An Overview of the Major Commercial Fisheries in the Unalaska Area that may be Impacted by the *M/V Selendang Ayu* Oil Spill

Report to
Fisheries Work Group

April 15, 2005

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Introduction

This report summarizes the major commercial fisheries that occur in and around the *M/V Selendang Ayu* oil spill-impacted area between December 20, 2004 and March 31, 2005. This information was compiled at the request of the Alaska Department of Environmental Conservation (NTP 1880032807B) to support decision-making during the *M/V Selendang Ayu* oil spill response.

Overview of Major Commercial Fisheries

Dutch Harbor is both the primary port in Unalaska and the largest commercial fishing port in the Pacific. According to the Alaska Department of Commerce, Community and Economic Development, the population of Dutch Harbor/Unalaska has increased 40% in the past decade, from 3,089 in 1990 to 4,366 in 2003 (DCCED, 2003). In addition to these permanent residents, the town supports an estimated additional population of between 6,000 and 10,000 seasonal residents, most of whom are associated with the commercial fishing industry and either work in town for less than 6 months per year or spend the majority of their time offshore on vessels.

Major commercial fisheries in Unalaska include a number of groundfish species, as well as several major crab fisheries and a few smaller food and bait fisheries. The bays and inshore waters of Unalaska Island support a number of commercially-significant groundfish species. Likewise, many vessels that fish in the Bering Sea land their catch at Unalaska or Dutch Harbor processors.

As of 2002, the Alaska Department of Fish and Game (ADFG) reported that the Dutch Harbor district represented the greatest portion of the seafood harvest in southwest Alaska, based both on poundage (48%) and ex-vessel value (44%). From 1998-2002, however, ex-vessel value paid by southwest Alaska processors declined in all areas; at the same time, harvests increased by 14% based on pounds purchased by shore-based processors. In addition, since 1988 the Dutch Harbor district has consistently had equal to or the highest number of processors in the region (SWAMC, 2003).

Commercial Ground Fisheries

Table 1 lists the major commercial fisheries that occur in the Unalaska area and which open to commercial fishing between 1/1/05 and 4/1/05. Additional information on each of these fisheries is provided in subsequent sections of this report.

Table 1 – Commercial ground fishery seasons in Unalaska area

Fishery	Open Date	Close Date	Location of Fishery (See Figure 2)	Estimated 2005 Harvest Level	2004 Catch in Unalaska Area
Pollock "A" Season	1/20/05	3/25/05	Eastern Bering Sea, Aleutian Islands and Bogoslof Exemption Area; Fishing is concentrated in 509, 521, 513, 517 (east of Unalaska, north of Unimak pass) See Figure 1.	E. Bering Sea- 1,478,500 mt; Aleutian Islands- 19,000 mt; Bogoslof- 10 mt (quota is divided 50% catcher; 40% catcher/ processor; 10% mothership)	Not a significant catch effort in immediate Unalaska area, high volume of catch processed in Unalaska and catcher vessels tank down locally
Gulf of Alaska Pollock	1/20/05	Area 610 closed 3/12/05; Area 620 closed 3/20/05	Gulf of Alaska regions 610, 620, 630	15,865 mt	In 2004, 22,148 mt (approx 44% of the 50K mt quota) were landed in area 610, including Unalaska
Pacific Halibut IFQ	2/27/05	Nov. 2005 (at quota)	Bering Sea/Aleutian Islands including inshore waters	73.67 million pounds (includes sport & subsistence take as well)	4.2 million pounds landed in Unalaska, 622K landed in Akutan
Sablefish (black cod) IFQ – federal waters	2/27/05	Nov. 2005 (at quota)	Bering Sea/Aleutian Islands including inshore waters	6,000 mt	4.3 million pounds landed in Unalaska, 258K landed in Akutan
Pacific cod - pot/line gear	1/1/05	Closed in phases from 2/12/05 – 3/10/05 based on gear/vessel specifications	Most of Aleutian Islands/Bering Sea, including inshore areas	2005 total allowable catch (TAC) is 206,000 mt (quota is shared with trawl fleet)	BS/AI total catch was 113,881 mt
Pacific cod – trawl gear "A" season	1/20/05	Closed 3/13, then re-opened 3/29 with 2,400 mt remaining in quota for first seasonal allowance	Bering Sea/Aleutian Islands - concentrated East of Unalaska Island	2005 TAC is 206,000 mt (quota is shared with pot/line fleet)	BS/AI total catch was 81,946 mt
Black Rockfish state waters fishery	1/1/05		There is an active fishery with a small quota in Unalaska area; no boats are currently registered in Unalaska	2005 TAC is 35,000 lbs for Unalaska area	

Commercial Crab Fisheries

Table 2 lists commercial crab fisheries that occur near Unalaska Island and in the Bering Sea/Eastern Aleutian Islands area, and which open to commercial fishing between 1/1/05 and 4/1/05. Additional information on each of these fisheries is provided in subsequent sections of this report.

The Bering Sea red king crab fishery is not included in this table or this report because the fishery did not occur during the emergency response phase of the oil spill and therefore was not a concern for response decision-making.

Table 2 – Commercial crab fisheries in Unalaska area

Fishery	Open Date	Close Date	Location of Fishery (See Figure 4)	Estimated 2005 Harvest Level	2004 Catch in Unalaska Area
Unalaska Tanner (*bairdi)* crab	1/15/05	1/18/05	Unalaska Bay – ADFG statistical area 665335, 665403.	Quota set at 35,304 lbs	47,219 guideline harvest level
Makushin Tanner (*bairdi*) crab	Scheduled to open 1/15/05 but area closed to commercial fishing by ADFG 12/27/04	Never opened in 2005	Makushin ADFG statistical areas 675332, 675331, 665336	Quota set at 171,453 lbs	87,891 guideline harvest level
Bering Sea snow (*opilio*) crab	1/15/05	Quota reached at 1/20/05. Processing completed in Unalaska area 2/6/05	Bering Sea District West of 166° W longitude. Fishery area is at some distance from Unalaska, but large fleet (approximately 170 vessels in 2005) deliver live crab to Unalaska area processors, using re-circulating seawater tanks.	TAC set at 20.9 million lbs	TAC set at 20.8 million lbs
Aleutian Islands Golden (brown) king crab	8/15/04	8/29/04 east of 174° W longitude, 1/3/05 east of 174° W longitude	Aleutian Islands Registration Area "O"		*2005-2005:* 3.0 million lbs east of 174° W longitude (5.7 million lbs total)

Other Commercial Fisheries

In addition to the ground and crab fisheries summarized in Tables 1 and 2, several smaller commercial fisheries occur in the Unalaska area (Table 3).

Table 3. Other commercial fisheries in Unalaska area

Fishery	Open Date	Close Date	Location of Fishery	Estimated 2005 Harvest Level	2004 Catch in Unalaska Area
Pink salmon	No opener scheduled for 2005		Unalaska area salmon streams		Intermittent fishery, last occurred in 1994 when total catch was 49,428 fish
Herring food and bait fishery	Not yet scheduled for 2005—usually in July		Unimak, Akutan, Unalaska (Unalaska Bay), and Umnak districts	1,239 ton quota	1,258 tons harvested (including gillnet, seine, and pound fisheries)

Fishery Fact Sheets

To help the Unified Command and members of the public understand the commercial fisheries at-risk of impacts from the *Selendang Ayu* oil spill, fishery fact sheets were developed and posted to the Unified Command website for the following fisheries:

- Makushin Tanner Crab Fishery
- Unalaska Tanner Crab Fishery
- Bering Sea Snow Crab Fishery
- Bering Sea/Aleutian Islands Pacific Cod Fishery – Pot Gear
- Bering Sea/Aleutian Islands Pollock Fishery "A" Season
- Bering Sea/Aleutian Islands Pacific Cod Fishery – Trawl Gear

Copies of these fishery fact sheets are included as Appendix A to this report.

Bering Sea/Aleutian Islands Pollock "A" Season

The Bering Sea/Aleutian Islands (BS/AI) pollock "A" season is the most economically significant fishery to occur in the Unalaska region. Pollock accounts for three-quarters of all shore-based processing (by weight) in southwest Alaska. The local fleet consists of approximately 60 catcher vessels, 20 factory (catcher/processor) vessels, and 3 mother ships. The 2005 quota for the BS/AI Pollock fishery is split between the "A" season, which runs from January 20 through early April, and the shorter "B" season, which occurs in September and October. The quota is allocated by region, with 1,478,000 metric tons for the Eastern Bering Sea, 19,000 metric tons for the Aleutian Islands, and 10 metric tons for the Bogoslof Islands.

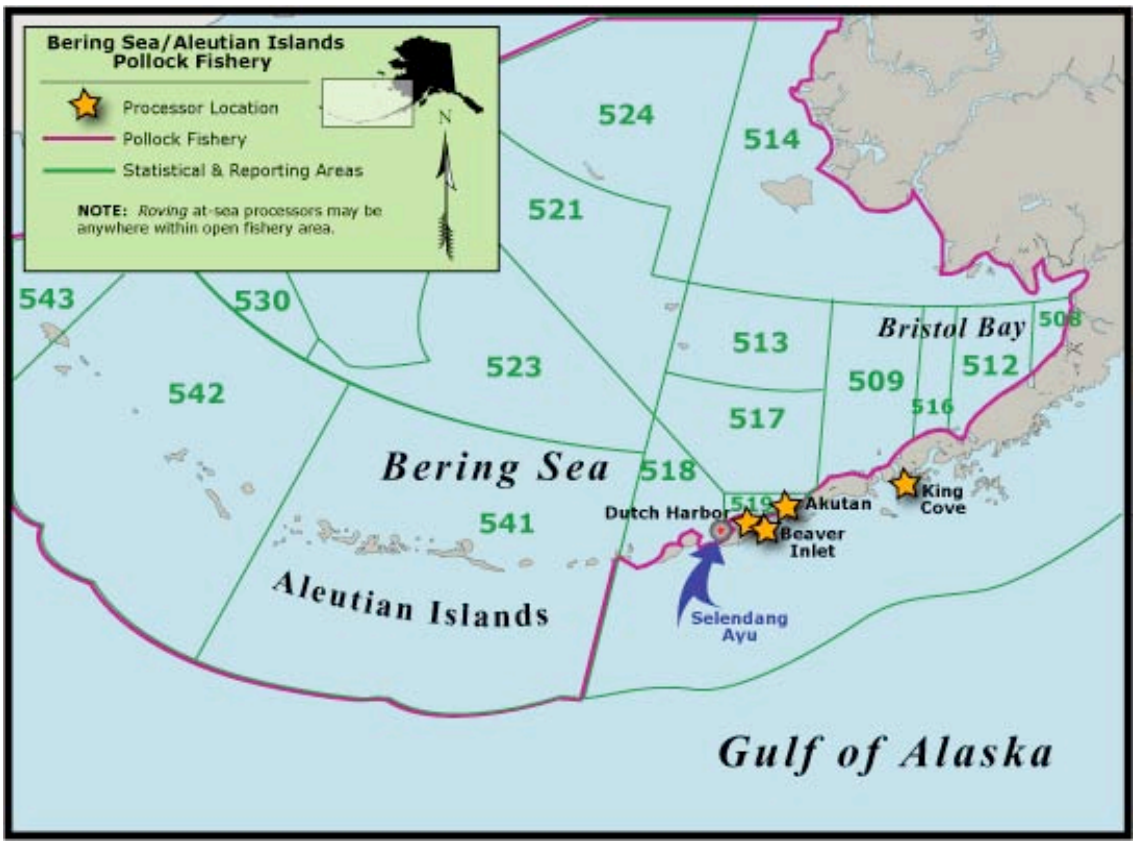
According to the National Marine Fisheries Service (NMFS), the areas of primary fishing effort are located to the north and east of Unalaska - 509, 513, 517, and 521 (Figure 1). While the bulk of the pollock fishery occurs in the Bering Sea, a high percentage of the total catch is processed in Unalaska/Dutch Harbor. The shore-based fleet makes frequent deliveries, usually every 2 days or so, throughout the season. Before returning to sea, most catcher vessels must "tank down" by filling their refrigerated seawater tanks in order to ensure vessel stability while the holds are empty. So, throughout the fishery, catcher vessels will be taking on seawater in Unalaska and Dutch Harbor.

