DISCUSSION PAPER: GEAR SPECIFIC ALLOCATIONS FOR BSAI GREENLAND TURBOT TOTAL ALLOWABLE CATCH

Introduction

In October 2011, the North Pacific Fishery Management Council (Council) received testimony during staff tasking requesting that the Council initiate a discussion paper to consider establishment of gear allocations for the Bering Sea and Aleutian Islands (BSAI) Greenland turbot fishery. The intent would be to establish allocations among the fixed gear (primarily longline catcher - processors) and groundfish trawl (Amendment 80) sectors. The objective of the allocations would be to prevent closures of the Greenland turbot directed fishery in the Bering Sea and Aleutian Islands.

The Aleutian Islands (AI) Greenland turbot fishery was closed to directed fishing in 2008, 2009 and 2010 after the AI specific TAC was reached. The Bering Sea (BS) Greenland turbot fishery was closed to directed fishing in 2003, 2006 (reopened later in the year), 2007, and 2008. The fixed gear sector is concerned that increased Greenland turbot catch in the Amendment 80 sector would deprive the longline sector of historic fishing opportunities if the directed fishery continued to be closed. The presentation from the Freezer Longline Coalition suggested gear specific allocations as a way to assure historic fishing opportunities for each sector.

This paper summarizes the BSAI Greenland turbot longline and trawl fisheries and presents information the Council may wish to consider if it chooses to advance the issue of gear allocations for the BSAI Greenland turbot fishery.

Greenland Turbot Biology and Assessments

Greenland turbot (*Reinhardtius hippoglossoides*), sometimes known as Greenland halibut, belongs to the Pleuronectidae family (right eye flounders), and is the only species of genus *Reinhardtius*. The American Fisheries Society uses the common name "Greenland halibut", but to avoid confusion with Pacific halibut (*Hippoglossus stenolepsis*), the marketing name in the U.S. and Canada is Greenland turbot. Greenland turbot occur in both the northern Pacific and Atlantic oceans, but are absent from the Arctic Ocean (Fig. 1). No significant differences have been found between populations in the Atlantic and the Pacific, and they are considered the same species. In the North Pacific, Greenland turbot are mainly distributed in the eastern Bering Sea (EBS) and Aleutian Islands (AI). Juveniles are believed to spend the first 3-4 years on the continental shelf and then move to the continental slope (Alton et al. 1099, Sohn 2009). Greenland turbot are found in deep water from 200 to 1,600 m, but have been caught at depths of more than 2,200 m. Tagging studies have suggested that Greenland turbot can range over distances of several thousand kilometers and alternate between deep water and shallower, shelf waters. Juvenile Greenland turbot are absent in the AI region, suggesting that population in the Aleutians originates from the EBS or elsewhere. The Bering Sea and Aleutian Islands (BSAI) Stock Assessment and Fishery Evaluation (SAFE) report treats Greenland turbot in the EBS and AI as a single management stock.

