367	10,915,692	2,990,901	3,947,639	13,117,630	66,798,546
2006	21,825,756	68,127,135	32,925,645	15,235,534	9,334,218	16,632,058	164,080,346
2007	18,525,668	98,322,733	35,220,673	25,713,488	4,582,398	3,345,073	185,710,033
2008	21,040,150	50,577,476	10,651,945	23,227,580	8,397,115	4,712,180	118,606,446
2009	17,120,959	35,807,628	7,741,181	9,477,794	5,623,343	5,259,416	81,030,321
2010	14,530,442	27,870,920	13,624,521	10,456,321	3,448,153	5,439,809	75,370,166
2011	5,117,339	20,080,961	7,970,276	2,919,897	2,829,697	15,800,131	54,718,301
2012	9,970,194	12,629,005	8,573,538	3,228,498	4,212,734	5,433,472	44,047,441
2013	52,895,931	64,737,959	29,861,087	39,382,443	5,769,909	8,383,239	201,030,568
2014	18,959,208	45,978,679	22,903,125	15,298,456	4,023,534	3,723,269	110,886,271
2015	4,052,897	13,038,638	4,452,675	6,948,431	2,418,936	8,575,005	39,486,582
2016	3,755,531	25,527,085	7,605,809	4,138,564	4,005,178	12,717,601	57,749,768
2017	8,680,255	26,708,842	21,402,556	3,138,881	4,560,623	4,709,876	69,201,033

Table 2. Kodiak District Tanner crab abundance estimates (legal-size males; ≥ 5.5in CW) from 2003-2017. Source ADF&G Fishery Management Report 18-xx (Spalinger in press).

Year	Northeast	Eastside	Southeast	Southwest	Westside	North Mainland	Kodiak District
2003	495,777	593,514	143,239	210,189	239,486	79,507	1,761,712
2004	1,018,239	1,452,887	311,351	1,341,858	187,762	85,402	4,397,499
2005	1,059,636	3,621,441	313,777	821,757	179,753	88,432	6,084,796
2006	242,624	2,680,581	305,893	727,392	329,622	177,417	4,463,529
2007	361,837	1,652,582	305,470	1,216,033	271,233	132,900	3,940,055
2008	315,285	1,119,393	153,204	381,686	263,184	146,447	2,379,199
2009	696,127	2,422,474	733,094	374,943	393,196	182,632	4,802,466
2010	805,717	4,670,212	1,595,485	1,215,191	293,211	86,702	8,666,518
2011	281,693	2,375,133	1,810,697	753,228	164,608	88,304	5,473,663
2012	209,087	2,655,144	909,934	562,267	138,422	286,775	4,761,629
2013	106,454	650,473	477,300	307,221	87,740	160,203	1,789,391
2014	140,348	290,233	1,226,755	126,530	105,649	73,091	1,962,606
2015	50,932	157,417	82,470	154,586	60,195	318,568	824,168
2016	55,482	489,469	184,372	87,439	64,969	92,144	973,875
2017	51,179	1,003,438	191,103	633,336	71,028	136,992	2,087,076

1.3 Tanner Crab PSC

Since impacts to Tanner crab from the trawl gear modifications were expected to be in the form of reductions in unobserved mortality, it is difficult to evaluate the effectiveness of the changes. Several flatfish target fisheries continue to dominate overall Tanner crab PSC in the CGOA following the effective date of Amendment 89 in Feb 2014. Table 3 shows the Tanner crab PSC estimates for NPT fisheries in the CGOA (2003-2018). These flatfish fisheries (arrowtooth flounder, shallow water flatfish complex, rex sole, and flathead sole; columns 2-5 in Table 1) comprise more than 92% of Tanner crab PSC for all CGOA NPT fisheries. The average total PSC has decreased since Amendment 89 was implemented (89,370 crab in 2014-2017 vs. 152,290 in 2003-2013).

PSC for the Pacific cod pot fishery (Table 4**)** is similar in magnitude to the overall NPT PSC and also shows a similar difference between pre- and post-2014 averages (81,926 crab in 2014-2017 vs. 159,502 in 2003-2013). Information in Tables 1 and 2 updates Tables 12 and 13 in the 2017 discussion paper. Note that pot cod PSC totals provided in Table 4 *do not* include PSC from the State-water GHL fisheries. Also note, these numbers reflect total catch, not total mortality; it is important to recognize that not all of the Tanner crab that were discarded would have died. Although the Catch Accounting System (CAS) does not apply mortality to species besides Pacific halibut, the Eastern Bering Sea Tanner Crab Stock

Assessment and Fishery Evaluation Report[8] assigns handling mortality rates of 80% for groundfish fisheries using trawl gear and 50% for groundfish fisheries using fixed gear. Neither bycatch nor directed harvest mortality are estimated for GOA Tanner crab since the State manages the GHL fishery based on the survey index alone.

Table 3. PSC estimates (number of crab) for species targets within the NPT gear group in the CGOA from 2003–2018. Horizontal line indicates periods before and after the effective date of Amendment 89 (Feb 2014). (Source AKRO Blend and Catch Reporting).

Tanner PSC (number of crab) for CGOA groundfish target fisheries

Year	ATF	SWF	Rex	Flathd	Pcod	Poll	All others	Total
2003	29,307	59,533	33,932	18,191	3,077	0	258	144,298
2004	33,512	8,700	9,030	7,514	1,161	555	2,097	62,569
2005	68,929	6,116	4,461	43,956	1,314	0	1,809	126,585
2006	88,825	33,844	73,528	25,887	742	7,744	1,000	231,571
2007	43,283	80,682	45,274	254	15,071	19,350	457	204,369
2008	35,468	24,119	48,018	6,788	19,376	1,669	661	136,100
2009	40,870	30,799	141,431	7,683	2,372	6,558	3,691	233,403
2010	46,414	21,515	14,267	6,060	2,610	87	3,168	94,122
2011	75,279	5,311	6,103	5,239	210	10,191	286	102,620
2012	72,998	3,781	0	3,124	5,532	357	207	85,999
2013	99,211	118,502	750	11,859	16,417	6,650	166	253,555
2014*	39,226	10,488	233	0	12,152	2,062	313	64,473
2015	6,811	62,254	81	3,225	1,144	2,216	93	75,824
2016	77,297	9,993	0	293	699	3,911	255	92,449
2017	109,308	9,301	1,211	0	756	2,936	1,222	124,734
2018**	15,242	54	19	0	0	187	146	15,647
Total	881,981	484,992	378,338	140,072	82,634	64,472	15,830	2,048,319

Target fisheries:
ATF arrowtooth flounder
SWF shallow water flatfish complex
Rex rex sole
Flathd flathead sole
Pcod Pacific cod
Poll walleye pollock
* Effective date of Amendment 89 Feb 2014
** PSC data as of May 3, 2018

[e] https://app.box.com/s/eq1gdh1rxlachjne45u4pirax7b4u2zu

Table 4. PSC estimates (number of crab) for pot cod in the CGOA from 2003 – 2018. Horizontal line indicates periods before and after the effective date of Amendment 89 (Feb 2014). (Source AKRO Blend and Catch Reporting).

Year	Tanner PSC (N) for CGOA pot cod
2003	13,036
2004	17,062
2005	116,083
2006	103,954
2007	304,761
2008	239,146
2009	34,336
2010	168,936
2011	21,237
2012	167,405
2013	568,561
2014*	133,201
2015	127,682
2016	62,744
2017	4,079
2018**	16,224
Total	2,098,446

* Effective date of Amendment 89 Feb 2014
** PSC data as of May 3, 2018

The number of Tanner crab taken as PSC in the NPT and pot fisheries (Tables 3 and 4) is consistently low relative to abundance estimates (Tables 1 and 2). Table 5 shows the ratios of Tanner PSC from the NPT and pot cod fisheries to Tanner crab abundance estimates for the CGOA.

Table 5. A comparison of Tanner Crab PSC estimates (number of crab) for the NPT gear group and Pot Cod in the CGOA with Kodiak District Tanner Crab Abundance Estimates (All Sizes).

	NPT PSC		Pot Cod PSC		Kodiak District Crab Abundance Estimates (All Sizes)
Year	**# Crab**	**% of Crab**	**# Crab**	**% of Crab**	**# Crab**
2003	144,298	0.2%	13,036	0.0%	66,284,164
2004	62,569	0.1%	17,062	0.0%	69,336,185
2005	126,585	0.2%	116,083	0.2%	66,798,546
2006	231,571	0.1%	103,954	0.1%	164,080,346
2007	204,369	0.1%	304,761	0.2%	185,710,033
2008	136,100	0.1%	239,146	0.2%	118,606,446
2009	233,403	0.3%	34,336	0.0%	81,030,321
2010	94,122	0.1%	168,936	0.2%	75,370,166
2011	102,620	0.2%	21,237	0.0%	54,718,301
2012	85,999	0.2%	167,405	0.4%	44,047,441
2013	253,555	0.1%	568,561	0.3%	201,030,568
2014*	64,473	0.1%	133,201	0.1%	110,886,271
2015	75,824	0.2%	127,682	0.3%	39,486,582
2016	92,449	0.2%	62,744	0.1%	57,749,768
2017	124,734	0.2%	4,079	0.0%	69,201,033

1.4 Observer Coverage in Amendment 89

As addressed in the 2017 discussion paper, enhanced observer coverage requirements were initially included as options leading up to Amendment 89. Specifically, in 2010, the Council recommended 100% NPT observer coverage and 30% pot coverage in statistical areas 525702 and 525630 and Chiniak Gully (Figure *2*) near Kodiak, AK. The intent was to improve estimates of Tanner crab bycatch data in the GOA groundfish fisheries. At the same October 2010 meeting, however, the Council also approved BSAI/GOA Amendments 86/76 to comprehensively restructure the funding and deployment of observers (i.e., Restructured Observer Program). Accordingly, the regulatory language for Amendment 89 accommodated the new observer deployment strategy.