NMFS tracks pollock landings by the statistical area in which they are caught. Table 4 shows the 2004 catch statistics for each area. Area 519, which includes the *Selendang Ayu* spill impact area, had considerably lower catch amounts than other areas of the Bering Sea and Aleutian Islands. A fact sheet for this fishery is attached.

Table 4. **2004 Pollock "A" season catch statistics for Bering Sea/Aleutian Islands statistical *areas*** (Source: Smoker, 2004).

Statistical Area	Total Catch reported, Jan-Mar 2004 (mt)
509	276,653
513	88,003
516	10,531
517	96,579
519	119
521	39,471

Figure 1. Bering Sea/Aleutian Islands Pollock Fishery Open Area



Gulf of Alaska Pollock

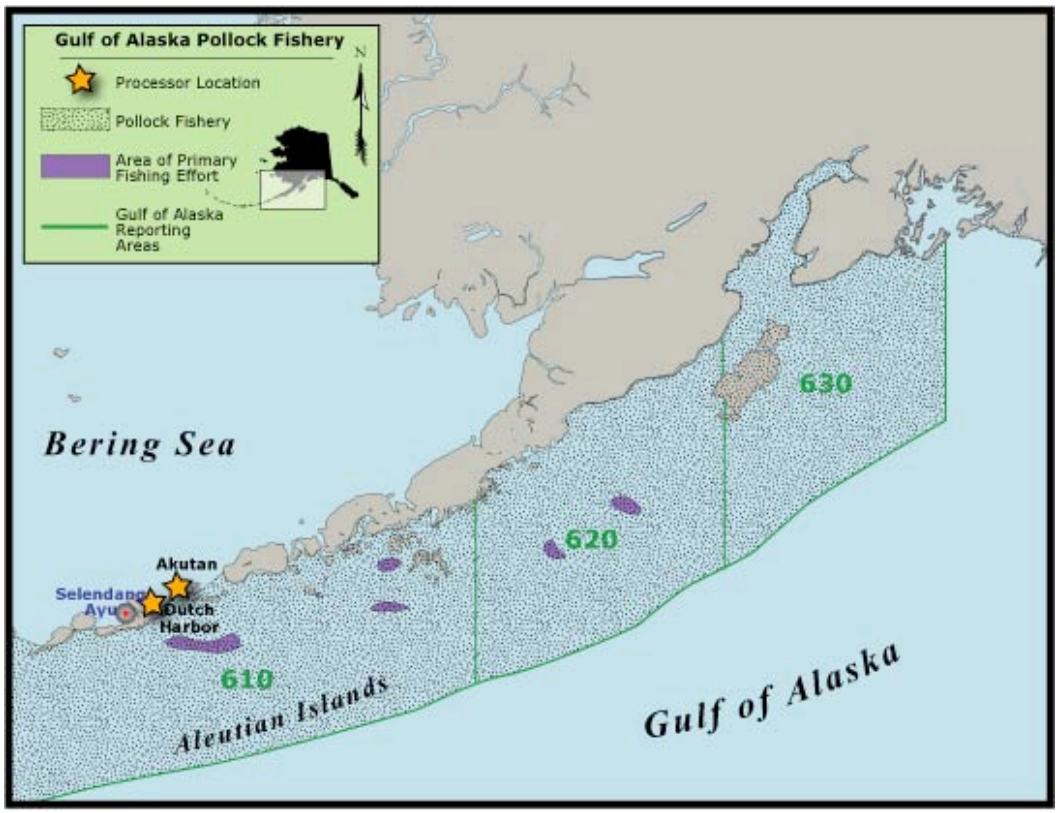
The Gulf of Alaska pollock fishery is considerably smaller than the Bering Sea/Aleutian Islands pollock fishery. In 2004, approximately 44% of the quota was landed in area 610, which includes Unalaska (Figure 2). NMFS data indicates that the area to the southeast of Unalaska Island experiences significant fishing pressure by the Gulf of Alaska fleet. However, the total volume of pollock landed in this fishery is only a fraction of the larger Bering Sea/Aleutian Islands take (Table 3).

The Gulf of Alaska pollock fishery occurs in four seasonal openings over the course of a calendar year, and is further subdivided by gear type (pot/hook line and trawl). By regulation, this fishery is limited to vessels that deliver their catch at-shore; there is no catcher/processor or at-sea processing component. Pollock caught in area 610 is landed in both Unalaska and Akutan. The first seasonal opening, for Area 610, occurred January 1 for pot/hook and line gear and January 20 for trawl gear, and is now closed. Statistics for the 2004 fishery are included in Table 5.

Table 5. 2004 Gulf of Alaska pollock catch by reporting area *(Source: Smoker, 2004)*

Reporting Area	Number of Vessels	Total Catch Reported (mt)
610	25	22,148
620	47	20,659
630	36	7,658

Figure 2. Gulf of Alaska Pollock Fishery Management Areas



Pacific Halibut IFQ Fishery

The Pacific halibut fishery is managed under an individual fishing quota (IFQ) system where the TAC is allocated according to individual shares in the fishery. This system is meant to avoid disruptive changes in the composition of the fishing fleet and to maintain a broad distribution of quota shares among people who are actively involved in the fishery. The halibut fishery also includes community development quotas (CDQ) which are specifically allocated to local coastal communities to preserve their access to the fishery resources.

The Pacific halibut fishery opening date was established by the International Pacific Halibut Commission (IPHC) as February 27, 2005. The management areas for Pacific halibut are also established by the IPHC, although NMFS tracks landing data and actively manages many aspects of the fishery. Unlike many other Alaska fisheries, the commercial halibut season will occur over a period of several

months, with catch levels starting out low and peaking in the summer months. According to NMFS daily landing data for 2004, halibut landings in Area 4A, which includes Unalaska (Figure 3), were lowest in March (NMFS, 2004a). They gradually increased until they peaked in July, and then gradually decreased through the end of the season in mid-November (Table 6). While there is limited information available regarding specific locations where halibut was caught, a total of 2.3 million pounds was landed in Unalaska/Dutch Harbor in 2004, accounting for approximately 68% of the total landings for Area 4A (Table 7).

Figure 3. International Pacific Halibut Commission Reporting Areas *(Source: IPHC, 2005)*

Table 6. Approximate monthly halibut landings for Area 4A, 2004 *(Source: compiled from data in NMFS, 2004a. All values are approximate)*

Month	Estimated Pacific Halibut Landings
March 2004 (2/29/04-4/1/04)	53,000 lbs
April 2004 (4/2/04-5/4/04)	77,000 lbs
May 2004 (5/5/04-6/6/04)	360,000 lbs
June 2004 (6/7/04-7/9/04)	658,000 lbs
July 2004 (7/10/04-8/11/04)	950,000 lbs
August 2004 (8/12/04-9/13/04)	846,000 lbs
September 2004 (9/14/04-10/16/04)	378,000 lbs
October 2004 (10/17/04-11/18/04)	90,000 lbs
November 2004[1] (11/19/04-11/21/04)	0

Table 7. Total landings by port for Area 4A, 2004 *(Source: NMFS, 2004b)*

Port of Landing	Vessel Landings	Total Catch (pounds)	Percent of Area Catch
Adak	N/A	1,026	.03%
Akutan	39	343,454	10.13%
Dutch Harbor/Unalaska	225	2,304,136	67.93%
Homer	10	349,300	10.3%
King Cove	7	136,075	4.01%
Kodiak	N/A	39,710	1.17%
Sand Point	12	195,479	5.76%
Seward	N/A	22,855	0.67%
Area Total	**299**	**3,392,035**	**100%**

[1] Note that October 2004 catch statistics represent harvest through 11/18/04. The fishery closed on 11/21/04.

Spatial Distribution of Halibut Fishery

Although the halibut landing statistics recorded by NMFS do not specify where the fish were caught, the inshore groundfish landing statistics for non-halibut species may provide some insight into areas near the *Selendang Ayu* wreck that may be heavily fished by both the halibut and sablefish IFQ fisheries.

The non-halibut groundfish catch for the Unalaska Island area (Table 8) consists primarily of rockfish, skate, and cod species taken incidental to the halibut and sablefish IFQ fisheries in this area. By far, the area with the highest catch level for non-halibut groundfish is 675333, which includes the federal waters immediately outside of Makushin Bay, Skan Bay, and western Unalaska Island (see Figure 4 for reporting area locations). Since most of the non-halibut landings recorded in Table 8 reflect incidental harvest that occurs during halibut and sablefish target fisheries, this may be considered as indirect evidence that area 675333 is the most heavily fished area for halibut and sablefish near the spill impact zone.

The IPHC also tracks landing data, and provides information regarding the total numbers of vessels fishing and catch landed in IPHC statistical area 533167 (Figure 5), which includes the spill impact area as well as areas south to Umnak Pass and north to Koriga Point. Table 8 shows the total catch in pounds from 1999-2003 for area 533167, by time of year. Table 9 shows the numbers of vessels fishing in this area from 1999-2003, by time of year. Data for 2004 had not yet been compiled at the time of publication. Specific catch levels for Makushin Bay are not available due to confidentiality considerations (Blood, 2005).