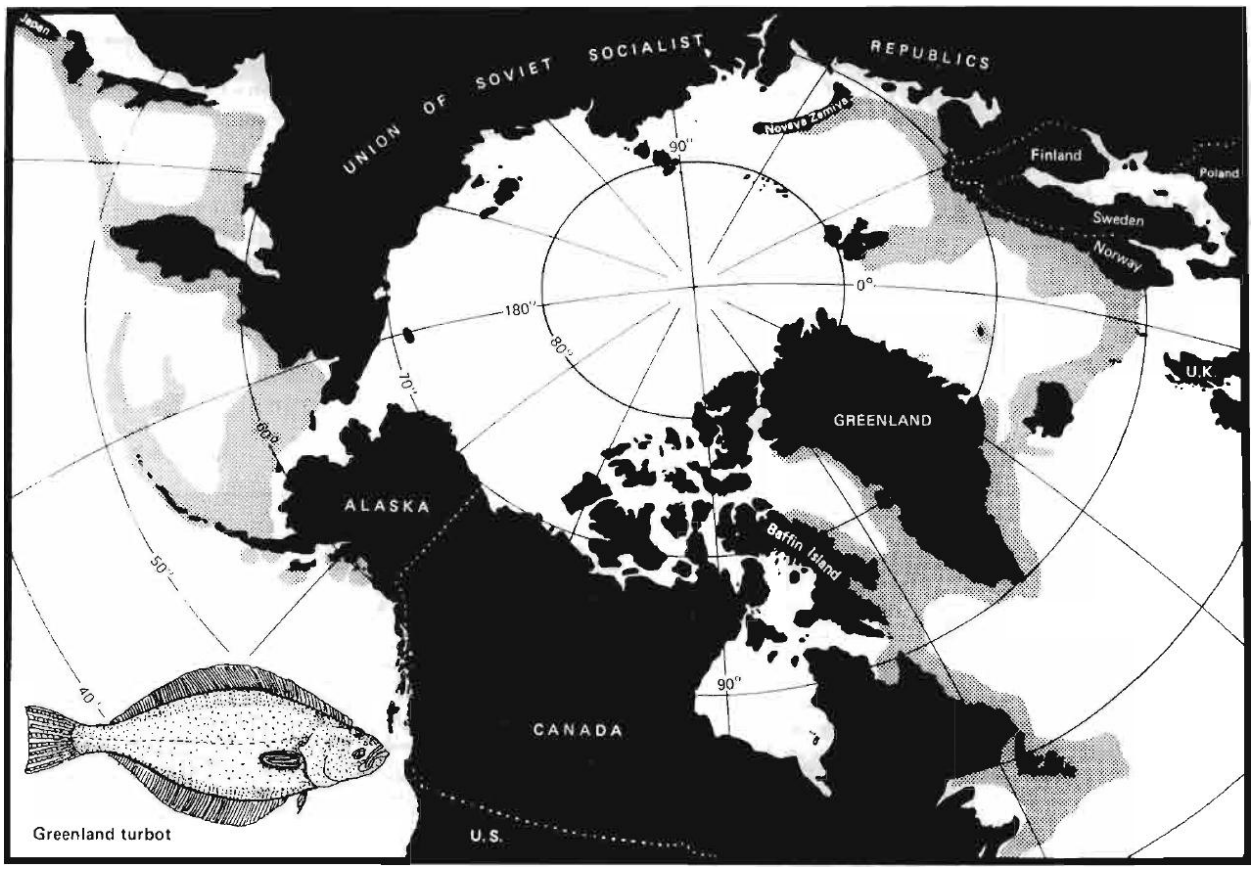

Figure 1. Global distribution of Greenland turbot. From Alton et al. 1988.

Spawning appears to occur in the eastern Bering Sea in winter and may be protracted, starting in September or October and continuing until March. The peak of spawning appears to occur in November to February (Shuntov 1970, Bulatov 1983). Relatively small numbers of eggs are spawned by females universally on the continental slope. In the eastern Bering Sea, juvenile (age 0-5) Greenland turbot inhabit relatively shallow water (<200 m) on the broad continental shelf, before moving to the slope waters at older ages. Sexual maturity is reached at 5-10 years in the eastern Bering Sea, and Greenland turbot may live as long as 20 years, reaching 120 cm and 16-17 kg (NOAA 1988).

Resource Surveys

The abundance of Greenland turbot in the BSAI has varied considerably over the last several decades (Table 1). As abundance estimates have fluctuated, the catch of Greenland turbot has also fluctuated. After many years of low abundance, there are recent signs of good year classes, which may increase both the abundance and allowable catch of Greenland turbot.

EBS slope and shelf bottom trawl survey

Surveys occurred on the continental shelf slope every third year from 1979 – 1991 (including 1981) as part of an American – Japanese cooperative agreement. In 2002, the Alaska Fisheries Science Center (AFSC) re-established the bottom trawl survey of the upper continental slope of the eastern Bering Sea and a second survey was conducted in 2004.

Table 1. Survey estimates of Greenland turbot (t) for the Eastern Bering Sea shelf and slope, and the Aleutian Islands region, 1975 – 2008. From 2011 BSAI SAFE report.

	Eastern Bering Sea		Aleutian
Year	Shelf	Slope	Islands
1975	126,700		
1979	225,600	123,000	
1980	172,200		48,700*
1981	86,800	99,600	
1982	48,600	90,600	
1983	35,100		63,800*
1984	17,900		
1985	7,700	79,200	
1986	5,600		76,500*
1987	10,600		
1988	14,800	12,700	
1989	8,900		
1990	14,300	40,500	
1991	13,000		11,925
1992	24,000		
1993	30,400		
1994	48,800		28,277
1995	34,800		
1996	30,300		
1997	29,218		28,334
1998	28,126		
1999	19,797		
2000	22,957		9,359
2001	25,347		
2002	21,450	27,589	9,891
2003	23,685		
2004	20,910	36,557	11,334
2005	21,359		
2006	20,933		20,934
2007	16,726		
2008	13,514	17,901	NA
2009	10,956		
2010	23,415	19,873	6,795
2011	26,156		

* U.S. – Japanese cooperative surveys

There was a gap in the planned biennial slope surveys when the 2006 survey was canceled but the surveys resumed in the summer of 2008 and 2010.

Because Greenland turbot are found reliably in habitats that are not covered in the trawl slope surveys, the surveys are likely to underestimate the abundance of Greenland turbot in the BSAI. Therefore, the survey results are treated as an index of abundance that represents 75% of the stock, based on analyses of earlier assessments (Ianelli et al. 1993). The estimated biomass of Greenland turbot in the BSAI has fluctuated over the years from a high over more than 300,000 mt in 1979 to less than 25,000 mt in 1991. When U.S. – Japanese surveys were conducted in the late 70s – early 80s, the combined survey biomass suggested a decline in abundance. After 1985, the combined slope and slope biomass estimates have averaged 55,000 mt. The average shelf survey biomass from 1993 – 2011 is 24,680 mt. Ianelli et al. (2010) reported that the 2010 EBS slope trawl survey biomass estimate was up by 11% from 2008, with most of the change due to Greenland turbot abundance in the 400-600 m depth strata. As estimates of biomass increase, TAC is also likely to increase which also affects the economic consequences of allocation decisions. These consequences would be fully considered if the Council elects to initiate a full analysis of this proposal.

Aleutian Island Survey

Ianelli et al. (2010) reported that the 2010 Aleutian Islands trawl survey estimate for Greenland turbot was 6,800 mt, which is well below the 1991 – 2010 average level of 15,800 mt. The eastern AI has the highest densities, and contains approximately 61% of the Greenland turbot AI biomass, based on surveys from 1991 – 2010.

Longline survey

Greenland turbot are encountered during the sablefish longline surveys that alternate between the Aleutian Islands and the Eastern Bering Sea slope. In 2011, the surveys took place in the EBS, but a high number of orca predation events confounded results. Results from surveys conducted from 1996 - 2011 indicated that about 33% of the Greenland turbot population along the combined slope regions surveys is found within the northeast and southeast portions of the Aleutian Islands.