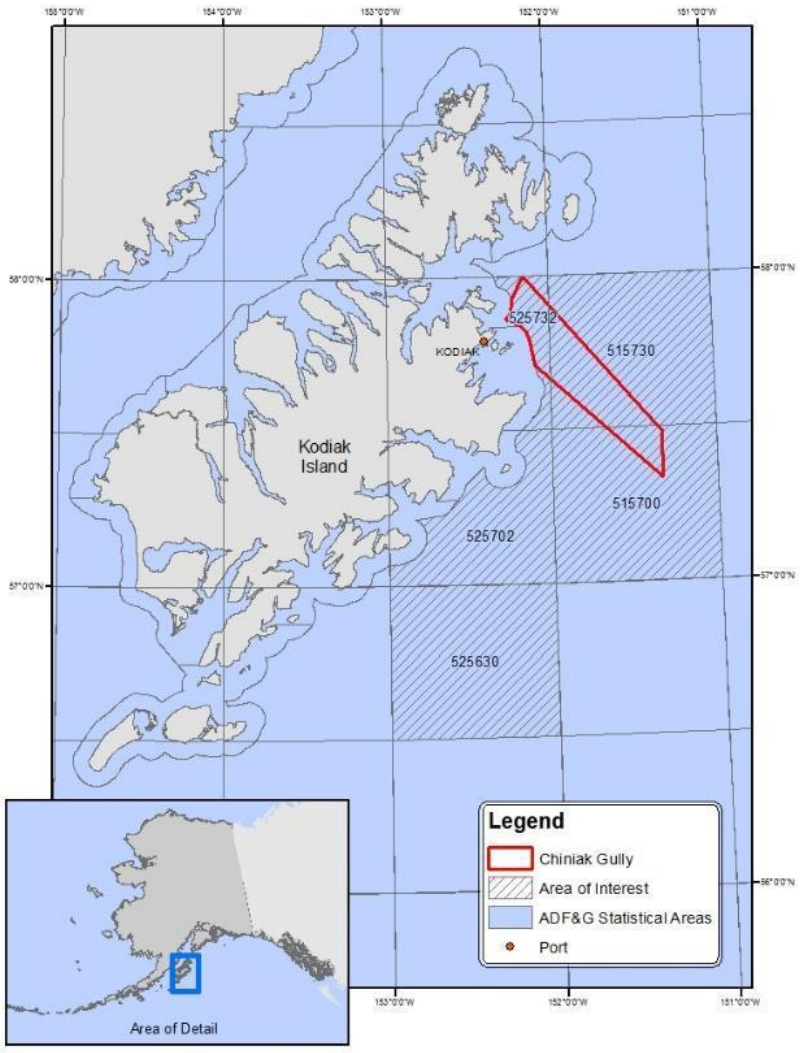

Figure 2. Statistical areas with relatively high Tanner crab PSC in CGOA flatfish trawl fisheries and identified as areas of interest for this analysis: 525630, 525702, and those associated with the Chiniak Gully (515700, 515730, and 525732).

2 Groundfish Target Fishery Effort in the Statistical Areas of Interest

The following sections identify fishing effort on both pot gear and non-pelagic trawl gear in ADF&G statistical areas 525630, 525702, and those associated with the Chiniak Gully (515700, 515730, and 525732) for the non-pelagic trawl flatfish targeted fisheries and the Pacific cod pot fishery during the 2006 through 2017 time-period.

Effort is expressed in the figures and tables below as total catch, number of unique vessels, and number of landings. A direct measure of effort such as standardized trawl tow duration was considered beyond the scope of this discussion paper. Number of trips is perhaps the closest thing to a direct measure of effort, but in order to impute effort from number of trips assumptions must be made about the stability of trip-level effort. This concern was partially addressed by looking at the average number of hauls per observed

trip as well as the predominant vessel size for the statistical areas of concern. The average number of hauls from observer data was approximately 4 tows and, although highly variable in 2008-2011, was fairly stable for the recent period (2012-2017; Figure 3). Additionally, effort by CVs in these statistical areas predominantly (90%) consisted of vessels 59-108 ft LOA.

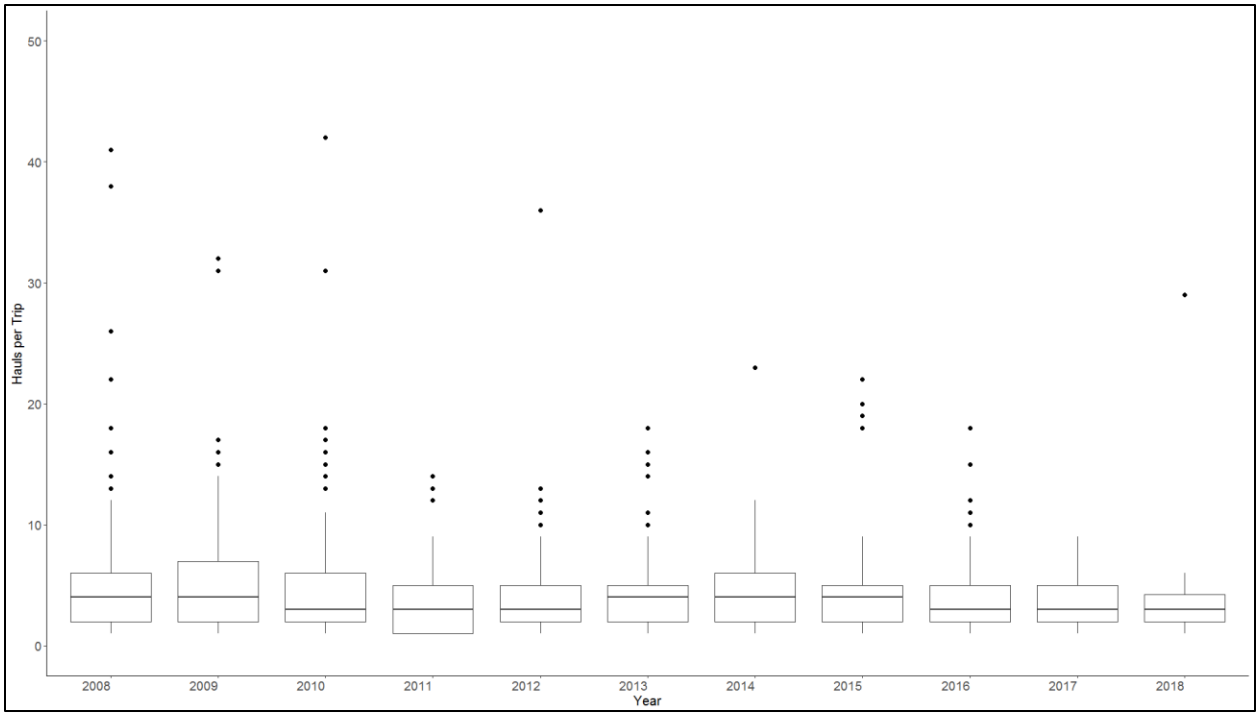

Figure 3. Average number of hauls for observed NPT flatfish trips in statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732) from 2008-2018. 13 trips with 50+ hauls not included.

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data

2.1 Fishing Effort in the Area for Pot Gear

Figures 4, 5, and 6 illustrate pot gear effort by target and area from 2006 through 2017. The areas are an aggregation of ADF&G statistical areas 525630 and 525702 or the three ADF&G statistical areas associated with the Chiniak Gully (515700, 515730, and 525732). These three areas were combined to ensure that confidential data would not be released. Total catch in the Pacific cod target has declined in areas 525630 and 525702 since 2012 and in the Chiniak Gully areas since 2011 (Figure 4). The number of unique vessels fishing in the Pacific cod target in areas 525630 and 525702 has fluctuated over this time-period and has seen an overall decline in the Chiniak Gull areas since 2006 (Figure 5). The number of landings with harvest from the Chiniak Gully areas peaked in 2011, coinciding with the peak in total catch (Figure 6).