Table 8. Non-halibut groundfish areas in Unalaska area, 2004 *(Source: Morrison, 2005)*

State Reporting Area	Location	2004 Non-Halibut Groundfish Landings (pounds)
665336	Makushin Bay	16,300
675304	Umnak Pass	48,000
675305	South of Skan Bay	16,000
675331	Mouth of Makushin Bay and north around Unalaska Island	76,300
675333	Makushin/Skan/Unalaska area beyond state waters	754,300
675334		30,000
	Total	**940,900**

Figure 4 – ADFG Reporting Areas for Unalaska Island Area

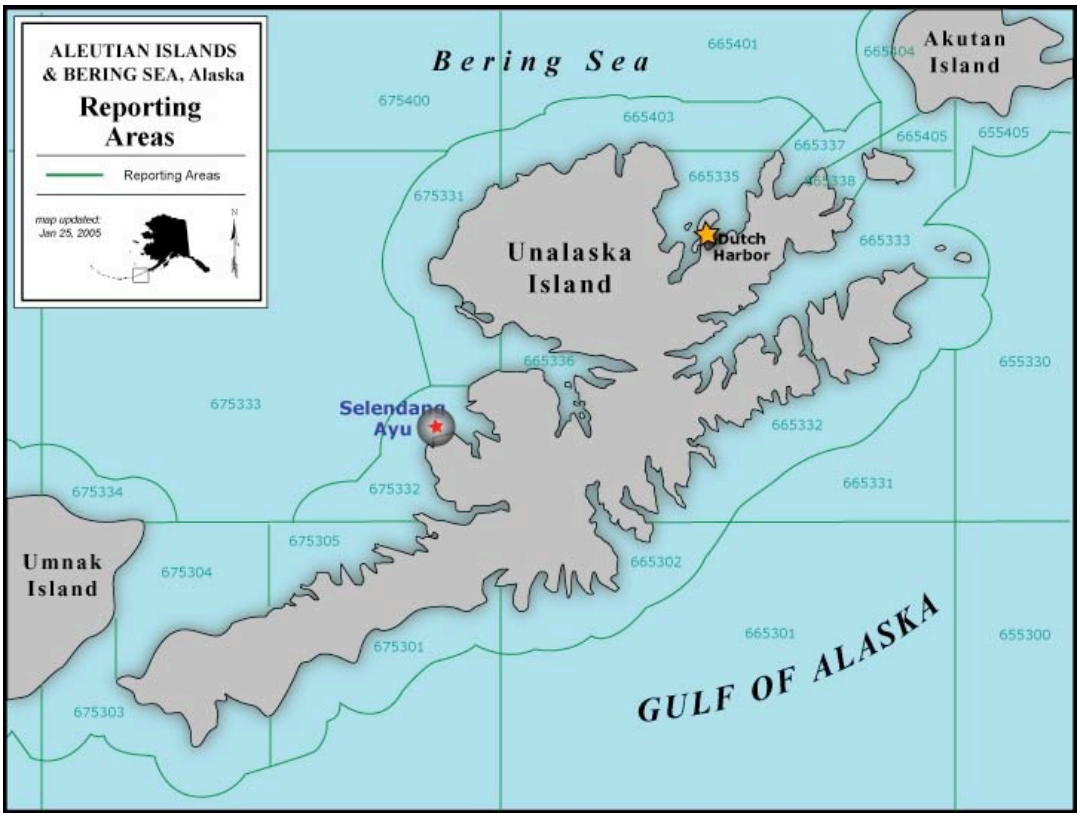


Table 9. Halibut catch (net weight pounds) in IPHC Area 533167 by year, including estimated catch from Makushin Bay *(Source: Blood, 2005)*

Year	Mar-May	Jun-Aug	Sep-Nov	Grand Total
1999	65,685	411,571	65,183	542,439
2000	26,560	572,062	56,447	655,069
2001	55,235	523,625	78,475	657,335
2002	16,234	508,568	82,856	607,658
2003	51,942	504,912	91,411	648,265
Grand Total	215,655	2,520,738	374,373	3,110,766

Figure 5 – IPHC Statistical Area 533167 *(Source: Blood, 2005)*

Selendang Ayu area of concern in relation to IPHC Statistical Area 533167

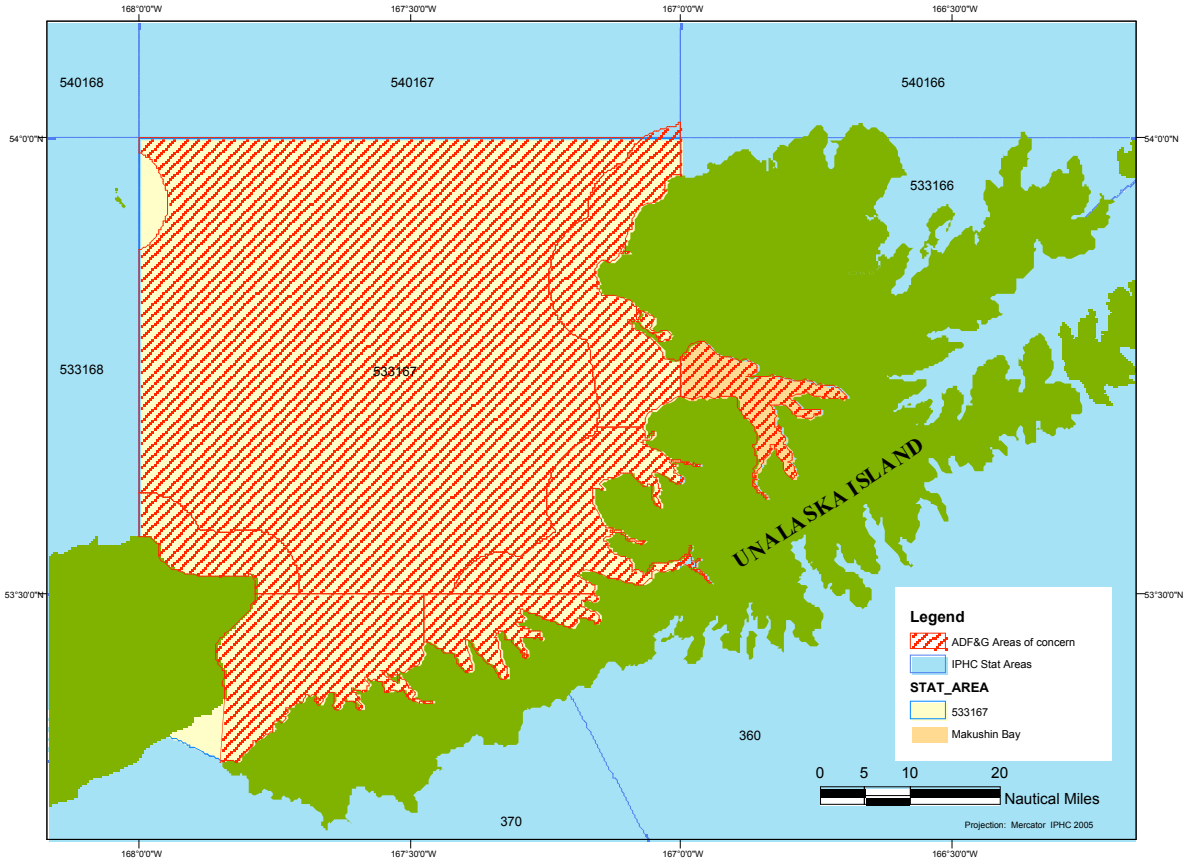


Table 10. Numbers of distinct vessels fishing in IPHC Area 533167 by year, including estimated numbers of vessels in Makushin Bay *(Source: Blood, 2005)*

Year	Mar-May	Jun-Aug	Sep-Nov
1999	9	24	6
2000	6	30	9
2001	6	41	11
2002	5	37	12
2003	6	37	15

Sablefish IFQ Fishery

The sablefish (black cod) fishery is a federal fishery also managed under an IFQ system. The 2005 season will run from late February through December. Gear types include longline, bottom trawl, pot, and midwater trawls. Like the halibut fishery, the 2004 sablefish catch statistics show monthly catch rates increasing as the season progressed, although sablefish landings peaked in May 2004, earlier than halibut (Table 11).

Landing statistics on sablefish IFQ are recorded by region, as shown in Figure 6. Sablefish landed in Dutch Harbor/Unalaska may be caught almost anywhere in the state (Table 12). Total sablefish landings for the Aleutian Islands area for 2004 totaled just over 2 million pounds. Total landings for the Bering Sea totaled approximately 1.16 million pounds (Table 13). Over 80% of the sablefish caught in the Bering Sea and Aleutian Islands were landed in Dutch Harbor/Unalaska in 2004 (Table 12).

In addition to the federal IFQ fishery, there is a separately-managed state waters fishery for sablefish. A guideline harvest level (GHL) is set by ADFG for state waters in the Aleutian Islands management area, which includes the Unalaska area. This fishery does not open until May 15, 2005, and the GHL has not yet been set, but is usually established at or below 5% of the federal catch level for the area.

In 2004, approximately 37,000 pounds of sablefish were caught in state waters in the Unalaska and Umnak Island region. This amounts to approximately 8% of the 480,000 GHL for the fishery in the Aleutian Islands. Of the harvest in the Unalaska area, approximately 27,000 pounds were caught in Umnak Pass, therefore the Umnak Pass area is presumed to have the highest concentration of sablefish harvesting activity, although it is still a small fraction of the total Aleutian Islands fishery. Because of its timing and location, this fishery is not included in Table 1 and was not a primary concern for response decision-making during the *Selendang Ayu* oil spill.

Table 11. Monthly sablefish IFQ landings/year in pounds and percent of annual IFQ TAC ***(Source: NMFS, 2004c)***

Month	Landings	Percent of TAC
March 2004	704,421	1.9%
April 2004	3,877,994	10.2%
May 2004	8,479,167	22.4%
June 2004	6,940,949	18.3%
July 2004	3,629,275	9.6%
August 2004	2,783,592	7.3%
September 2004	3,326,236	8.8%
October 2004	2,201,799	5.8%
November 2004	1,616,901	4.3%
December 2004	134,982	0.4%
Totals	**33,695,316**	**88.8%**

Figure 6. Sablefish IFQ Management Areas *(Source: Muse, et al., 1996)*

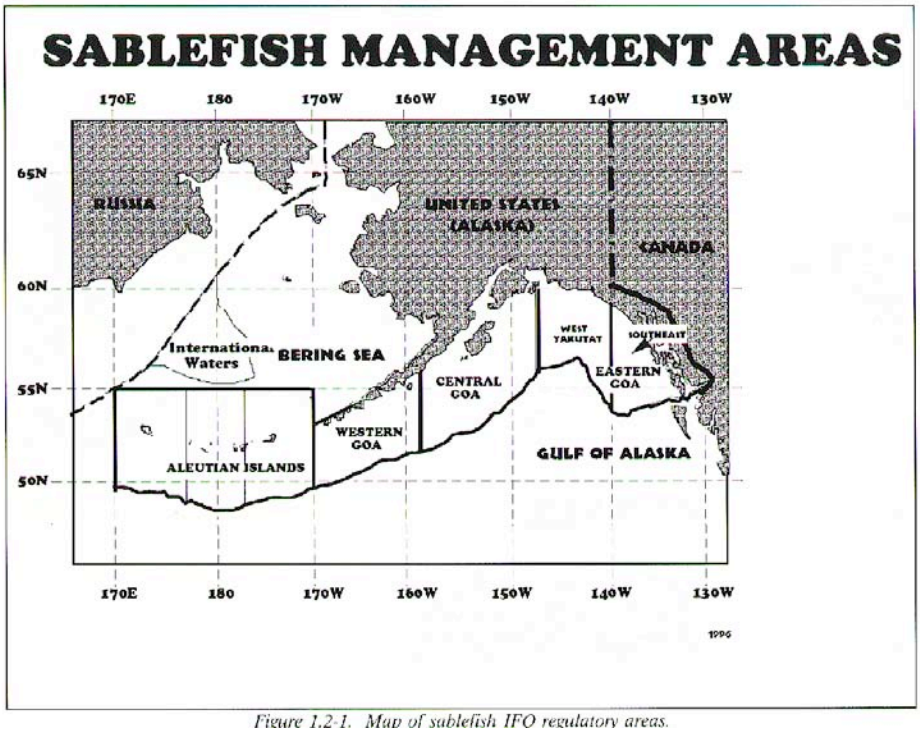


Figure 1.2-1. Map of sablefish IFQ regulatory areas.