Killer whale, or other toothed whale depredation is a problem encountered in longline fisheries worldwide (Hamer et al. 2012). Depredation can impact managers' ability to sustainably manage fish stocks and impact the economic stability or sustainability of commercial fisheries. Establishing total commercial catch can be affected by whale depredation as depredated fish are not accounted for by the fishery. Additionally, during surveys depredation can artificially lower CPUE for target fish stocks, which could lead to lower TAC (Hamer et al. 2012). Studies in the Bering Sea between 1980 and 1989 (Yano and Dahlheim 1995) concluded that the average annual monetary loss to Bering Sea groundfish fisheries ranged from $2,982 to $34,571. Some recent investigations on how to account for depredation events have highlighted the need for more detailed analysis (Ianelli et al. 2011).

Greenland Turbot Fisheries

Historic Fisheries

Catch of Greenland turbot and arrowtooth founder were not distinguished during the 1960s. During that period, combined catches of the two species ranged from 10,000 to 58,000 tons annually and averaged 33,700 mt. Beginning in the 1970s the fishery for Greenland turbot intensified with catches of this species reaching a peak from 1972 to 1976 of between 63,000 and 78,000 mt annually. Catches declined after implementation of the Fishery Conservation and Management Act in 1977 (Table 2), but were still relatively high in 1980 – 1983 with an annual range of 48,000 to 57,000 mt. After 1983, however, total

harvests declined steadily to a low of 1,829 mt in 2007. Total Allowable Catch (TAC) limits were established in 1986 (33,000 mt). From 1990 – 1995, the Council set the Allowable Biological Catch (ABCs) and Total Allowable Catch (TACs) to 7,000 mt, citing concerns about low survey biomass estimates and low recruitment. The TAC increased to 15,000 mt in 1998, but dropped to a low of 2,440 mt in 2007. Table 3 shows the Greenland turbot TAC for the BS and AI subareas since 2001. In general, the AI subarea TAC has been less than half of the BS subarea TAC, due to differences in the estimates biomass in each subarea (Table 1). In 2011, the Advisory Panel to the Council recommended raising the TACs for Greenland turbot because of increasing value, and increasing estimated biomass. If biomass estimates continue to rise, the Greenland turbot TAC is also likely to rise. If the Council elects to initiate a full analysis of this proposal, potential allocations based on subarea TAC may be considered as part of any alternatives selected by the Council for review.

Table 2. Catch estimates (mt) of Greenland turbot by gear type (including discards) and ABC and TAC values, 1977 – 2011.

Year	Trawl	Longline & Pot	Total	ABC	TAC
1977	29,722	439	30,161	40,000	
1978	39,560	2,629	42,189	40,000	
1979	38,401	3,008	41,409	90,000	
1980	48,689	3,863	52,552	76,000	
1981	53,298	4,023	57,321	59,800	
1982	52,090	32	52,321	59,800	
1983	47,529	29	47,558	65,000	
1984	23,107	13	23,120	47,500	
1985	14,690	41	14,731	44,200	
1986	9,864	>1	9,864	35,000	33,000
1987	9,551	34	9,585	20,000	20,000
1988	6,827	281	7,108	14,100	11,200
1989	8,293	529	8,822	20,300	6,800
1990	12,119	577	15,696	7,000	7,000
1991	6,245	1,617	7,863	7,000	7,000
1992	749	3,003	3,752	7,000	7,000
1993	1,145	9,323	8,467	7,000	7,000
1994	6,426	3,845	10,272	7,000	7,000
1995	3,978	4,215	8,194	7,000	7,000
1996	1,653	4,902	6,555	7,000	7,000
1997	1,209	5,989	7,199	9,000	9,000
1998	1,830	7,319	9,149	15,000	15,000
1999	1,799	4,057	5,857	9,000	9,000
2000	1,949	5,027	6,973	9,300	9,300
2001	2,149	3,163	5,312	8,400	8,400
2002	1,033	5,605	3,638	8,000	8,000
2003	908	2,605	3,513	4,000	4,000
2004	675	1,544	2,220	3,500	3,500
2005	729	1,831	2,559	3,500	3,500
2006	360	1,605	1,965	2,740	2,740
2007	429	1,400	1,829	2,440	2,440
2008	1,935	806	2,741	2,540	2,540
2009	3,080	1,417	4,497	7,380	7,380
2010	2,070	1,975	4,046	6,120	6,120
2011	1,617	2,013	3,630	6,140	5,050

Source: Ianelli et al. 2011.

Table 3. Bering Sea (BS) and Aleutian Islands (AI) subarea TAC from 2001 – 2013.