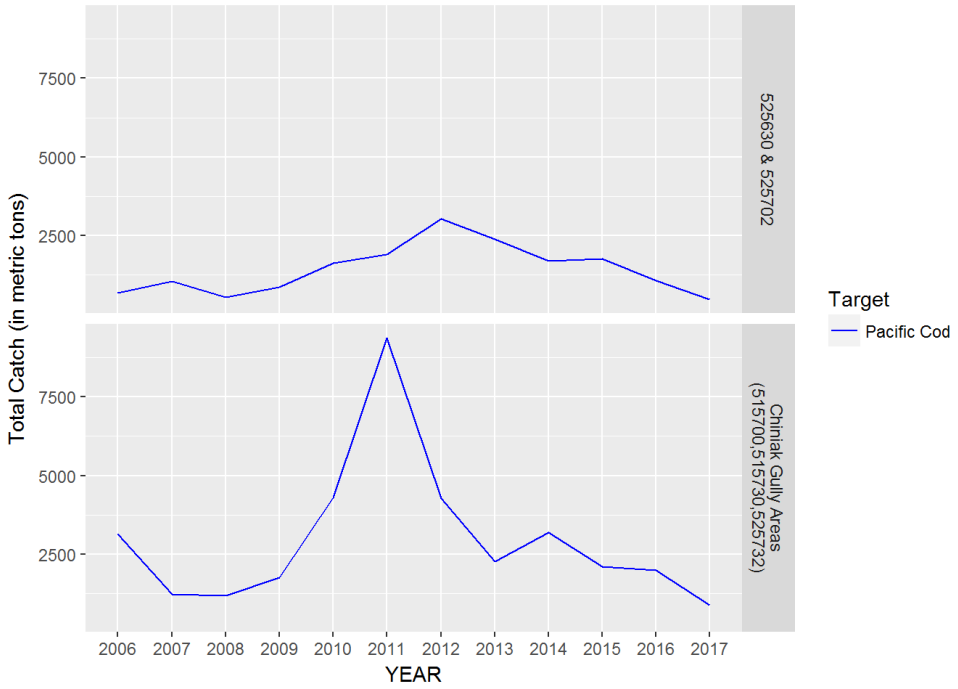

Figure 4. Total Catch on Pot Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732).

Source: NMFS Alaska Region Catch Accounting System
Note: Total catch on pot gear in the sablefish target in 2017 has been excluded due to confidentiality standards.

Figure 5. Vessels using Pot Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732)

Source: NMFS Alaska Region Catch Accounting System
Note: Vessels on pot gear in the sablefish target in 2017 has been excluded due to confidentiality standards.

Figure 6. Landings by Vessels Using Pot Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732).

Source: NMFS Alaska Region Catch Accounting System; Note: A landing is identified as a unique landing report for catcher vessels or vessel/week-end-date combination for catcher/processors. Landings on pot gear in the sablefish target in 2017 has been excluded due to confidentiality standards.

2.2 Fishing Effort in the Area for Non-pelagic Trawl Gear

Summarizing effort by year, gear, statistical area, and target often results in constraints due to confidentiality standards. We have tried to provide the requested information as granularly as possible, but in light of confidentiality constraints, have aggregated statistical areas and some targets. Figures 7, 8, and 9 illustrate non-pelagic trawl gear effort as total catch, number of unique vessels, and number of landings, by target and area from 2006 through 2017. The areas are an aggregation of ADF&G statistical areas 525630 and 525702 or the three ADF&G statistical areas associated with the Chiniak Gully (515700, 515730, and 525732). The targets identified in these figures include deep water flatfish, Pacific cod, Pollock, rockfish and sablefish, and shallow water flatfish. Deep water flatfish is a combination of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets.

Although effort is attributed to different targets in these figures, trips often reflect mixed targeting. Trawl vessels often target multiple species while flatfish fishing. The targets represented here reflect the predominately retained species identified through the Catch Accounting System. Each figure also includes a reference line at 2014 when Amendment 89 to the GOA Groundfish FMP was implemented and required modifications to non-pelagic trawl gear in Central GOA directed flatfish fisheries.

Total catch and the number of unique vessels in the non-pelagic trawl shallow water flatfish fisheries have been steadily declining since 2009. Total catch in the non-pelagic trawl Pacific cod fishery has remained stable, but the number of vessels has decreased. Deep-water flatfish effort (includes arrowtooth flounder)

appears to have increased in the Eastside statistical areas as shown in total catch and numbers of landings in 2016 and 2017 following a large decline in 2015 relative to 2014 (Figures 7 and 9). While the amount of total catch in the non-pelagic trawl fisheries has remained stable for rockfish and sablefish, the number of vessels has increased.

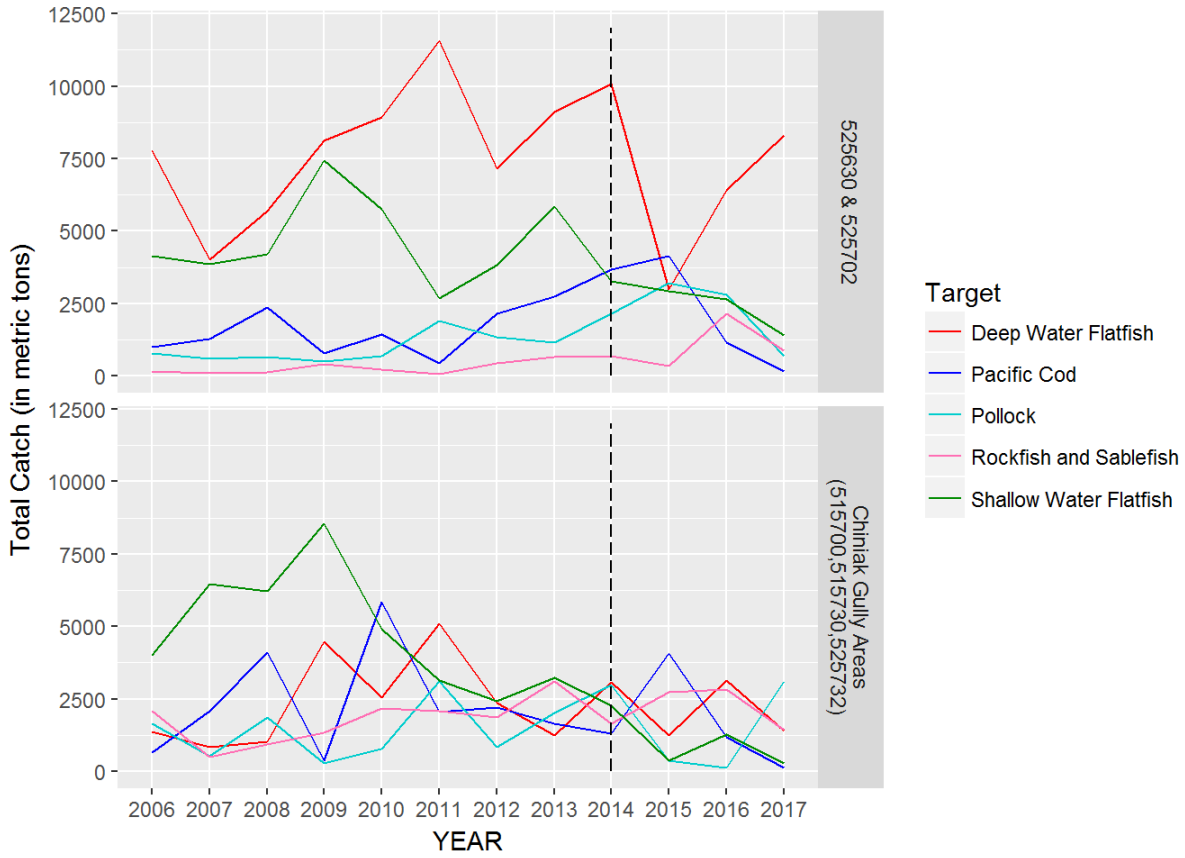

Figure 7. Total Catch on Nonpelagic Trawl Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732)

Source: NMFS Alaska Region Catch Accounting System; Note: Deep water flatfish is comprised of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets. The dashed vertical line corresponds to effective date of modified nonpelagic trawl gear requirement.