Table 12. Sablefish IFQ landings in Dutch Harbor/Unalaska by management area where caught, 2004 ***(Source: Muse, et al., 1996)***

Sablefish Management Area where caught	Dutch Harbor/Unalaska Landing total for 2004		Percent of Area Total
	# Vessels	Pounds	
Aleutian Islands	68	1,739,384	83.45%
Bering Sea	120	940,596	81.22%
Central GOA	9	493,918	3.89%
Southeast Alaska	N/A	23,175	0.28%
Western GOA	38	1,126,474	24%
West Yakutat	N/A	67,300	1.38%

Table 13. Sablefish IFQ landings by management area, 2004 *(Source: NMFS, 2004d)*

Sablefish Management Area	Vessel Landings	2004 Catch (pounds)	Percent of Total 2004 Catch
Aleutian Islands	119	2,084,314	6.2%
Bering Sea	139	1,158,053	3.4%
Central GOA	650	12,713,109	37.7%
Southeast Alaska	701	8,172,370	24.3%
Western GOA	217	4,692,786	13.9%
West Yakutat	251	4,874,684	14.5%
Totals	**2,077**	**33,695,316**	**100%**

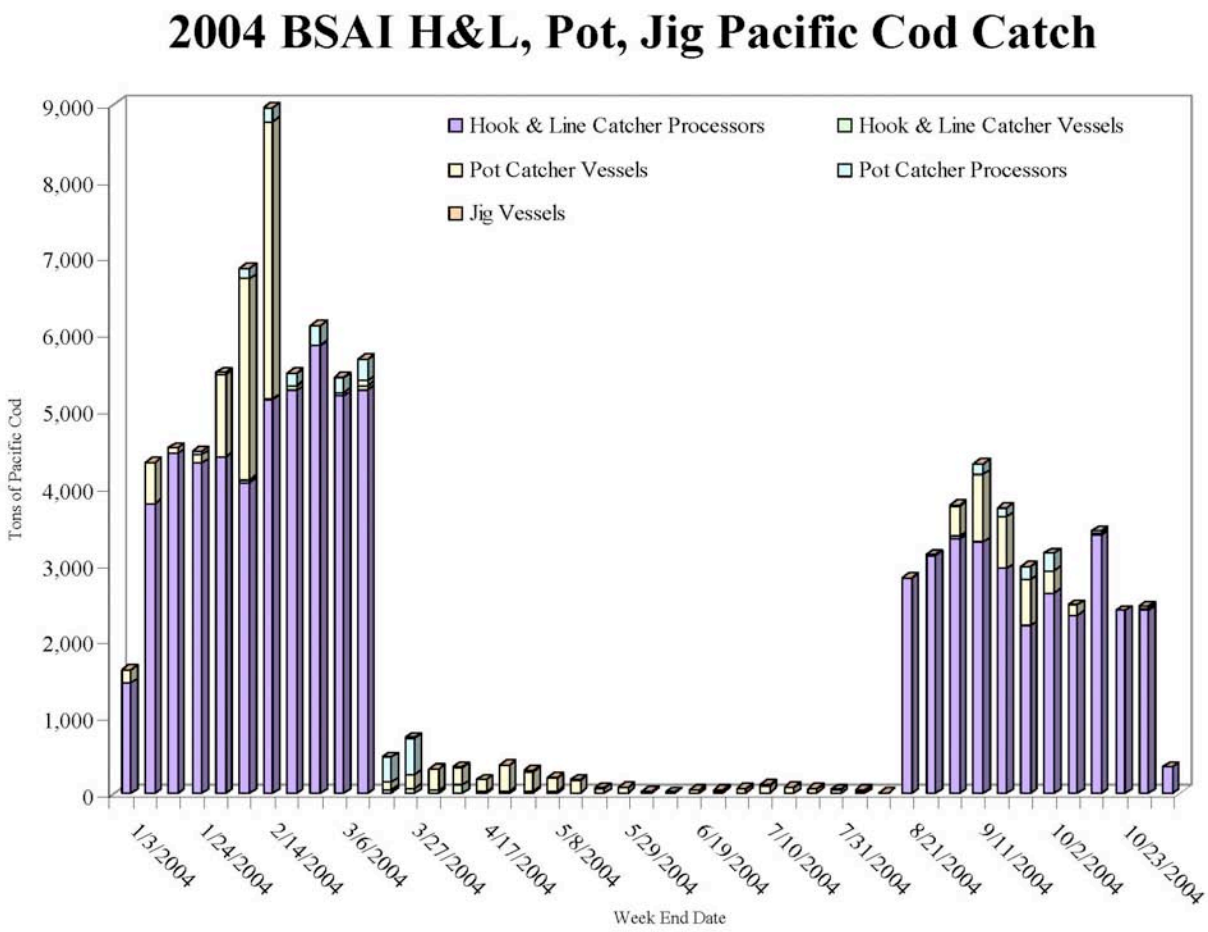
Pacific Cod Hook and Line/Pot/Jig Gear

The hook and line, jig and pot fisheries for Pacific cod opened on January 1, 2005. The early landings in this fishery come primarily from hook and line vessels (both catchers and catcher-processors). The pot fishery generally picks up once the *opilio* crab fishery has closed, as many vessels participate in both fisheries.

The fishery closed on February 13, 2005 for catcher vessels 60 feet and longer using pot gear; February 22, 2005 for catcher/processors using hook-and-line gear; and March 10, 2005 for catcher vessels 60 feet and longer using hook-and-line gear (NOAA, 2005).

Available NMFS catch statistics classify Pacific cod landings by gear type but are not specific regarding the catch area (Figure 7). A fact sheet for the pot gear fishery is attached.

Figure 7. Catch Level for 2004 Pacific Cod Pot/Hook and Line Fishery *(Source: NMFS, 2004e)*

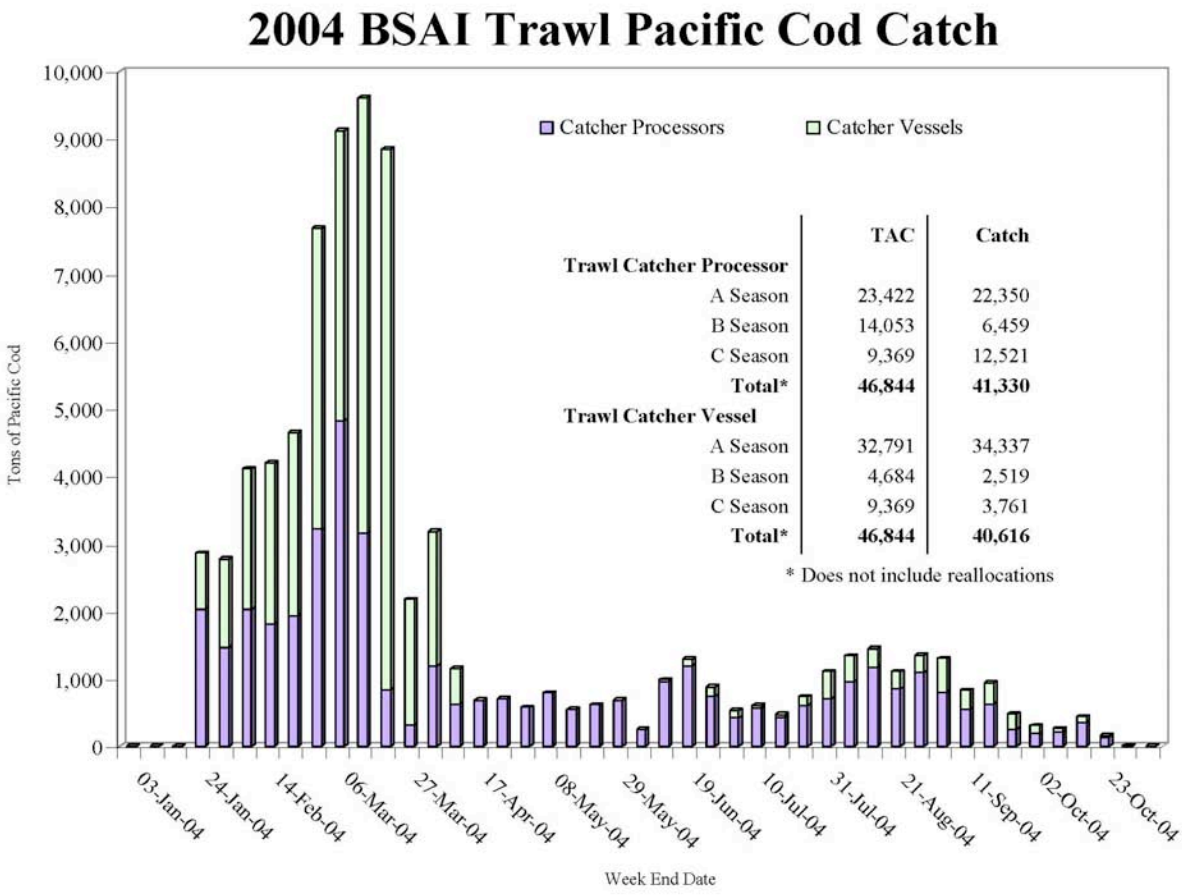


Pacific Cod Trawl Gear

The Bering Sea/Aleutian Islands Pacific cod trawl fishery opened on January 20, 2005. Approximately 10-20 vessels in the Unalaska area participate in this fishery. The Pacific cod trawlers are configured similarly to the pollock fleet, which means that they use refrigerated seawater tanks to hold their catch. Like the pollock fleet, the Pacific cod fleet will "tank down" at the processor before returning back to the fishing grounds, which means it is vulnerable to oil contamination during this process.

The Pacific cod trawl season usually ends in late March/early April. The remaining catch (Figure 8) occurs as incidental catch during other fisheries. A fact sheet for this fishery is attached.

Figure 8. Catch Levels for 2004 Pacific Cod Trawl Fishery *(Source: NMFS, 2004e)*



Other Groundfish Species

Several other ground fisheries are open to commercial harvest in the Eastern Aleutian Islands, including Unalaska Island. These species include black rockfish, yellowfin sole, rock sole, flathead sole and several other species that are primarily landed as bycatch to other target fisheries (e.g. Atka mackerel, Pacific ocean perch, other rockfish species).

There is a small state fishery for black rockfish in the Unalaska area. The fishery opened on January 1, and according to ADFG, there are no vessels registered in this fishery yet for 2005. None of the 35,000 GHL was landed in the Unalaska region in 2003. 2004 statistics are not yet available. Statistics from previous years are confidential due to the limited number of vessels that participated in the fishery.

There are several other federal flatfish fisheries that occur in the Bering Sea. The yellowfin sole fishery includes as many as 21 catch/processors and is a staple fishery for the large, high-volume vessels. The fishery is managed in three seasonal disbursements which are usually determined by halibut mortality caps. The rock sole and flathead sole fisheries are similar in nature, although those fish are higher value and catch levels are usually lower. As Table 14 shows, these flathead fisheries occur well north of Unalaska Island (See Figure 1 for map of reporting areas). Catch levels in Area 519, which includes Unalaska, were quite low. The yellowfin sole fishery was closed to directed fishing on March 16, 2005 to avoid exceeding the 2005 bycatch allowance of red king crab.