Year	BS	AI
2001	5,628	2,772
2002	5,630	2,640
2003	2,680	1,320
2004	2,700	800
2005	2,700	800
2006	1,890	850
2007	1,680	760
2008	1,750	790
2009	5,090	2,290
2010	4,220	1,900
2011	3,500	1,550
2012	6,230	2,430
2013	6,010	2,020

Before 1985, Greenland turbot and arrowtooth flounder were managed together. Since then the Council has recognized the need for separate management quotas, given large differences in the market value and the differences in abundance trends for these two species (Wilderbuer and Sample 1992). Greenland turbot are fished by both fixed (longline, pot) and trawl gear in a limited access, derby-style fishery. The pot catch has typically been much smaller than the longline catch. From 1977 to 1997, the catch of Greenland turbot was dominated by trawlers (Fig. 2). Trawl catch ranged from 53,298 mt in 1981 to 749 mt in 1992. At the same time, Allowable Biological Catch (ABC) ranged from 90,000 mt

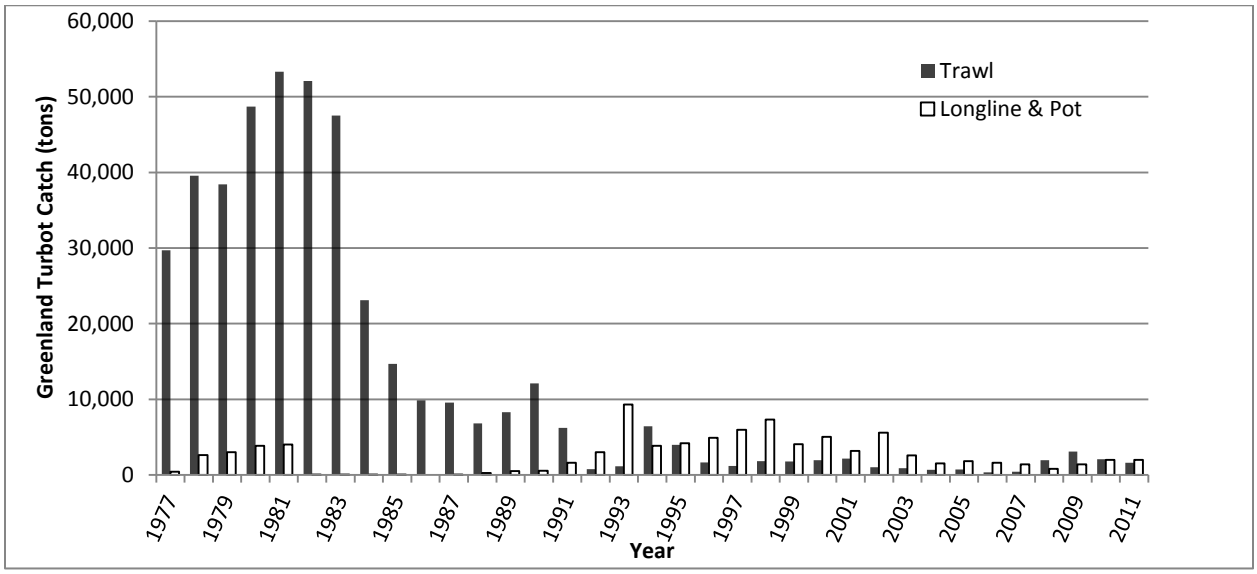

Figure 2. Estimated catch of Greenland turbot by trawl and fixed gear (longline & pot) from 1977 – 2011.

in 1979 to 7,000 mt in 1991. Total Allowable Catch (TAC) limits were established in 1986 (33,000 mt) and dropped to 7,000 mt in 1990. It was not until 1992 that fixed gear catch (3,003 mt) exceeded trawl

catch (749 mt). From 1992 to 2007, with the exception of 1994, fixed gear catch was greater than trawl catch, although total overall catch was much smaller than the period before 1990, and particularly from 1977 to 1985. Fixed gear catch exceeded trawl catch until 2008 and 2009. In 2010 and 2011 fixed gear and trawl catch was nearly equal.

Longline fishery

The longline fishery is conducted primarily with catcher/processor vessels, although some catcher-vessels have participated in some years. The number of longline vessels targeting Greenland turbot from 2001 – 2011 has ranged from 6-21. The majority of Greenland turbot catch in the longline fleet occurs while directly targeting Greenland turbot (Table 4, Fig. 3). The longline fleet generally targets pre-spawning aggregations of Greenland turbot. The fishery opens May 1, but usually occurs from June – August in the EBS to avoid killer whale depredation. Longliners in the Aleutian Islands subarea will often switch from sablefish to Greenland turbot if killer whale depredation is high.

Table 4. Estimates of Greenland turbot catch (t) by gear and target fishery, 2004 – 2011. From 2011 BSAI SAFE

	Target fishery	2004	2005	2006	2007	2008	2009	2010	2011
Longline and Pot	Greenland turbot	1,168	1,527	1,212	1,097	573	1,192	1,818	1,371
	Sablefish	90	75	114	130	119	122	77	41
	Pacific cod	221	170	77	129	76	84	121	152
	Shallow-water flatfish	64	57	61	15	15	7	77	26
	Arrowtooth flounder	0	2	140	16	0	9	53	0
	Others	1	0	3	12	22	4	0	
Trawl	Greenland turbot	61	*	0	*	*	1,349	118	4
	Pacific cod	79	15	19	89	11	2	7	0
	Arrowtooth flounder	53	154	21	3	1,176	1,435	1,689	892
	Kamchatka flounder								582
	Atka mackerel	123	167	117	130	201	118	62	45
	Flathead sole	191	150	28	30	98	49	12	2
	Pollock	18	31	65	107	82	44	1	4
	Rockfish	74	139	74	47	143	73	59	22
	Other flatfish	51	34	1	12	11	4	1	0
	Rock sole	4	1	27	8	0	2	3	1
	yellowfin sole	1	7	8	1	1	4	1	4
	Sablefish	12	7	0	0	6	0	12	6
	Others	8	0	0	0	0	0	0	0