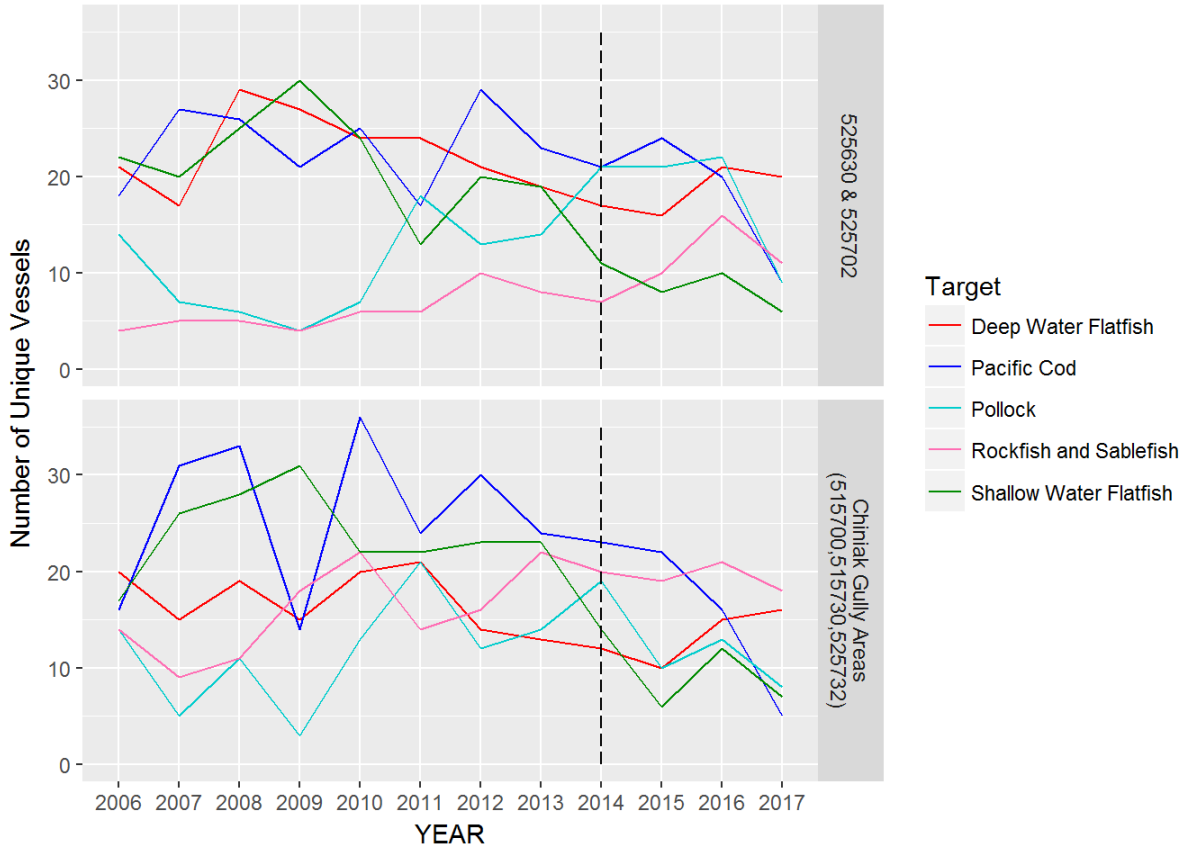

Figure 8. Vessels using Nonpelagic Trawl Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732).

Source: NMFS Alaska Region Catch Accounting System; Note: Deep water flatfish is comprised of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets. The dashed vertical line corresponds to effective date of modified nonpelagic trawl gear requirement.

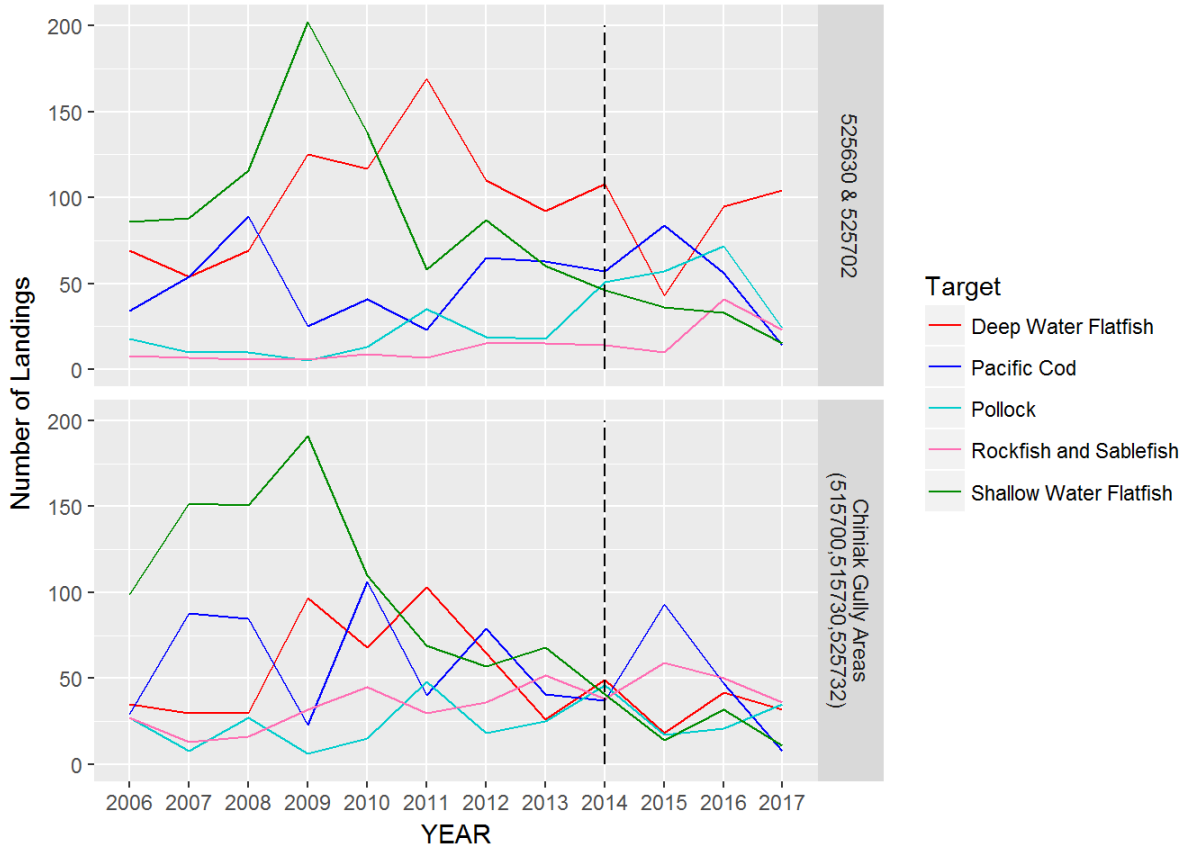

Figure 9. Landings by Vessels using Nonpelagic Trawl Gear, by Area, Target, and Year, 2006-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732).

Source: NMFS Alaska Region Catch Accounting System; Note: A landing is identified as a unique landing report for catcher vessels or vessel/week-end-date combination for catcher/processors. Note: Deep water flatfish is comprised of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets. The dashed vertical line corresponds to effective date of modified nonpelagic trawl gear requirement.

3 Observer Coverage in the Statistical Areas of Interest

In its June 2017 motion, the Council asked that observer coverage rates be evaluated in ADF&G statistical areas 525630, 525702, and the Chiniak Gully between 2006 and 2016 for certain gears and sectors. The following figures and tables summarize the proportion of trips that were observed for several categories of fishing in the areas of interest. The focus is on categories which contain fishing that fall under partial observer coverage requirements in the restructured observer program. Although coverage rates for CP trawl vessels and CGOA rockfish program vessels was requested in the June 2017 Council motion, observer coverage is 100% for these sectors in the GOA.

For this analysis, a trip was identified as a unique landing report for catcher vessels or as a vessel and week-end-date combination for catcher/processors. This method may overestimate the number of trips for both catcher/processors and catcher vessels. Because landing reports are generated for partial deliveries and deliveries to tender vessels, the count of catcher vessel trips may be higher than those used for deployment analysis; however, it is believed to be a small difference for the areas evaluated. Tender operations represent the largest deviation from post-restructure methods since observer restructure

defined deployment for these vessels to encompass multiple deliveries, however trawl tendering does not occur in this area and tender deliveries only account for a small percentage of the trips in the Pacific cod pot fishery in this area.

For this analysis, a trip was flagged as observed if the NMFS Catch Accounting System (CAS) identified at least one sampled haul associated with the vessel and catch report at any point during the trip. If an observer's sample data could not be used, possibly due to incorrect collection, a vessel with an observer onboard appeared as unobserved in the analysis.

Figure 10 shows the proportion of trips in the areas of interest that were observed each year for trawl catcher vessels not participating in the CGOA Rockfish program (Trawl CV) and catcher vessels in the Pacific cod pot fishery (Pot Cod). During this time-period, none of the Pacific cod pot trips were by catcher/processors nor in full observer coverage. Data for years prior to the Observer Program restructure are not included because the Observer Program prior to restructure is not comparable to the Program following restructure.