Table 14. Flatfish catch levels in Bering Sea/Aleutian Islands, 2004 *(Source: Smoker, 2004)*

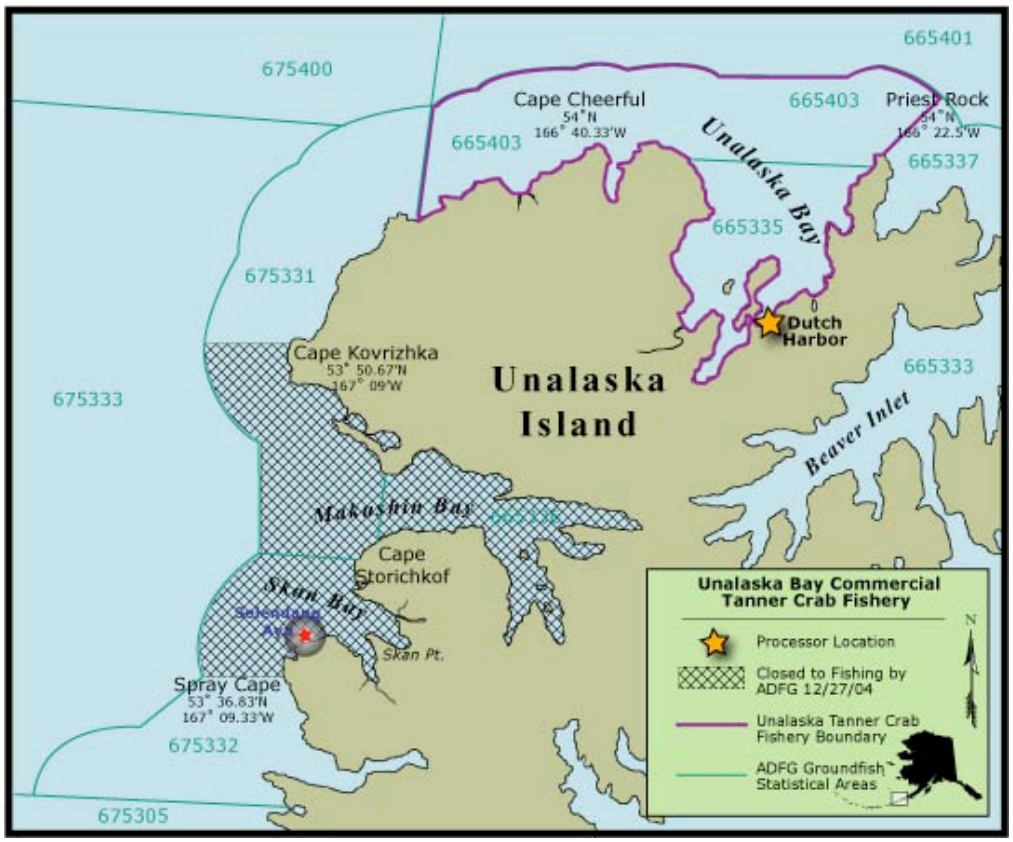
Reporting Area	Total 2004 landings yellowfin sole, rock sole, flathead sole, and "other" flatfish targets
509	40,209 mt
521	36,808 mt
514	30,732 mt
513	30,501 mt
516	14,835 mt
524	11,005 mt
517	4,068 mt
519	801 mt

Tanner (*Bairdi*) Crab Fishery

The Tanner crab fishery occurs in two areas of the state waters around Unalaska Island. The Unalaska Bay component of the fishery occurs in ADFG statistical areas 665335 and 665403 (Figure 9). The Makushin area component of the fishery occurs in ADFG statistical areas 675332, 675331, and 665336 (Figure 9). Both are managed by ADFG with the same opening and closure dates, although distinct quotas are set for the Unalaska Bay and Makushin Bay areas. In 2005, the quota for Unalaska Bay was set at 35,304 lbs and the Makushin quota at 171,453 lbs.

On December 27, 2004, the Alaska Department of Fish and Game closed the Makushin component of the Tanner crab fishery as part of the commercial fisheries closure in the *Selendang Ayu* spill impact area (ADFG, 2004). The Unalaska Bay fishery proceeded as scheduled; quota was caught in approximately 3 days. The regulatory closure date for both fisheries is March 31, 2005. A fact sheet for the Unalaska Tanner crab fishery is attached.

Figure 9. Tanner Crab Fishery Locations near Unalaska Island



Bering Sea Snow (*Opilio*) Crab Fishery

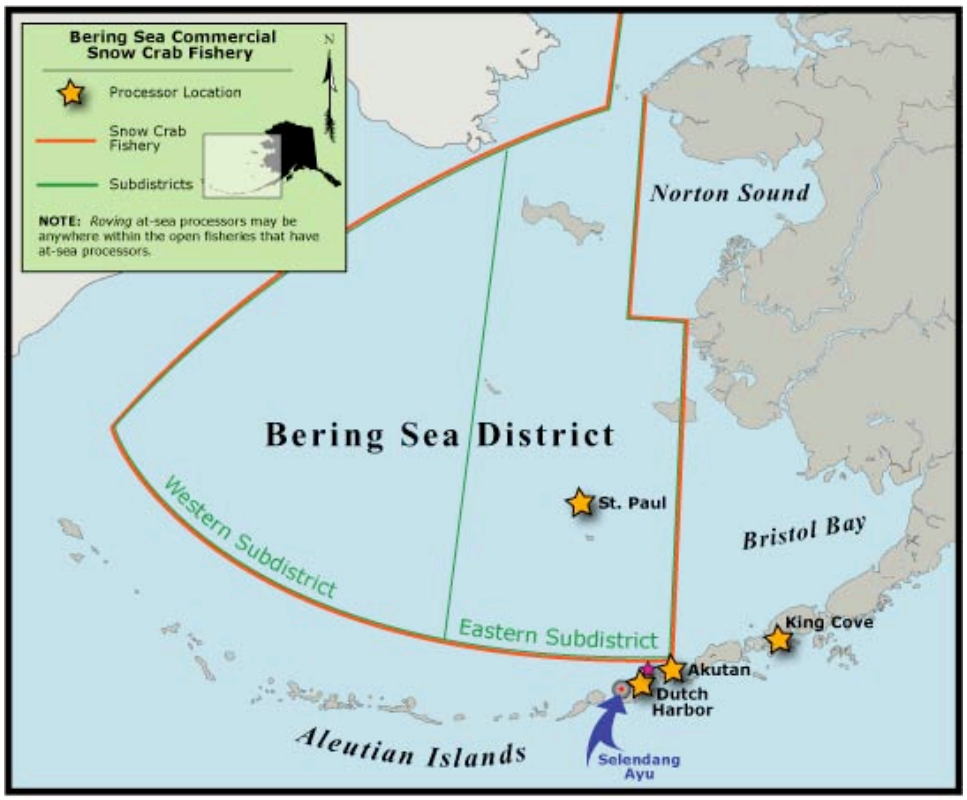
The Bering Sea District of the Bering Sea snow crab fishery is located to the north and east of Unalaska Island (Figure 10). Shore-based processors are located at St. Paul Island, Akutan, Dutch Harbor, and King Cove. Catcher-processors and at-sea processors are also used, some of which anchor in Unalaska Bay. This is a state-run fishery.

A total of 171 vessels was permitted to register by the December 27, 2004 deadline, with a guideline harvest level of 20.9 million pounds. Of the total, 1.57 million pounds are available to the CDQ fishery. Vessels of 125 feet or less had a limit of 70 pots, while longer vessels had a limit of 90 pots.

The 2004 guideline harvest level (GHL) was 20.8 million pounds, with the actual catch at 23.9 million pounds. Last year, 189 vessels participated. (Hughes, 2004)

The season opened on January 15, 2005 with no restrictions resulting from the *Selendang Ayu* spill. Unified Command issued an advisory to the Bering Sea snow crab fleet recommending vessels obtain the latest water quality sampling data from processors prior to returning to port with re-circulating seawater holds. Dutch Harbor vessels were given the option of landing in Beaver Inlet and associated bays prior to unloading. The 2005 fishery closed on January 20, 2005. A fact sheet for this fishery is attached.

Figure 10. Bering Sea Snow Crab Fishery Locations near Unalaska Island



Commercial Salmon Fisheries

Commercial fishing for salmon in the Unalaska area is extremely limited. There is an intermittent commercial fishery that targets pink salmon, depending on the strength of the return (Schwarz, 2002). Over the past 11 years, commercial salmon fisheries in Unalaska Bay have occurred during 2 years. During 1990 and 1994, when fisheries occurred, the harvests were 38,320 and 49,430 pink salmon, respectively (Table 15).

Table 15. Unalaska Bay commercial salmon harvest in numbers of fish, 1990-2001 *(Source: Schwarz, 2002)*

Year	Chinook	Sockeye	Coho	Pink	Chum
1990	0	81	3	38,323	188
1991	0	0	0	0	0
1992	0	0	0	0	0
1993	0	0	0	0	0
1994	0	41	0	49,428	138
1995	0	0	0	0	0
1996	0	0	0	0	0
1997	0	0	0	0	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	0	0	0	0	0
2001	0	0	0	0	0
1991-2000 Average	0	11	0	7,977	30

Herring Food and Bait Fishery

The Dutch Harbor herring food and bait fishery is managed as part of the Togiak herring roe fishery, with the Dutch Harbor fishery allowed 7% of the TAC. Management of the fishery is determined by pre-season spawning biomass projections, which are based on both aerial surveys and age-structured analysis.

The herring food and bait fishery is allowed only in the eastern Aleutian Islands section of the Alaska Peninsula-Aleutian Islands Management Area, which includes Unalaska, Akutan, Unimak, Umnak, and the newly-designated Adak district. In 2004, the fishery took place entirely within Unalaska Bay (see Figure 11). The total ex-vessel value of the 2004 fishery was $375,000; it was characterized as "slow," with several unsuccessful sets and relatively small schools of herring in the area (Duesterloh, 2004).

Figure 11. Area Open to Fishing in 2004 Dutch Harbor Herring Food and Bait Fishery (Source: Duesterloh, 2004)

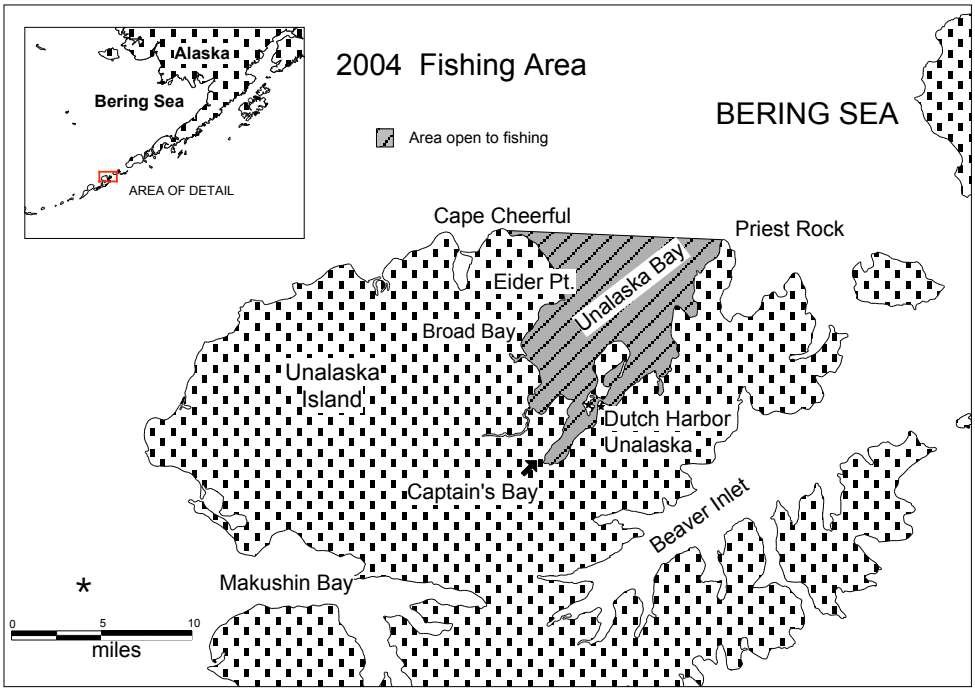


Table 16. Dutch Harbor herring food and bait fishery allocations and commercial harvests for all gear types, in short tons 2001-2004 (Source: Duesterloh, 2004)