* Confidential data

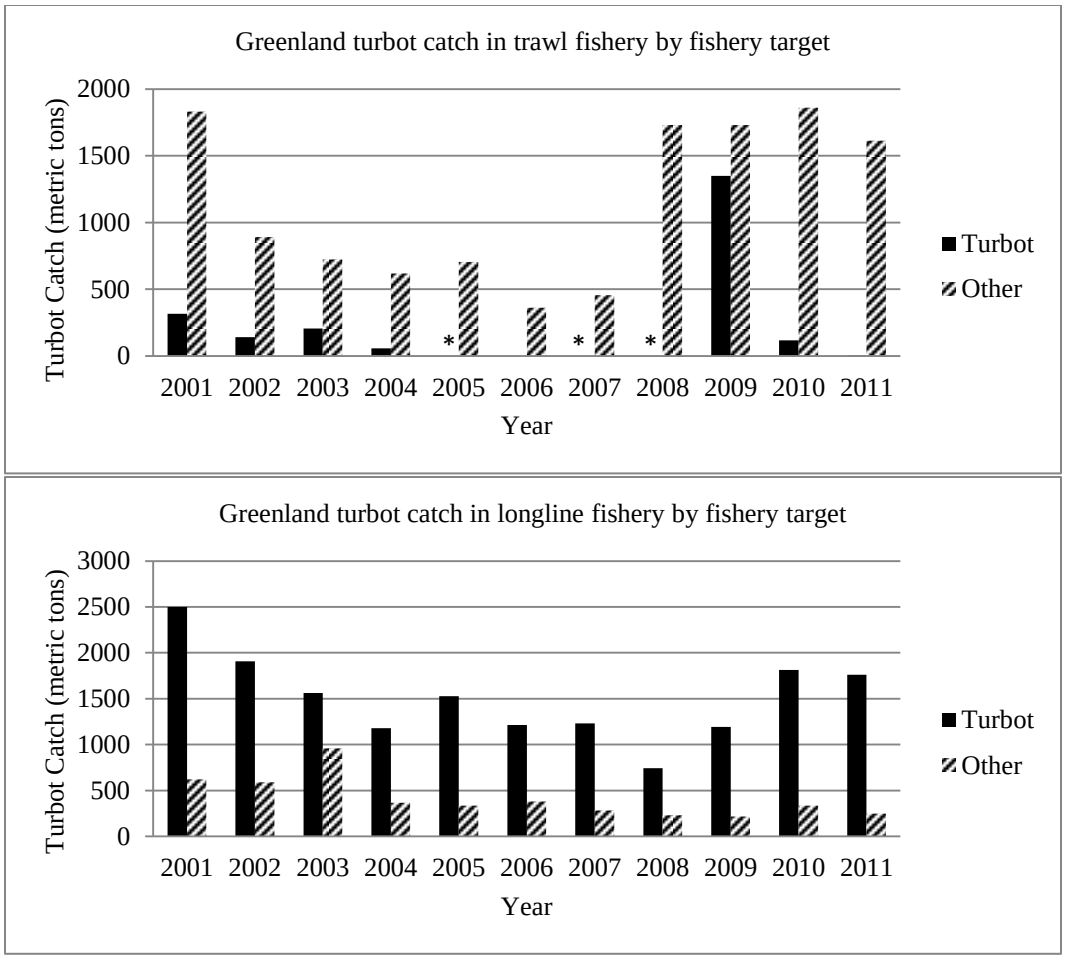

Figure 3. Directed and incidental catch of Greenland turbot in the BSAI trawl and longline fisheries, 2001 – 2011. * Confidential data

Trawl fishery

The Greenland turbot trawl fishery also occurs primarily with catcher/processor (CP) vessels. Although a few landings from catcher-vessels are reported, those data are not distinguished from the CP catch in this discussion. The number of participating vessels reported to have targeted Greenland turbot from 2001 – 2011 ranged from 1 to 8 vessels. Data for seasons with three or fewer participants are confidential, and those data are not shown here. However, directed catch during those low-participant years were deminimus, and total catch (targeted and incidental) is reported. The fishery typically occurs from late June – early September, although catches in 2009 and 2010 occurred substantially earlier than in other years (Fig. 4). The earlier start in 2009 and 2010 is primarily due to Amendment 80 vessels targeting Kamchatka and arrowtooth flounder in the Aleutian Islands, an area of typically higher Greenland turbot incidental catch (T. Loomis, Pers. Comm. May, 2012). This early Greenland turbot catch may have contributed to the closures of the AI Greenland turbot directed fishery in 2009 and 2010. In 2011, cooperative agreements amongst the Amendment 80 vessels imposed area restrictions on the Kamchatka and arrowtooth flounder fisheries to reduce Greenland turbot incidental catch (T. Loomis, Pers. Comm. Jan, 2012).