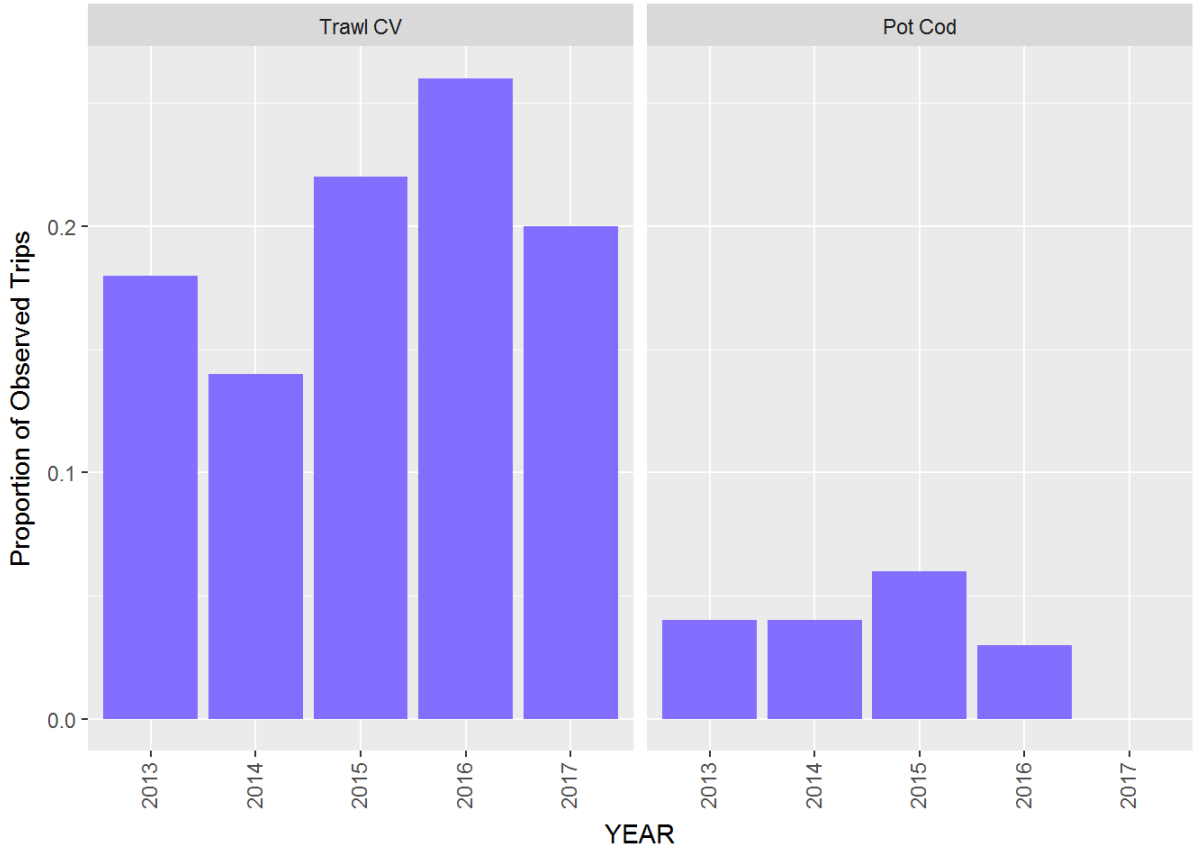

Figure 10. The Proportion of Observed Trips by Category and Year, 2013-2017 in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732).

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data
Note: A trip is identified as a unique landing report for catcher vessels. A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report. Categories include trawl catcher vessels not participating in the CGOA Rockfish Program (Trawl CV) and the Pacific cod pot fishery (Pot Cod).

Table 6 contains proportion information, but also includes the number of unique vessels, the number of trips, and the number of observed trips for the Pacific cod pot fishery and for the trawl catcher vessels not participating in the CGOA Rockfish program.

Table 6. The Proportion of Observed Trips by Category and Year, 2013-2017, in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732)

Year	Number of Vessels	Number of Trips		Proportion of Trips Observed
		Observed	Total	
Trawl Catcher Vessels				
2013	42	88	492	0.18
2014	47	86	633	0.14
2015	41	132	596	0.22
2016	44	201	764	0.26
2017	43	111	564	0.20
Pacific Cod Pot Fishery				
2013	23	8	212	0.04
2014	15	7	183	0.04
2015	22	12	200	0.06
2016	23	5	162	0.03
2017	17	0	148	0.00

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data.
Note: A trip is identified as a unique landing report for catcher vessels. A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report. Trawl catcher vessels participating in the CGOA Rockfish Program are not included.

Figures 11 and 12 examine the proportion of observed trips at the statistical area level following the Observer Program restructure (2013-2017). In these figures, all statistical areas in the Central Gulf of Alaska (NMFS Regulatory Areas 620 and 630) are included for context. Those statistical areas outside the area of interest are shown as gray Xs. There is a symbol plotted for each year in which a statistical area had reported harvest, so as many as five Xs are represented for each area. The five statistical areas of interest in this analysis are each shown with a different symbol. For statistical areas 525630, 525702, 515700, 515730, and 525732, each year is also differentiated by color. For example, the proportion of observed trips in area 515730 in 2014 is depicted with a light blue square. Each statistical area/year combination is plotted along the x-axis based on the number of trips that occurred in that statistical area during the year and along the y-axis based on the proportion of trips in that statistical area that were observed.

Figure 11 shows the proportion of observed trips for trawl catcher vessels not participating in the Central GOA Rockfish program. The proportion of observed trips in the statistical areas of interest (colored shapes) are comparable to the proportion of observed trips in the other statistical areas of the Central GOA (gray Xs). Please note, observer deployment selection by gear type began in 2016. Prior to that, observer deployment covering trawl gear in the partial observer coverage category was through the large vessel trip selection (2015) and trip selection pools (2013 and 2014). Deployment rates set through the Annual Deployment Plan for the strata containing trawl gear in the partial observer coverage category ranged from 14.5 to 28% between 2013 and 2017. A trend that suggests a large difference from what would be expected with randomized coverage was not apparent in the graphs. For example, there is not an

area with consistently low coverage rates or one that differs substantially from areas outside of those requested in the Council motion.

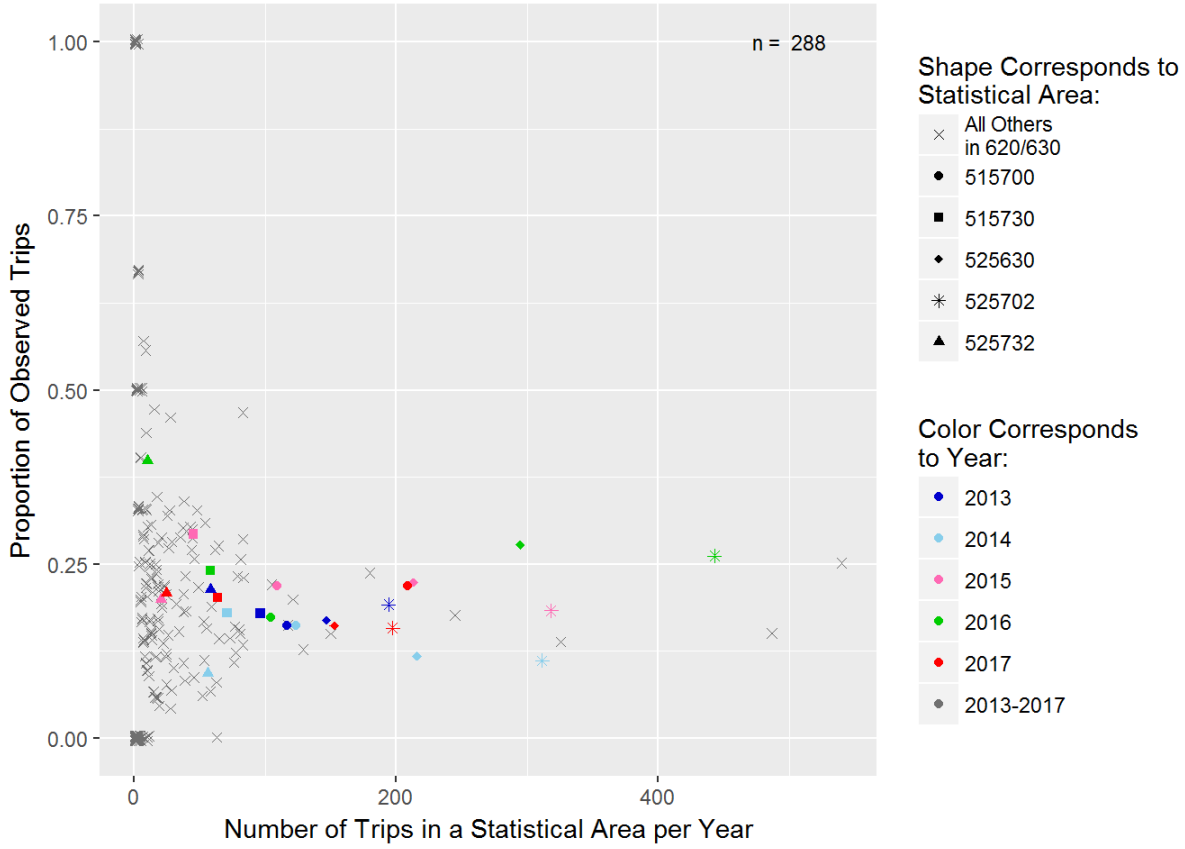

Figure 11. The Proportion of Trawl Catcher Vessel Trips Observed within a Statistical Area per Year, 2013-2017.

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data
Note: A trip is identified as a unique landing report for catcher vessels. A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report. Trips by trawl vessels participating in the CGOA Rockfish Program are not included. A statistical area is represented with a different point for every year in which fishing occurred within it. The statistical areas of interest include 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732). The total number of statistical area and year combinations for the time-period are shown (n=288).