	2001	2002	2003	2004
Preseason Togiak spawning biomass	119,818	120,196	126,213	143,124
Allocation	1,572	1,578	1,662	1,899
Harvest	1,439	2,751	1,487	1,258

Table 17. Dutch Harbor herring food and bait fishery harvests (in short tons) and effort by gear type, 2001-2004 (Source: Duesterloh, 2004)

Fishery		2001	2002	2003	2004
Gillnet	Allocation	110	110	116	266
	Harvest	107	134	108	216
	Vessels	6	13	13	7
	Landings	25	37	23	37
	Days fished	9	16	5	12
Seine	Allocation	1,462	1,468	1,546	1,533
	Harvest	1,332	2,617	1,379	1,035
	Vessels	14	16	14 (a)	3 (b)
	Landings	16	14	16	20
	Days fished	2	1	2	9
Seine Pound	Allocation				100
	Harvest				6
	Vessels				1
	Landings				1
	Days fished				1

(a) 14 permit holders used 6 vessels in a cooperative fishery
(b) 16 permit holders used 1 vessel in a cooperative fishery

Assessing Potential Commercial Fishery Impacts

There are multiple potential exposure pathways through which commercial fish species may be exposed to spilled oil. The major commercial fish species at risk of oil impacts from the *Selendang Ayu* include snow and Tanner crab, pollock, Pacific cod, halibut, and sablefish. Other important fishery species, such as herring and salmon, are also vulnerable to oil impacts, however the fisheries themselves are less economically significant. Many of the at-risk commercial fishery species are also utilized for sport and subsistence; however, for the purposes of this report, recreational and subsistence use have not been considered.

With the exception of pollock, the major commercial finfish species considered in this report are all ground fish, which means they live the majority of their adult life on the seafloor. Crab are also benthic organisms, while pollock are a mid-water fish species. For all commercial fish species discussed herein, contact with whole oil is a primary pathway of exposure in the marine environment. All fish species may also absorb dissolved phase oil that is present in the water column.

Crab catcher vessels in both the Tanner and snow crab fisheries utilize live hold tanks, which continually pump seawater to keep the crab alive until they are delivered at processors. This configuration makes this fishery especially vulnerable to whole oil in the water column, as it may enter the seawater circulation systems on these vessels and contaminate the holds. Since the pollock and Pacific cod fleets both utilize refrigerated sea water tanks, those fisheries are vulnerable to oil impacts if floating oil enters the seawater intake of catcher vessels. Whole or dissolved phase oil in the water column may also contaminate the seawater intakes of Unalaska seafood processing plants.

Another exposure pathway is through contamination of pot fishing gear used in the Tanner crab and Pacific cod fisheries in Unalaska Bay and other inshore waters. Contact with contaminated sediments is also a potential exposure pathway for groundfish and crabs. These organisms may be exposed to contaminated sediments that are re-suspended into the water column (especially in areas adjacent to oiled beaches and after storms), or they may have other forms of direct contact with contaminated sediments, including ingestion.

Table 16 describes potential vulnerabilities for each of the fisheries considered in this report.

Table 16. Potential vulnerabilities of each fishery to spill impacts

Fishery	Proximity to Spill Impact Area	Potential Vulnerabilities
BS/AI Pollock	Fishery concentrated in areas east of Unalaska, north of Unimak Pass.	• Fleet that delivers to Unalaska processors will tank down in Bay – floating oil in bay could enter RSW tank. • Large, mid-water trawling nets are used to catch fish and could also ensnare floating tarballs. However, fishing area is distant from spill site and no evidence to date suggests that tarball distribution is that widespread. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
GOA Pollock	Occurs in Gulf of Alaska, immediately south of Aleutian chain. No oil has been encountered in the GOA to date.	• Fleet that delivers to Unalaska processors will tank down in Bay – floating oil in bay could enter RSW tank. • Large, mid-water trawling nets are used to catch fish and could also ensnare floating tarballs. However, there is no evidence to date of tarballs in the GOA or areas south of Unalaska Island. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.

Fishery	Proximity to Spill Impact Area	Potential Vulnerabilities
Pacific Cod – Pot/Line	Commercial fishing occurs in inshore waters, including Makushin closed area, spill impact area, Unalaska Bay, and adjacent areas.	• Fleet that delivers to Unalaska processors may tank down in Bay – floating oil in bay could enter RSW tank. • Fishery includes areas where floating oil has been encountered and areas adjacent to known oiled beaches. • Fish are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Pacific Cod - Trawl	Fishery concentrated in areas east of Unalaska, north of Unimak Pass.	• Fleet that delivers to Unalaska processors will tank down in Bay – floating oil in bay could enter RSW tank. • Fish are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Fishing area further offshore than pot/line fleet. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Halibut IFQ	Commercial fishing occurs in federal & inshore waters, including Makushin closed area, spill impact area, Unalaska Bay, and adjacent areas. Large percentage of annual harvest is landed in Dutch Harbor/Unalaska. Bycatch landing records indicate that the area just outside state waters adjacent to the spill is heavily fished.	• Fishery includes areas where floating oil has been encountered and areas adjacent to known oiled beaches. • Fish are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Fishery occurs over several months and seasons – lengthened period of potential exposure. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.

Fishery	Proximity to Spill Impact Area	Potential Vulnerabilities
Sablefish IFQ & State Fishery	Commercial fishing open in federal and state waters, including Makushin closed area, spill impact area, Unalaska Bay, and Umnak Pass. Bycatch landing records for federal fishery indicate that the area just outside state waters adjacent to the spill may be heavily fished. Most inshore fishing in Umnak Pass and west.	• Fishery includes areas where floating oil has been encountered and areas adjacent to known oiled beaches. • Fish are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Fishery occurs over several months and seasons – lengthened period of potential exposure. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Makushin Bay Tanner Crab	Fishery within spill impact area. Closed for 2005 season.	• None due to closure.
Unalaska Bay Tanner Crab	Commercial fishing in state waters in Unalaska Bay	• Floating oil has been encountered in fishery area (Unalaska) Bay and tar balls and tar patties observed on area beaches. • Crab are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Potential for floating oil in Unalaska Bay to enter seawater intakes on vessels that use refrigerated or re-circulating tanks. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Bering Sea Snow Crab	Commercial fishery in Bering Sea, at some distance from Unalaska. Catcher vessels deliver to shore-based and floating processors in Unalaska Bay and Akutan.	• Fleet utilizes re-circulating seawater tanks that constantly pump water to keep crab alive. Floating oil may enter vessel seawater system and contaminate catch. • Because of the way the fishery is structured, vessels must wait up to a week for an opportunity to deliver catch to Unalaska Bay processors. Vessels wait at anchor in the bay and continually pump seawater, lengthening their time of potential exposure. • Crab are vulnerable to oil through ingestion,

Fishery	Proximity to Spill Impact Area	Potential Vulnerabilities
		direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Golden King Crab	Commercial fishery in Bering Sea, at some distance from Unalaska. Catcher vessels deliver to shore-based and floating processors in Unalaska Bay and Akutan.	• Fishery closed in early January and catch levels low during the time of the oil spill. • Crab are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Potential for floating oil to enter seawater intakes on vessels. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.
Salmon	No commercial fishery in 2005.	• Not applicable.
Herring	Occurs in Unalaska Bay	• Fishery includes areas where floating oil has been encountered and areas adjacent to known oiled beaches. • Fish are vulnerable to oil through ingestion, direct contact, and absorption of dissolved phase oil. • Fishing gear vulnerable to contamination. • Potential for floating oil in Unalaska Bay to enter water intake at processing plants.

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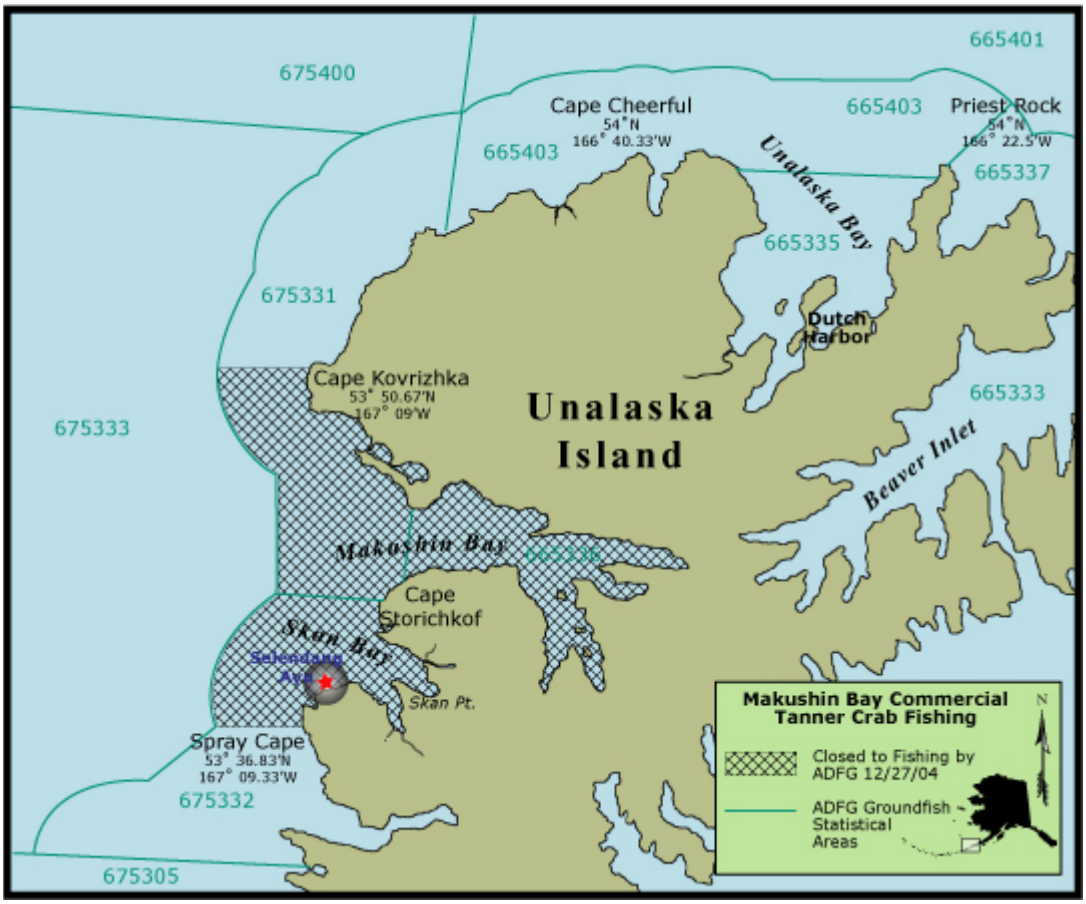
Appendix A: Fishery Fact Sheets

- Makushin Tanner Crab Fishery
- Unalaska Tanner Crab Fishery
- Bering Sea Snow Crab Fishery
- Bering Sea/Aleutian Islands Pacific Cod Fishery – Pot Gear
- Bering Sea/Aleutian Islands Pollock Fishery "A" Season
- Bering Sea/Aleutian Islands Pacific Cod Fishery – Trawl Gear