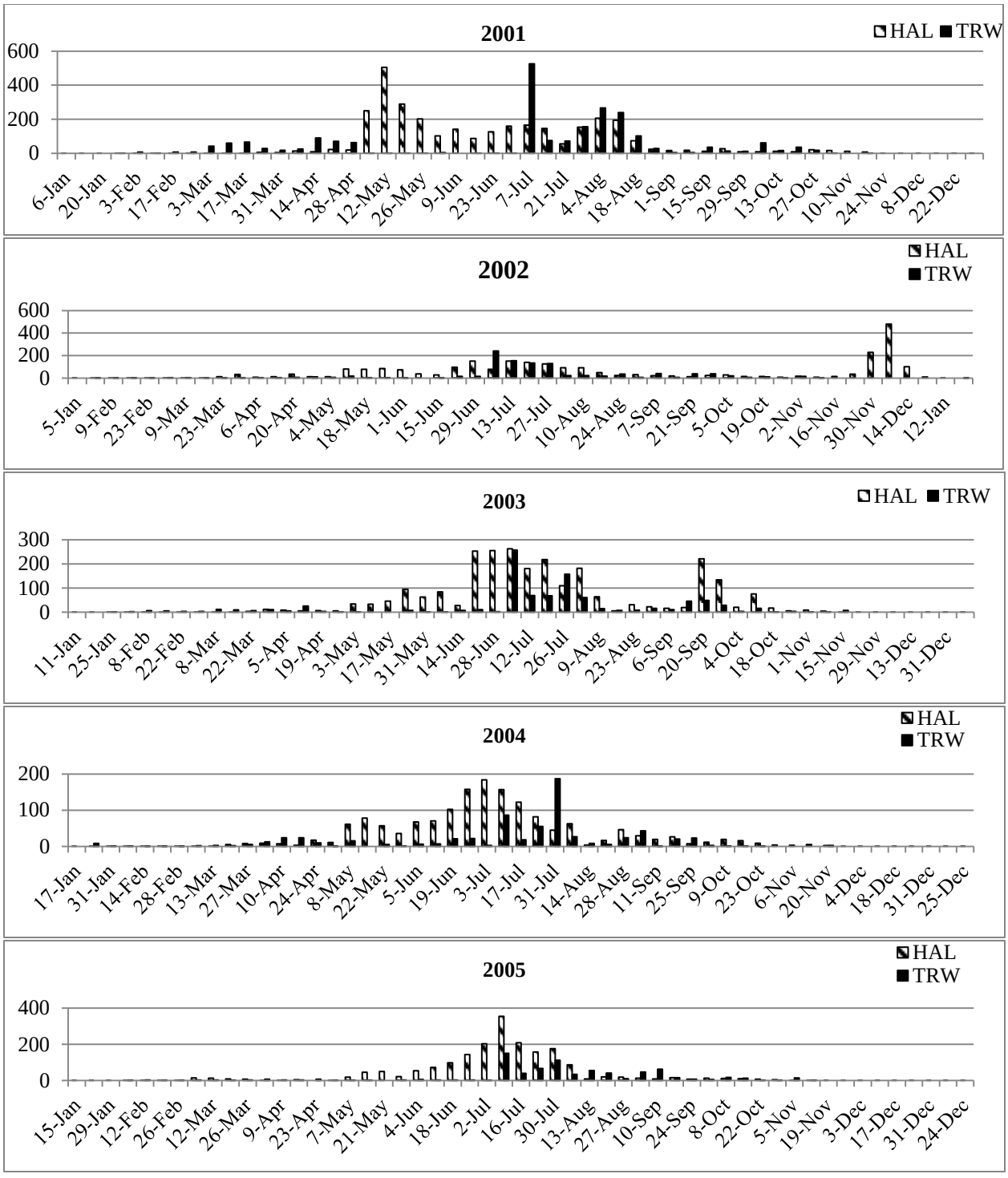

Figure 4. Timing and magnitude of Greenland turbot landings for longline (HAL, hashed bars) and trawl (TRW, solid bars) fisheries from 2001 – 2011 in the Bering Sea and Aleutian Islands.