Figure 12 shows the proportion of observed trips by statistical area in the Pacific cod pot fishery. The proportion of observed trips in the statistical areas of interest (colored shapes) are comparable to the proportion of observed trips in other statistical areas of the Central GOA (gray Xs). As mentioned previously, deployment by gear began in 2016. Prior to that, observer deployment covering pot gear in the partial observer coverage category depended on vessel length and was through the large or small vessel trip selection (2015) and trip or vessel selection pools (2013 and 2014). Deployment rates set through the ADP for the strata containing pot gear in the partial observer coverage category ranged from 4 to 24% between 2013 and 2017. This figure only reflects trips on pot gear in the Pacific cod target. The Annual Deployment Plan (ADP) does not deploy observers into specific fisheries (because the

directed fishery cannot always be identified before fishing occurs) but instead observers are deployed to trips and vessels by gear type across all fisheries. Identifying clear trends in the pot fishery was difficult due to the low coverage rates in some years (see Figure 10).

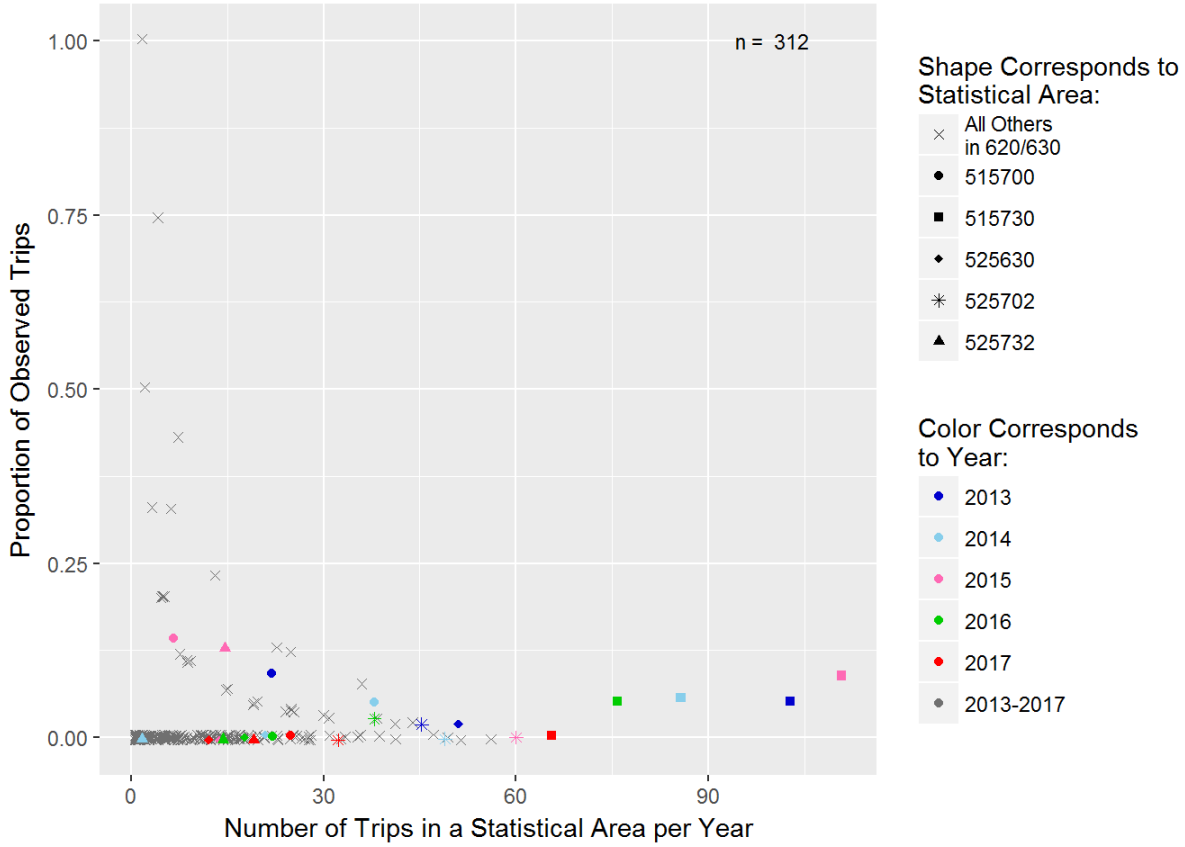

Figure 12. The Proportion of Pacific Cod Pot Fishery Trips Observed within a Statistical Area per Year, 2013-2017.

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data
Note: A trip is identified as a unique landing report for catcher vessels or vessel/week-end-date combination for catcher/processors. A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report. A statistical area is represented with a different point for every year in which fishing occurred within it. The statistical areas of interest include 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732). The total number of statistical area and year combinations for the time-period are shown (n=398).

4 Summary/Conclusions

In this discussion paper, an effort has been made to provide insight into groundfish effort trends and observer coverage consistent with the June 2017 Council motion[9].

4.1 NPT and Pot Cod Effort

Catch, number of unique vessels, and number of trips has been used as an expression of effort for the directed groundfish of interest. While not ideal, consistency in the number of hauls since 2012 as well as vessel size suggests that these measures may provide a rough approximation of effort in the areas of interest. Consistent effort trends were not evident for the NPT flatfish target fisheries considered in the analysis (Figures 7-9). Each NPT fishery varies in terms of maxima and minima for catch, number of unique vessels, and number of trips. Overall trends, best characterized in Table A-1 in the Appendix, actually appear to show decreases in effort. An exception may have occurred in deepwater flatfish effort which appeared to increase in 2016 and 2017. The number of vessels was stable during this period, but catch and number of landings increased. This NPT target, which includes arrowtooth flounder, is associated with the largest Tanner crab PSC totals among NPT CV fisheries in the CGOA.

Pot cod effort as measured through the criteria presented here has generally declined following a pronounced peak in 2012 (Figure 4-6). This gear type is associated with Tanner crab PSC levels equivalent to total NPT PSC (Tables 1, 2).

As with all discarded species except Pacific halibut, mortality of Tanner crab is assumed to be 100% for catch accounting purposes. Although Tanner crab are PSC species in the GOA Groundfish FMP, there is no PSC limit for Tanner crab GOA groundfish fisheries. Fishery behavior by the flatfish or pot cod fleet would likely be different if PSC limits did exist. Management options for reducing Tanner crab PSC are not recommended in this discussion paper. The quantity of Tanner PSC compared to Tanner abundance has been and continues to be quite low (0.15% since 2014 compared to 0.16% before then).

In the 2017 discussion paper, NPT gear contact with bottom habitat was provided that was characterized through the fishing effects model[10] that was used for the five-year omnibus EFH review in April 2017 (see Figure 8 in the discussion paper, and below in Figure 13). As of finalization of this document, an updated time series of gear contact is in preparation and will be available for Council review under separate cover.

[9] http://npfmc.legistar.com/gateway.aspx?M=F&ID=2cacb8e2-455c-487e-9e18-d6d55031c7ad.pdf
[10] http://npfmc.legistar.com/gateway.aspx?M=F&ID=f55791ad-2e93-4fa3-9300-e62bdaddd993.pdf

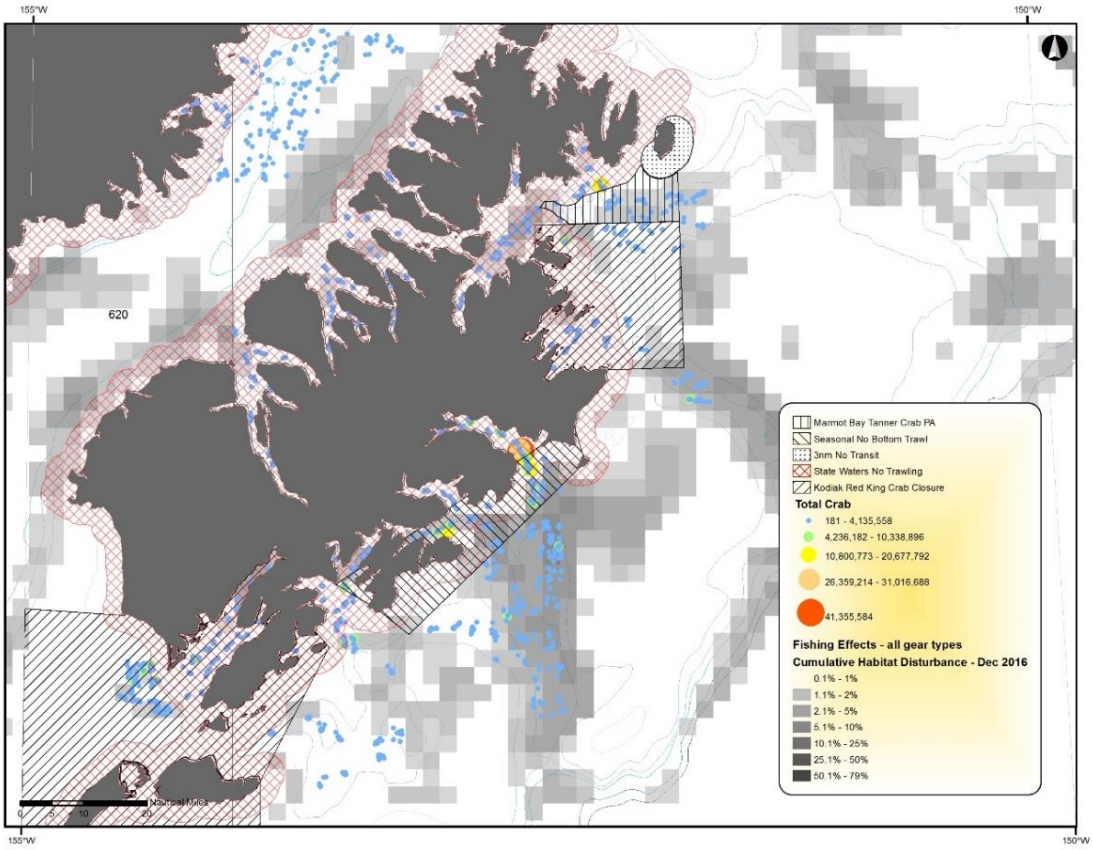

Figure 13. Distribution of Tanner crab from the ADF&G survey, crab protection closure areas, and the footprint of bottom-contacting fishing gear around Kodiak Island. Sources: ADF&G, NOAA Fisheries.