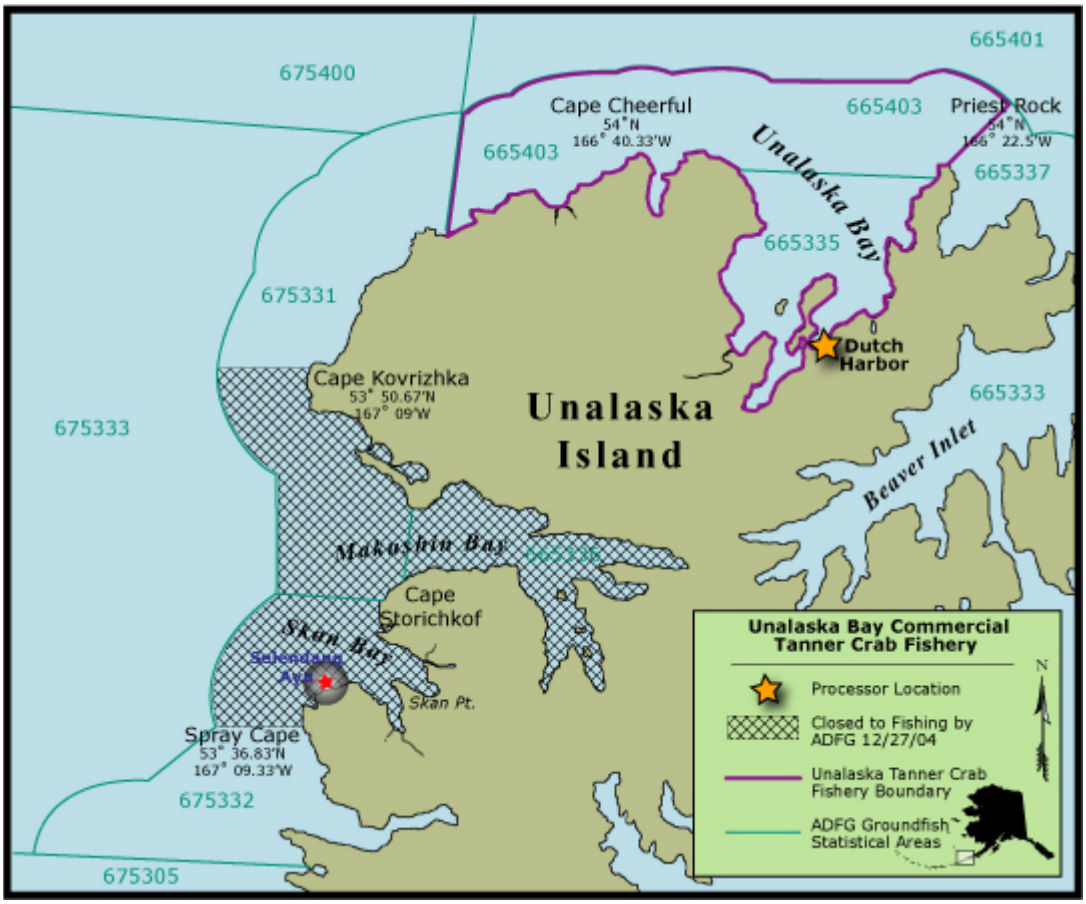
Makushin Tanner Crab Fishery



Fish Species	Tanner Crab {Chionoecetes bairdi}	*Location of Fishery*	Makushin ADFG statistical areas 675332, 675331, 665336
Harvest Level	Quota 171,453 lbs	*Number of Vessels*	55 (final)
Registration Deadline	12/27/04	*Sea water Circulation*	Yes – sea water is continuously circulated through live tanks
Open Date	January 15, 2005 - Noon	*Management Agency*	Alaska Department of Fish and Game (ADFG)
Close date	At quota, no later than 3/31/05	*Gear Type*	Crab Pots
Processors	Shore-based only - Dutch Harbor/Unalaska	*Transit Route*	Nearshore transit northeast around Unalaska Island to Unalaska Bay
2005 Fishery Status	Closed until further notice – 12/27/04		

For more information contact ADFG Commercial Fisheries Area Management Biologist, Forrest Bowers (907) 581-1239,or visit
http://www.state.ak.us/dec/spar/perp/response/sum_fy05/041207201/041207201_closure.pdf

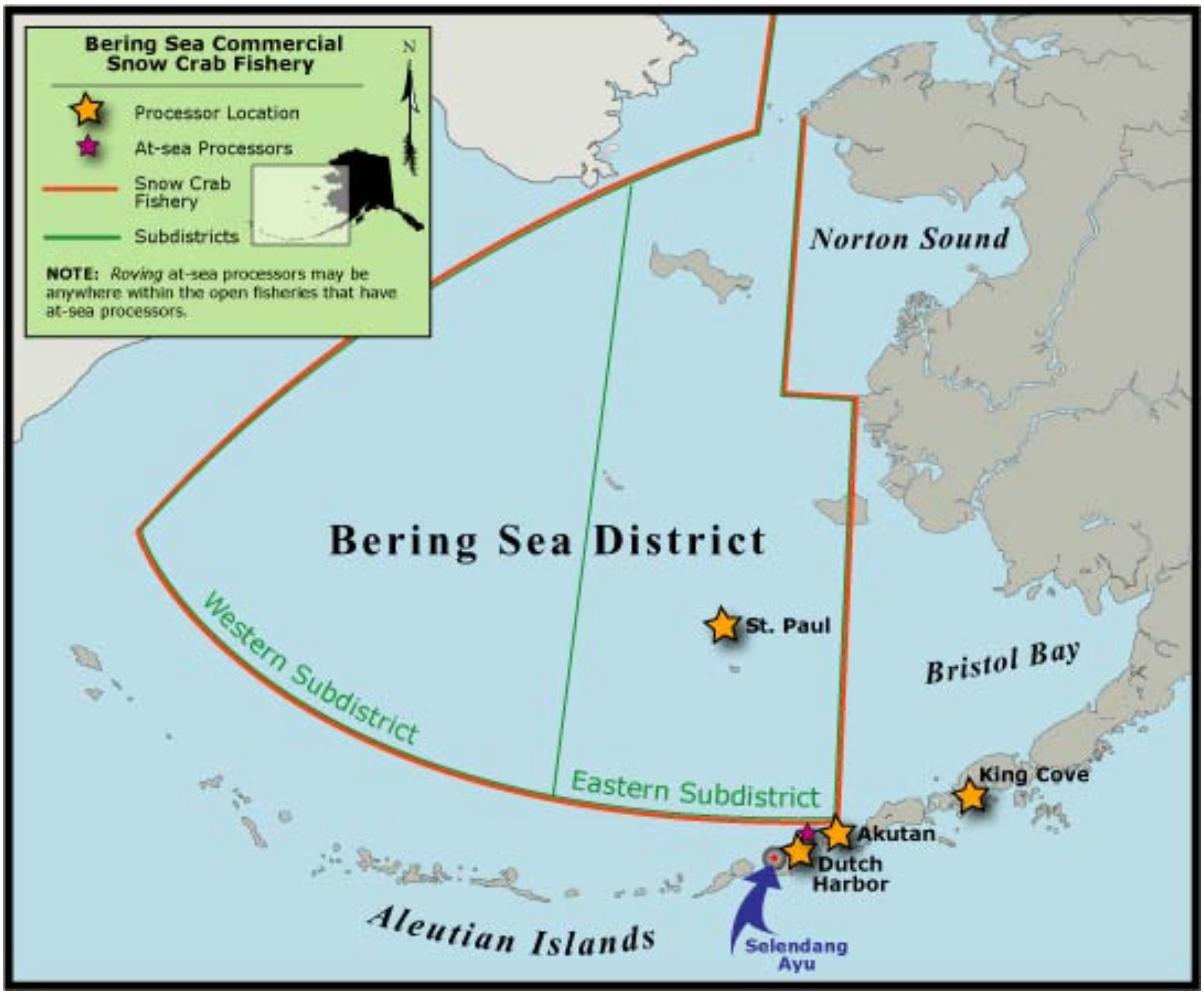
Unalaska Tanner Crab Fishery



Fish Species	Tanner Crab {Chionoecetes bairdi}	*Location of Fishery*	Unalaska Bay – ADFG statistical area 665335, 665403.
Harvest Level	Quota 35,304 lbs	*Number of Vessels*	55 (includes Makushin area Tanner Crab fishery)
Registration Deadline	12/27/04	*Sea water Circulation*	Live hold tanks in most vessels. A few use dry holds because of proximity to processors.
Open Date	January 15, 2005 - Noon	*Management Agency*	Alaska Department of Fish and Game (ADFG)
Close date	Quota was reached 1/18/05	*Gear Type*	Crab pots
Processors	Shore-based only - Dutch Harbor/Unalaska	*Transit Route*	All of Unalaska Bay may be transited.
Other	Vessel size limited 58 feet (from Cape Cheerful to Priest Rock).	*2005 Fishery Status*	Unaffected by Selendang Ayu fishery closures

For more information contact ADFG Commercial Fisheries Area Management Biologist, Forrest Bowers (907) 581-1239or visit http://www.cf.adfg.state.ak.us/region4/news/2004/nr1104a04.pdf

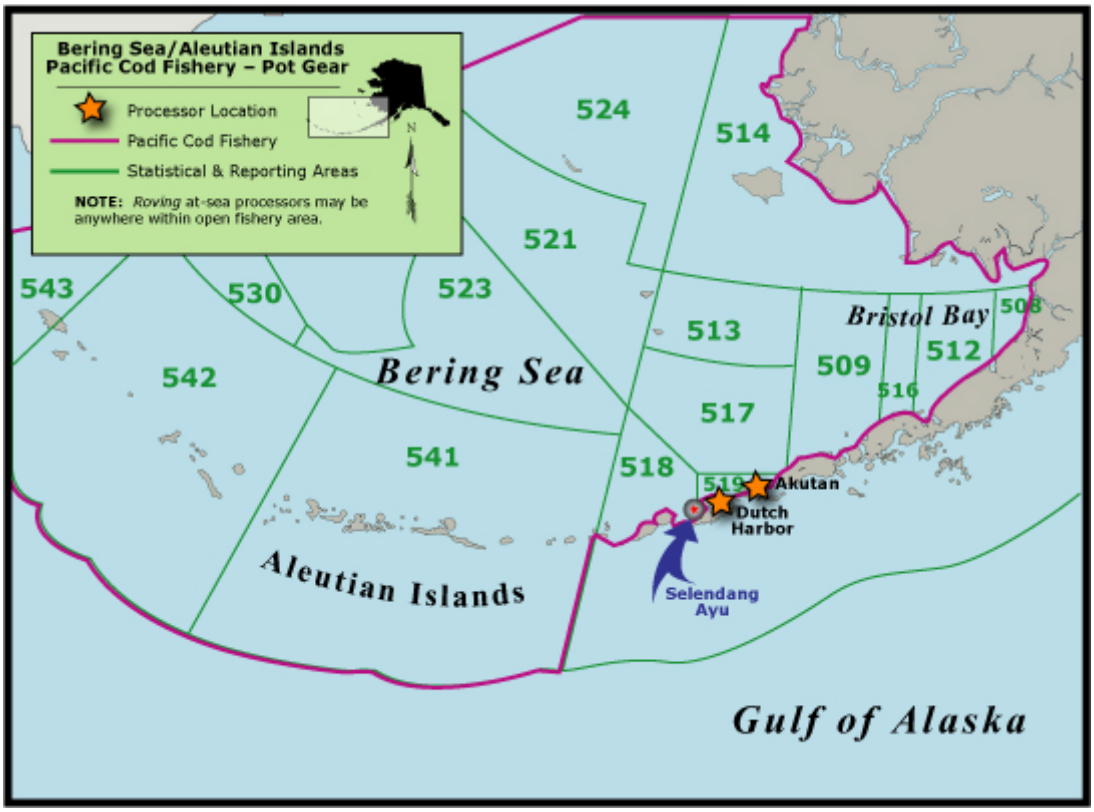
Bering Sea Snow Crab Fishery



Fish Species	*Chionoecetes opilio*	*Location of Fishery*	Bering Sea District west of 166° W longitude
Harvest Level	20.9 million pounds	*Number of Vessels*	171
Registration	12/27/04	*Sea water Circulation*	Yes, live hold
Open Date	1/15/05	*Management Agency*	ADFG
Close date	1/20/05 (quota met)	*Gear Type*	Crab pots
Shore-Based Processors	Unalaska, Akutan, King Cove, Kodiak & St. Paul	*At-sea Processors*	Catcher-processors and at-sea processors; some anchor in Unalaska bay.
2005 Fishery Status	Unaffected by Selendang Ayu closures. Processing completed in Unalaska 2/6/05.		