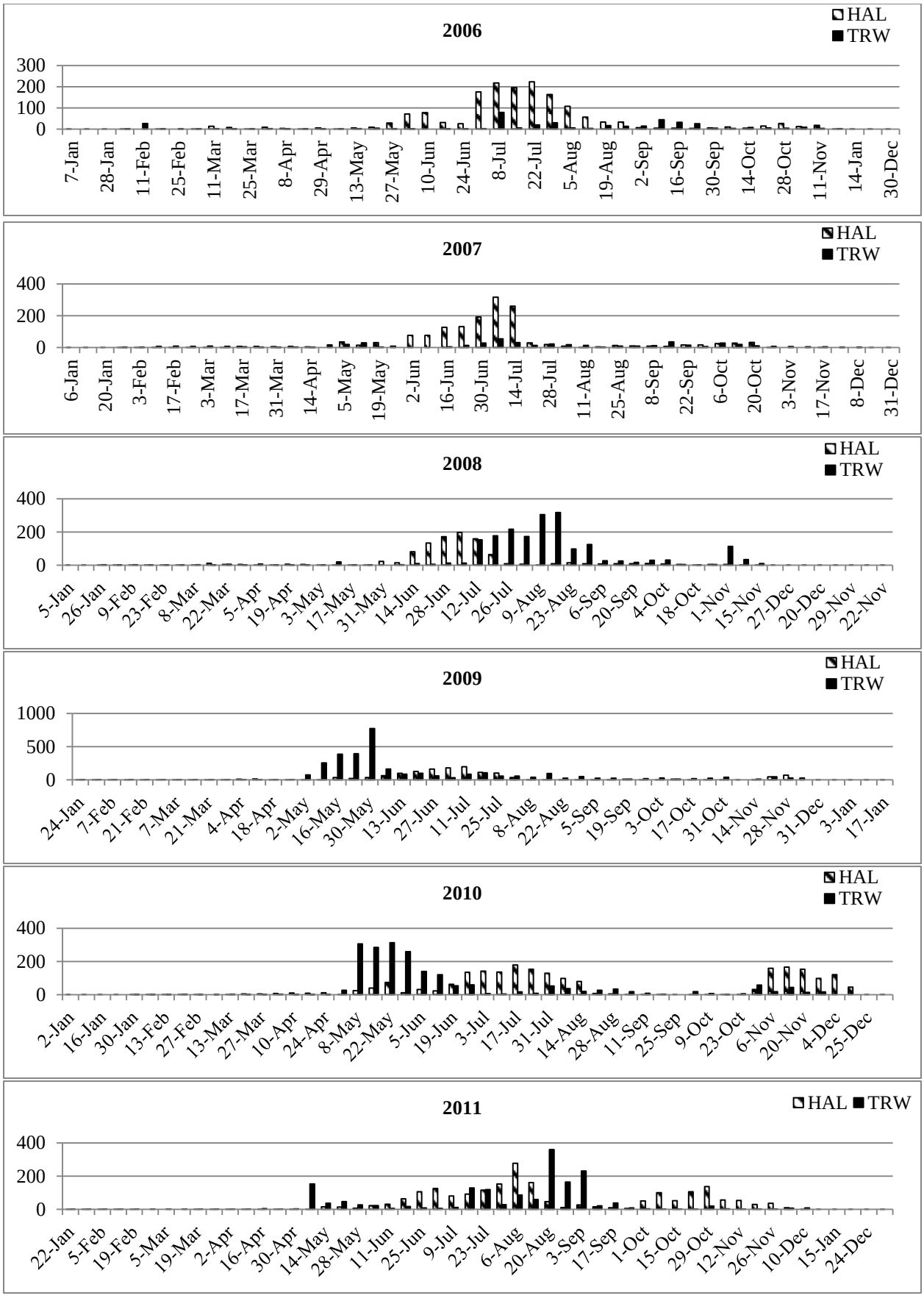

Figure 4. Continued.

The trawl fleet typically catches Greenland turbot while targeting other fish species. In recent years fisheries for Arrowtooth/Kamchatka flounder, Atka mackerel, and flathead sole have accounted for the majority of Greenland turbot catch, but Greenland turbot rare also caught while targeting Pacific cod, pollock, and rockfish (Table 4). In 1994, the Council set most of the groundfish Maximum Retainable Amounts (MRAs) at zero, relative to retained amounts of arrowtooth founder to prevent vessels from using arrowtooth flounder as a basis species for retention of more valuable species that were closed to directed fishing (known as "topping off"). Since 1997, markets for arrowtooth flounder have developed, and arrowtooth flounder now supports a viable target fishery. Greenland turbot caught incidentally during the arrowtooth/Kamchatka flounder fishery are retained only as long as the directed fishery for Greenland turbot is open. Once the directed fishery is closed, Greenland turbot move to Prohibited Species Catch (PSC) status because the MRAs for Greenland turbot are currently at zero. In 2011, the Council recommended amending MRAs for arrowtooth flounder as a basis species, and recommended a MRA for Greenland turbot at 7%, which would allow retention of Greenland turbot after the directed fishery for Greenland turbot has closed, and reduce the regulatory discards for this species. The recommended changes are in review and have not yet been implemented. It is not yet certain what impact increased MRAs on Greenland turbot could have on the prosecution of the Kamchatka/arrowtooth fishery, and its impact on Greenland turbot incidental catch. These implications would be analyzed should the Council initiate a full analysis of this proposal.

The BSAI trawl fishery has historically been constrained by PSC limits on Pacific halibut. Halibut PSC is assigned to target species, based on value of the target: higher value targets generally received higher halibut PSC amounts. Because of low TAC and a period of low product value, halibut PSC attributed to the Greenland turbot fishery was low for several years, and trawl catch of Greenland turbot was accordingly low. Halibut PSC is currently being considered by the Council. Any future allocations, and catch, of Greenland turbot is likely to be affected by any changes in halibut PSC.

Amendment 80 to the BSAI Groundfish FMP was implemented in 2007 (72 FR 52668) , and allocated a portion of the TACs for Atka mackerel, Pacific Ocean perch, and three flatfish species (yellowfin sole, rock sole, and flathead sole), along with an allowance of PSC quota for halibut and crab to the non-AFA trawl catcher/processors (Amendment 80 sector). Amendment 80 also authorized creation of cooperatives which provide greater flexibility for the cooperative members to coordinate both target catch and PSC. This increased flexibility, combined with higher product values for Greenland turbot provided incentives and opportunity for the Amendment 80 sector to target Greenland turbot. However, Amendment 80 did not address BSAI Greenland turbot allocations or limit activity by any sector in the BSAI Greenland turbot fishery.

Under Amendment 80, the trawl sector can target Greenland turbot according to the limited access regulations in place before Amendment 80 was implemented: the fishery is open until TAC is reached at which point Greenland turbot is managed as PSC. If amended MRAs for arrowtooth and Kamchatka flounder are implemented, Greenland turbot could be retained after the directed fishery is closed. It is likely that the implications of Amendment 80 have not yet been fully realized. Amendment 80 allowed the formation of cooperatives to manage directed catch, bycatch, and PSC in the trawl fleet. The Amendment 80 cooperatives targeting arrowtooth and Kamchatka flouder used this cooperative management structure to implement voluntary measures to limit Greenland turbot catch in 2011, after the closures in 2009, and 2010. These management measures included restrictions on directed fishing or topping off on Greenland turbot, area restrictions on arrowtooth and Kamchatka flounder fishing to avoid areas of high Greenland turbot abundance, and restrictions on arrowtooth fishing in certain areas once Kamchatka flounder closes to direct fishing. The Greenland turbot fishery did not close in the BSAI in 2011. A portion of the Amendment 80 sector that catches Greenland turbot has been in negotiations with the Freezer Longline Coalition to design cooperative measures to limit Greenland turbot catch in the Amendment 80 sector. It is possible that non-regulatory means such as these could alleviate the pressure

on the existing Greenland turbot TAC and prevent closures to directed fishing. Although the directed fishery remained open in 2011, some concern remains that if the value of Greenland turbot rises, there may be incentive for vessels that are not part of the current negotiations to enter the Greenland turbot fishery, and the directed fishery could again be closed (K. Down, Pers. Comm. May, 2012).