4.2 NPT and Pot Cod Observer Coverage

The fishing sectors evaluated in this paper for observer coverage include CGOA trawl CVs and CGOA CV pot vessels that participate in the partial coverage observer selection pool[11]. As stated above, trawl CPs and rockfish program vessels require 100% observer coverage rendering coverage analysis somewhat moot. The proportion of observed/overall trawl trips in the areas of interest has averaged around 20% since the restructuring of the observer program in 2013. Realized coverage rates are consistent with those established in the Observer Program Annual Deployment Plans[12] for the years considered here. The ADP set NPT coverage at 14% in 2013, 16% in 2014, and 28% for 2016. Since gear specific deployment began in 2016, realized observer coverage rates in the area of interest in the trawl fishery have been within 2% of trawl deployment rates.

Table A2-1 in Appendix 2 provides area-specific realized coverage for the trawl CV fisheries (excluding CGOA rockfish program) by statistical areas. Since trips can cross multiple statistical areas and deployment is across the trawl gear type, we would not expect these rates to equal the deployment rate in the ADP. Figures 11 and 12 above show the proportion of observed trips across statistical areas as a function of the number of trips in those areas. These figures indicate that observer coverage in the areas of

[11] https://alaskafisheries.noaa.gov/sites/default/files/observer-prog-summary.pdf
[12] https://alaskafisheries.noaa.gov/fisheries/observer-program

interest is consistent with randomized deployment. Of note is that each year had different deployment rates, and 2013 and 2014 did not have gear-stratification (trip and vessel selection was used). An area-specific trend would suggest deployment rates that are not consistent with a randomized pattern. Area-specific trends were not apparent in the graphs. For example, there is not an area with consistently low coverage rates or one that differs substantially from areas outside of those requested in the Council motion.

Table A2-2 in Appendix 2 provides area-specific coverage rates for the CV/CP pot fisheries. Observer coverage of these sectors is very low compared to the trawl fleet. Correspondingly, the total number of trips (observed and unobserved) is quite low in the non-GHL pot fishery compared to the trawl fishery (average of 40 pot trips compared to 140 trawl trips per stat area per year).

Increasing observer coverage rates for the pot fisheries in the CGOA could be achieved through the Observer Annual Deployment Plan. Partial coverage pot fisheries typically receive about half the target coverage rate compared to trawl fisheries. The Council will review the 2017 Observer Advisory Committee Report at the June 2018 meeting.

5 References

NPFMC. 2013. SECRETARIAL REVIEW Environmental Assessment, Regulatory Impact Review, and Initial Regulatory Flexibility Analysis for Proposed Amendment 89 to the Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, 605 West 4th Avenue, #306, Anchorage, Alaska 99501.

Rose, C. S., C. F. Hammond, A. W. Stoner, J. E. Munk, and J. R. Gauvin. 2013. Quantification and reduction of unobserved mortality rates for snow, southern Tanner, and red king crabs (Chionoecetes opilio, C. bairdi, and Paralithodes camtschaticus) after encounters with trawls on the seafloor Fish. Bull. 108:136–144

6 Persons Consulted

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Appendix 1: Effort Tables for Non-pelagic Trawl and Pacific Cod Pot Fisheries

Table A1-1 provides a summary of the fishing effort (total catch, landing count, and number of unique vessels) for the non-pelagic trawl and Pacific cod pot fisheries presented above in Figures 4 through 9.

Table A1-2 provides a similar effort summary at the statistical area level.

Table A1-1. Total catch (in metric tons), landings, and unique vessels for the nonpelagic trawl and Pacific Cod pot fisheries, in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732), by gear, target, area, and year, 2006-2017.

	Statistical Areas 525630 and 525702			Chiniak Gully Areas (515700, 515730, 525732)			Total		
Gear and Target	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**
NPT Deep Water Flatfish									
2006	7,769	69	21	1,356	35	20	9,125	92	24
2007	4,005	54	17	848	30	15	4,852	78	20
2008	5,689	69	29	1,026	30	19	6,716	85	30
2009	8,129	125	27	4,474	97	15	12,603	206	28
2010	8,934	117	24	2,545	68	20	11,479	165	26
2011	11,577	169	24	5,094	103	21	16,671	250	29
2012	7,163	110	21	2,363	65	14	9,527	150	22
2013	9,129	92	19	1,249	26	13	10,379	108	20
2014	10,093	108	17	3,089	49	12	13,182	142	19
2015	3,002	43	16	1,253	18	10	4,255	56	18
2016	6,420	95	21	3,140	42	15	9,560	131	23
2017	8,316	104	20	1,391	32	16	9,706	124	21
NPT Pacific Cod									
2006	997	34	18	656	29	16	1,653	58	26
2007	1,279	54	27	2,067	88	31	3,346	124	32
2008	2,354	89	26	4,088	85	33	6,442	160	35
2009	779	25	21	359	23	14	1,139	46	27
2010	1,438	41	25	5,848	106	36	7,287	136	37
2011	422	23	17	2,053	40	24	2,475	57	28
2012	2,160	65	29	2,217	79	30	4,377	124	36
2013	2,743	63	23	1,649	41	24	4,392	92	31
2014	3,688	57	21	1,289	37	23	4,977	86	29
2015	4,135	84	24	4,078	93	22	8,213	168	29
2016	1,161	56	20	1,175	47	16	2,337	90	23
2017	144	14	9	107	8	5	250	20	12

table continued--

	Statistical Areas 525630 and 525702			Chiniak Gully Areas (515700, 515730, 525732)			Total		
Gear and Target	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**
NPT Pollock									
2006	778	18	14	1,651	27	14	2,428	43	19
2007	604	10	7	527	8	5	1,131	16	9
2008	641	10	6	1,859	27	11	2,500	36	15
2009	504	5	4	261	6	3	765	11	7
2010	691	13	7	760	15	13	1,451	22	13
2011	1,910	35	18	3,101	48	21	5,011	67	24
2012	1,335	19	13	839	18	12	2,174	34	18
2013	1,164	18	14	2,016	25	14	3,180	38	20
2014	2,149	51	21	2,994	46	19	5,143	90	26
2015	3,197	57	21	372	17	10	3,569	68	21
2016	2,812	72	22	121	21	13	2,933	82	24
2017	690	24	9	3,103	35	8	3,793	50	11
NPT Rockfish and Sablefish									
2006	148	8	4	2,075	27	14	2,223	31	15
2007	81	7	5	498	13	9	579	18	10
2008	132	6	5	928	16	11	1,060	20	12
2009	390	6	4	1,337	32	18	1,727	37	20
2010	223	9	6	2,161	45	22	2,383	51	23
2011	69	7	6	2,084	30	14	2,153	34	17
2012	450	15	10	1,866	36	16	2,315	48	21
2013	649	15	8	3,107	52	22	3,757	60	25
2014	685	14	7	1,642	38	20	2,327	48	22
2015	357	10	10	2,744	59	19	3,101	64	23
2016	2,161	41	16	2,813	50	21	4,974	83	25
2017	872	23	11	1,439	36	18	2,312	54	21

table continued--

Gear and Target	Statistical Areas 525630 and 525702 Total Catch	Landing Count	Vessel Count	Chiniak Gully Areas (515700, 515730, 525732) Total Catch	Landing Count	Vessel Count	Total Total Catch	Landing Count	Vessel Count
NPT Shallow Water Flatfish									
2006	4,146	86	22	4,017	99	17	8,163	151	23
2007	3,858	88	20	6,463	152	26	10,321	202	26
2008	4,188	116	25	6,230	151	28	10,418	202	29
2009	7,437	202	30	8,544	191	31	15,981	292	32
2010	5,761	138	24	4,922	110	22	10,683	203	25
2011	2,664	58	13	3,134	69	22	5,797	106	22
2012	3,840	87	20	2,423	57	23	6,262	121	26
2013	5,848	60	19	3,222	68	23	9,070	97	26
2014	3,270	46	11	2,280	41	14	5,549	64	16
2015	2,929	36	8	380	14	6	3,309	47	9
2016	2,643	33	10	1,257	32	12	3,900	49	15
2017	1,392	15	6	287	11	7	1,679	20	8
Pacific Cod POT									
2006	678	37	8	3,156	158	26	3,834	190	28
2007	1,058	82	10	1,222	125	18	2,279	207	24
2008	556	53	10	1,182	119	17	1,738	170	22
2009	872	36	6	1,760	99	17	2,632	134	20
2010	1,628	52	7	4,295	129	16	5,923	178	18
2011	1,900	67	8	9,366	295	23	11,265	357	26
2012	3,027	119	14	4,274	223	24	7,301	336	29
2013	2,400	95	14	2,280	125	16	4,680	212	23
2014	1,689	66	7	3,187	123	11	4,877	183	15
2015	1,768	74	10	2,105	127	15	3,873	200	22
2016	1,084	53	11	2,004	112	16	3,088	162	23
2017	476	40	5	895	110	13	1,371	148	17