For more information contact ADFG Commercial Fisheries Area Management Biologist, Forrest Bowers (907) 581-1239 or visit http://www.cf.adfg.state.ak.us/region4/news/2004/nr091604.pdf.

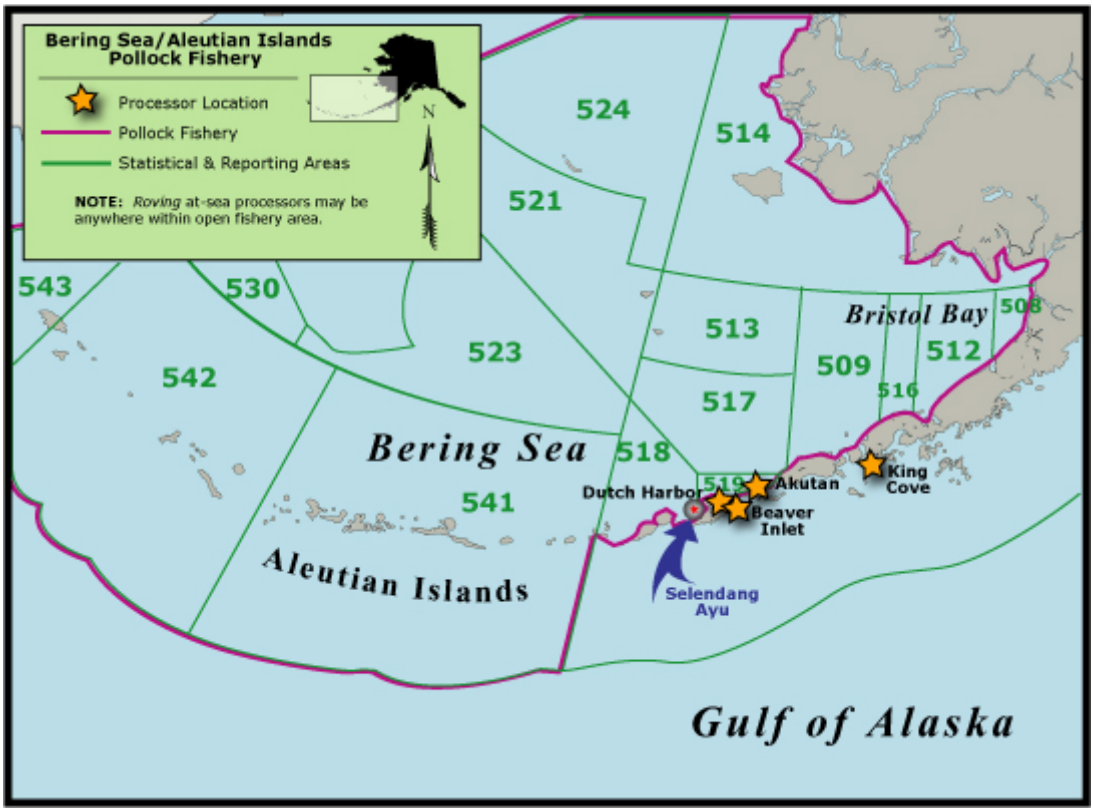
Bering Sea/Aleutians Pacific Cod Fishery – Pot Gear



Fish Species	*Gadus macrocephalus*	*Location of Fishery*	Bering Sea/Aleutian Islands, including Bogoslof exemption area
Harvest Level	2005 TAC is 206,000 mt (quota is shared with trawl fleet)	*Number of Vessels*	35-50
Registration	Federal permit required http://www.fakr.noaa.gov/ram/ffpfpp.htm	*Sea water Circulation*	RSW. Some boats use ice in hold instead of seawater.
Open Date	1/1/05 but fishing doesn't usually start in earnest until close of snow crab	*Management Agency*	NMFS
Close date	Closed in phases from 2/12/05 – 3/10/05 based on gear/vessel specifications	*Gear Type*	Pot, hook & line, trawl
Processors	Dutch Harbor, Akutan and at-sea	*Transit Route*	Dutch Harbor east to fishing grounds.
2005 Fishery Status	Closures to inshore waters - Skan & Makushin Bays by ADFG 12/27/04		

For more information contact NMFS Alaska Groundfish Management - Andy Smoker, (907) 586-7210 or Rance Morrison (907) 581-2062, or visit http://www.fakr.noaa.gov/sustainablefisheries/default.htm.

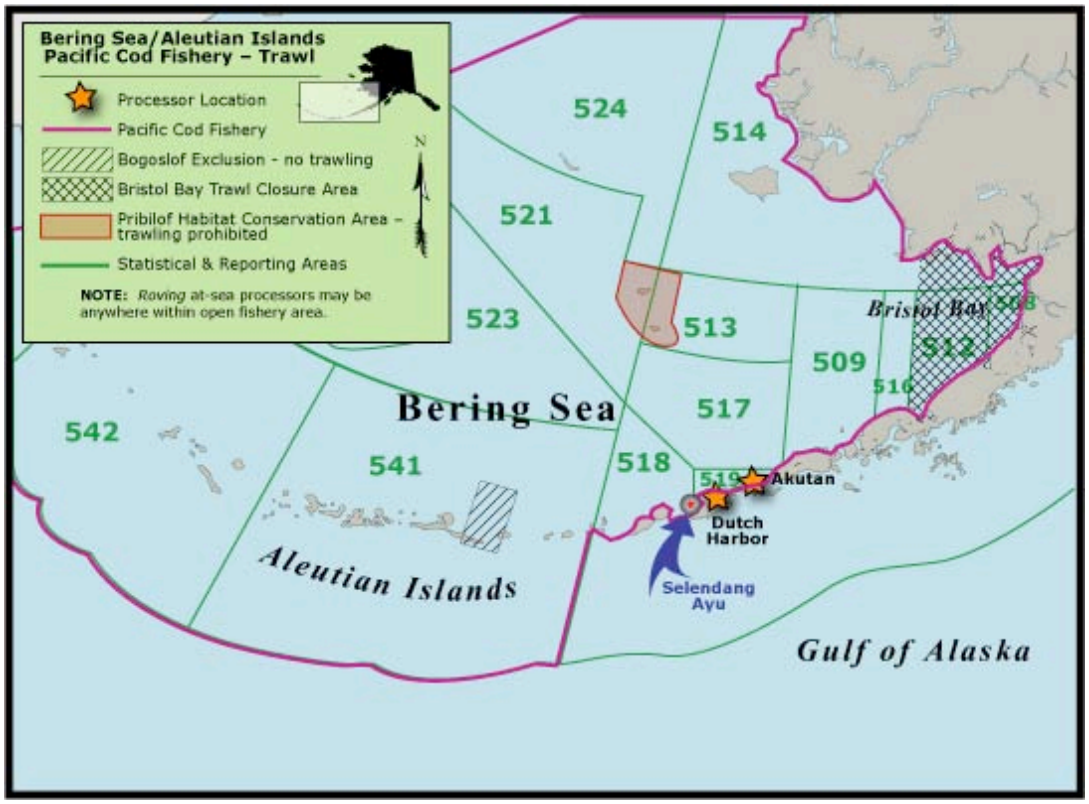
Bering Sea/Aleutian Islands Pollock Fishery "A Season"



Fish Species	*Theragra chalcogramma*	*Location of Fishery*	EBS & AI. Fishing is concentrated north & west of Unimak Island
Harvest Level	EBS -1,478,500 mt AI – 19,000 mt Bogoslof – 10 mt Quota split between A & B seasons	*Number of Vessels*	Approx. 60 catcher vessels, 20 factory vessels & 3 mother ships; quota is divided 50% catcher, 40% catcher/processor & 10% mothership
Registration	Federal permit required http://www.fakr.noaa.gov/ram/ffpfpp.htm	*Sea water Circulation*	Refrigerated Sea Water (RSW), no live hold
Open Date	1/20/05	*Management Agency*	NMFS
Close date	3/25/05	*Gear Type*	Trawl
Shore-based Processors	Dutch Harbor, King Cove, Akutan, Beaver Inlet; shore-based fleet comes ashore every 2 days or so	*At-sea or catcher-processors*	Catcher-processors, floating processors & mother ships
Other	Sea Lion conservation areas (SCA) affect catch limits in some areas.	*2005 Fishery Status*	Closures to inshore waters - Skan & Makushin Bays by ADFG 12/27/04

For more information contact NMFS Alaska Groundfish Management - Andy Smoker, (907) 586-7210 or Rance Morrison (907) 581-2062, or visit http://www.fakr.noaa.gov/sustainablefisheries/default.htm.

Bering Sea/Aleutian Islands Pacific Cod Fishery - Trawl



Fish Species	*Gadus macrocephalus*	***Location of Fishery***	Bering Sea/Aleutian Islands – fishery concentrated east of Unalaska
Harvest Level	2005 TAC is 206,000 mt (quota is shared with pot/line fishery)	***Number of Vessels***	10-20
Registration	Federal permit required http://www.fakr.noaa.gov/ram/ffpfpp.htm	***Sea water Circulation***	RSW
Open Date	A Season - 1/20/05 B Season – 9/1/2005	***Management Agency***	NMFS
Close date	A Season closed 3/13, then re-opened 3/29 with 2,400 mt remaining in quota for first seasonal allowance	***Gear Type***	trawl
Processors	Primarily at-sea, catcher-processors	***2005 Fishery Status***	Closures to inshore waters - Skan & Makushin Bays by ADFG 12/27/04

For more information contact NMFS Alaska Groundfish Management - Andy Smoker, (907) 586-7210 or Rance Morrison (907) 581-2062, or visit http://www.fakr.noaa.gov/sustainablefisheries/default.htm.

Appendix B: Acronyms

ADFG	Alaska Department of Fish and Game
AI	Aleutian Islands
BS/AI	Bering Sea/Aleutian Islands
CDQ	Community Development Quota
DCCED	Department of Commerce, Community and Economic Development
DEC	Department of Environmental Conservation
EBS	Eastern Bering Sea
GHL	Guideline Harvest Level
GOA	Gulf of Alaska
H&L	Hook and line
IFQ	Individual Fishing Quota
IPHC	International Pacific Halibut Commission
NTP	Notice to Proceed (for DEC Term Contractors)
Mt	Metric Ton
M/V	Motor Vessel
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
RSW	Refrigerated Seawater
SCA	Sea lion Conservation Area
SWAMC	Southwest Alaska Municipal Conference
TAC	Total Allowable Catch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