Purpose and Need

The Council has not crafted a purpose and need statement for this action. The October, 2011 presentation from the Freezer Longline Coalition included a draft purpose and need statement and alternatives for consideration that identified the longline sector's history and dependence on the Greenland turbot fishery. Should the Council initiate a formal analysis of the proposal, it would need to approve a purpose and need statement.

Potential Alternatives and Discussion

The Freezer-Longline Coalition proposal was developed to alleviate the perceived conflict between the longline and trawl sectors for access to the Greenland turbot TAC. If the Council initiates an analysis of this proposed action, analysts would evaluate these alternatives, and other potential alternatives that could address this perceived conflict. The Freezer-Longline Coalition proposal included two options: the no-action alternative and an alternative to divide the Bering Sea and Aleutian Islands TAC between trawl and fixed gear using historical catch. Alternative 2 suggests three options for historical catch to allocate Greenland turbot TAC in both the Bering Sea and Aleutian Islands subareas, with other years to be added by industry request:

I. 2002-2007
II. 2002-2007: Best 5 years
III. 2002-2007: Best 3 years.

For the years 2002 – 2007, the fixed gear sector harvested approximately 70% – 80% of the BSAI Greenland turbot. The selection of years included to determine historical catch is the area of obvious importance. The suggested years, 2002 – 2007, are the most recent years before implementation of Amendment 80, and the time of lowest trawl catch between 1977 and 2011. The suggested years also include the period of lowest estimated biomass and TAC for the BSAI Greenland turbot fishery. A different set of qualifying years would result in different sector allocation amounts. The proportion of BSAI Greenland turbot catch accounted for by fixed and trawl gear are shown in Table 5. Should the Council initiate a full analysis of this proposal, a range of years used to base historical catch would be analyzed, according to the Council's wishes.

Table 5. Total (directed and incidental) Greenland turbot catch (mt), and proportion of catch (percentage) for the fixed gear and trawl sectors in the BSAI from 2001 – 2011.

Year	Fixed Gear		Trawl	
	Total catch	Proportion of catch	Total catch	Proportion of catch
2001	3,164	59.6	2,149	40.4
2002	2,603	71.6	1,033	28.4
2003	2,615	73.7	931	26.3
2004	1,583	70.1	675	29.9
2005	1,879	72.1	729	27.9
2006	1,625	81.8	361	18.2
2007	1,544	77.1	458	22.9
2008	984	33.8	1,935	66.2
2009	1,460	31.7	3,080	68.3
2010	2,160	52.2	1,977	47.8
2011	2,019	55.5	1,618	44.5
2001-2011	21,636	59.1	14,946	40.9

The Freezer Longline Coalition proposal also included a provision to roll over (allocate) any unharvested TAC from either sector to the other sector as soon as practicable within the fishery year. This provision would be fully analyzed should the Council wish to initiate a full analysis of this proposal.

Conclusions

The estimated biomass and total catch of Greenland turbot has varied considerably in the BSAI. Low estimates of biomass in the 1990s and 2000s, relative to the late 1970s and 1980s, resulted in low Allowable Biological Catch, and Total Allowable Catch. Since 1992, the fixed gear (longline and pot) sectors have participated as the major harvesters in the BSAI Greenland turbot fishery, although trawl gear dominated the Greenland turbot fishery before then. Increasing biomass estimates, and the likely concomitant increases in TAC may exacerbate conflicts for Greenland turbot TAC between the different BSAI sectors that target Greenland turbot.

Amendment 80 to the BSAI Groundfish FMP appears to have changed the patterns of Greenland turbot harvest. The Amendment 80 sector's catch of Greenland turbot was both higher, and earlier in the season after implementation of Amendment 80, and the directed fishery was closed in the AI in 2008, 2009, and 2010.

In order to prevent future closures to the directed fishery, the Freezer-Longline Coalition requested in October 2011 that the Council initiate a discussion paper to analyze a BSAI Groundfish FMP amendment to split the BSAI Greenland turbot TAC by gear type. The Freezer Longline Coalition submitted a draft purpose and need statement and several alternatives and options for analysis. Should the Council choose to initiate a full analysis of this proposed FMP amendment, the Council would need to craft a purpose and need statement, and an appropriate range of alternatives for analysis. These alternatives would be analyzed in the context of Amendment 80, the full implications of which may not yet be realized, and the proposed changes to the MRAs relative to Kamchatka and arrowtooth flounder which have not yet been implemented. It is possible that regulatory changes such as those requested are necessary to preserve historical fishing opportunities for Greenland turbot, and it is also possible that non-regulatory

mechanisms, such as those implemented by the Amendment 80 sector in 2011, will alleviate the pressures on the Greenland turbot TAC, and allow historic fishing opportunities to continue.

Literature

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