table continued--

	Statistical Areas 525630 and 525702			Chiniak Gully Areas (515700, 515730, 525732)			Total		
Gear and Target	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**	**Total Catch**	**Landing Count**	**Vessel Count**
NPT All Targets									
2006	13,839	210	31	9,754	210	32	23,593	361	38
2007	9,827	213	35	10,402	291	35	20,228	438	37
2008	13,004	290	39	14,132	309	38	27,136	503	43
2009	17,240	363	39	14,975	349	34	32,215	592	41
2010	17,046	318	38	16,236	344	40	33,282	577	43
2011	16,641	292	35	15,466	290	37	32,107	514	40
2012	14,947	296	41	9,709	255	41	24,655	477	46
2013	19,534	248	35	11,243	212	38	30,777	395	41
2014	19,885	276	34	11,294	211	38	31,179	430	39
2015	13,620	230	34	8,826	201	36	22,446	403	39
2016	15,197	297	36	8,507	192	35	23,704	435	39
2017	11,413	180	26	6,327	122	28	17,740	268	31
NPT All Targets and POT Pacific Cod									
2006	14,517	247	39	12,910	368	57	27,427	551	65
2007	10,884	295	45	11,623	416	53	22,508	645	61
2008	13,560	343	49	15,314	428	55	28,874	673	65
2009	18,112	399	45	16,735	448	51	34,847	726	60
2010	18,674	370	45	20,531	473	55	39,205	755	60
2011	18,541	359	43	24,832	585	59	43,373	871	65
2012	17,974	415	54	13,983	478	64	31,956	813	72
2013	21,934	343	48	13,523	337	54	35,457	607	63
2014	21,574	342	41	14,482	334	49	36,056	613	53
2015	15,388	304	44	10,931	328	51	26,319	603	61
2016	16,281	350	46	10,511	304	51	26,792	597	60
2017	11,890	220	31	7,221	232	41	19,111	416	48

Source: NMFS Alaska Region Catch Accounting System
Deep water flatfish is comprised of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets. Atka mackerel and 'Other Species' targets have been excluded because of their relative infrequency.
Totals reflect total catch, unique landings, and unique vessels across the five areas or across all targets (except Atka mackerel and 'Other Species').
Blank cells indicate no catch occurred.

Table A1-2. Total catch (in metric tons), landings, and unique vessels for the nonpelagic trawl and Pacific Cod pot fisheries, in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732), by gear, target, ADF&G statistical area, and year, 2006-2017.

							Chiniak Gully Areas											
	525630			525702			515700			515730			525732			Total		
Gear and Target	Total Catch	Landing Count	Vessel Count	Total Catch	Landing Count	Vessel Count	Total Catch	Landing Count	Vessel Count	Total Catch	Landing Count	Vessel Count	Total Catch	Landing Count	Vessel Count	Total Catch	Landing Count	Vessel Count
NPT All Targets and Pacific Cod POT																		
2006	3,710	82	24	10,807	203	37	6,320	129	37	6,218	219	45	373	47	17	27,427	551	65
2007	3,691	105	29	7,194	214	41	5,238	181	35	6,057	237	42	328	35	11	22,508	645	61
2008	5,319	118	42	8,241	263	40	8,257	205	42	6,762	241	41	295	40	14	28,874	673	65
2009	7,443	134	29	10,669	313	38	7,377	229	40	9,273	301	42	85	18	13	34,847	726	60
2010	8,063	132	28	10,612	288	41	13,013	284	44	7,282	245	43	236	22	15	39,205	755	60
2011	7,430	144	29	11,111	277	36	12,544	290	42	11,857	343	48	431	25	9	43,373	871	65
2012	8,144	170	35	9,829	308	47	9,153	279	54	4,670	231	45	160	12	8	31,956	813	72
2013	11,753	191	35	10,181	196	40	7,972	174	41	5,384	188	41	167	6	5	35,457	607	63
2014	9,998	174	34	11,576	229	33	9,236	191	40	5,061	156	32	185	6	6	36,056	613	53
2015	4,615	118	31	10,772	229	37	7,217	164	35	3,521	163	33	194	15	4	26,319	603	61
2016	5,455	157	34	10,825	233	40	6,832	167	37	3,488	135	32	191	16	10	26,792	597	60
2017	5,938	108	27	5,951	148	23	5,062	123	33	1,892	99	22	267	21	4	19,111	416	48

Source: NMFS Alaska Region Catch Accounting System
Deep water flatfish is comprised of arrowtooth flounder, rex sole, and deep water flatfish targets. Shallow water flatfish is comprised of flathead sole and shallow water flatfish targets. Atka mackerel and 'Other Species' targets have been excluded because of their relative infrequency.
Totals reflect total catch, unique landings, and unique vessels across the five areas or across all targets (except Atka mackerel and 'Other Species').
Blank cells indicate no catch occurred
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Appendix 2: Observer Coverage Tables for Non-pelagic Trawl and Pacific Cod Pot Fisheries

Table A2-1 supplement to Figure 11 above, provides the proportion of trawl catcher vessel trips observed within a statistical area per year in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732), 2013 to 2017.

		Number of Trips			
Category	**Statistical Area**	**Not Observed**	**Observed**	**Total**	**Proportion Observed**
2013					
Trawl CV	515700	98	19	117	0.16
Trawl CV	515730	79	17	96	0.18
Trawl CV	525630	122	25	147	0.17
Trawl CV	525702	158	36	194	0.19
Trawl CV	525732	46	12	58	0.21
2014					
Trawl CV	515700	104	20	124	0.16
Trawl CV	515730	58	13	71	0.18
Trawl CV	525630	189	27	216	0.12
Trawl CV	525702	276	35	311	0.11
Trawl CV	525732	51	5	56	0.09
2015					
Trawl CV	515700	85	24	109	0.22
Trawl CV	515730	32	13	45	0.29
Trawl CV	525630	167	46	213	0.22
Trawl CV	525702	260	58	318	0.18
Trawl CV	525732	16	4	20	0.20
2016					
Trawl CV	515700	86	18	104	0.17
Trawl CV	515730	44	14	58	0.24
Trawl CV	525630	211	84	295	0.28
Trawl CV	525702	328	115	443	0.26
Trawl CV	525732	6	4	10	0.40
2017					
Trawl CV	515700	163	46	209	0.22
Trawl CV	515730	51	13	64	0.20
Trawl CV	525630	129	24	153	0.16
Trawl CV	525702	166	31	197	0.16
Trawl CV	525732	19	5	24	0.21

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data.
A trip is identified as a unique landing report for catcher vessels or vessel/week-end-date combination for catcher/processors.
A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report.
Trawl catcher vessels participating in the CGOA Rockfish Program are not included.

Table A2-2 supplement to Figure 12 above, provides the proportion of Pacific pot cod trips observed within a statistical area per year in ADF&G statistical areas: 525630, 525702, and Chiniak Gully Areas (515700, 515730, and 525732), 2013 to 2017.

		Number of Trips			
Category	**Statistical Area**	**Not Observed**	**Observed**	**Total**	**Proportion Observed**
2013					
Pot Cod	515700	20	2	22	0.09
Pot Cod	515730	98	5	103	0.05
Pot Cod	525630	50	1	51	0.02
Pot Cod	525702	44	1	45	0.02
2014					
Pot Cod	515700	36	2	38	0.05
Pot Cod	515730	81	5	86	0.06
Pot Cod	525630	21	0	21	0
Pot Cod	525702	49	0	49	0
Pot Cod	525732	2	0	2	0
2015					
Pot Cod	515700	6	1	7	0.14
Pot Cod	515730	101	10	111	0.09
Pot Cod	525630	14	0	14	0
Pot Cod	525702	60	0	60	0
Pot Cod	525732	13	2	15	0.13
2016					
Pot Cod	515700	22	0	22	0
Pot Cod	515730	72	4	76	0.05
Pot Cod	525630	18	0	18	0
Pot Cod	525702	37	1	38	0.03
Pot Cod	525732	14	0	14	0
2017					
Pot Cod	515700	25	0	25	0
Pot Cod	515730	66	0	66	0
Pot Cod	525630	12	0	12	0
Pot Cod	525702	32	0	32	0
Pot Cod	525732	19	0	19	0

Source: NMFS Alaska Region Catch Accounting System (CAS) PSC Data.
A trip is identified as a unique landing report for catcher vessels or vessel/week-end-date combination for catcher/processors.
A trip is identified as observed if CAS identifies at least one observed haul associated with the vessel and catch report.