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**Incidental Catches of Salmonids by U.S. Groundfish  
Fisheries in the Bering Sea/Aleutian Islands and  
the Gulf Of Alaska, 1990-2011**

by

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**INCIDENTAL CATCHES OF SALMONIDS  
BY U.S. GROUND FISH FISHERIES  
IN THE BERING SEA/ALEUTIAN ISLANDS  
AND THE GULF OF ALASKA, 1990-2011**

**ABSTRACT**

This report presents the estimated incidental catches of Pacific salmonids in U.S. groundfish fisheries off Alaska for 1977 through September 15, 2011. Estimated annual incidental salmon catches (all species combined) through September 15, 2011, were 87,550 salmon in the Bering Sea/Aleutian Islands (BSAI) and 12,271 salmon in the Gulf of Alaska (GOA).

In the U.S. groundfish fisheries in the BSAI, annual estimated numbers of Chinook salmon (*Onchorhynchus tshawytscha*) have ranged from 8,223 (year 2000) to 129,5567 (year 2007) and the annual average weight has ranged from 2.82 kg in 2007 to 5.21 kg in 1995. Annual estimated numbers of non-Chinook salmon have ranged from 14,965 in 2010 to 709,391 in 2005. Chum salmon (*Onchorhynchus keta*) typically account for over 95% of the non-Chinook salmon catch. The annual average chum salmon weight has ranged from 2.07 kg in 1993 to 3.43 kg in 1995.

In the U.S. groundfish fisheries in the Gulf of Alaska, annual estimated numbers of Chinook salmon have ranged from 8,430 in 2009 to 54,631 in 2010 and the annual average weight has ranged from 2.28 kg in 2010 to 4.60 kg in 1991. Annual estimated numbers of non-Chinook salmon have ranged from 1,860 in 2010 to 64,792 in 1995. Chum salmon typically account for over 95% of the non-Chinook salmon catch. The annual average chum salmon weight has ranged from 2.16 kg in 1993 to 4.87 kg in 1999.

Incidental catches of Pacific salmonids in foreign and joint venture groundfish fisheries off Alaska are presented for 1977-1990. The last joint venture operations took place in 1990 in the Bering Sea/Aleutian Islands, with an incidental catch of 152 salmon.

**INTRODUCTION**

Groundfish fisheries in Alaskan waters are conducted primarily by the use of trawl gear that occasionally encounters and catches Pacific salmonids. Other gear used to harvest groundfish - longline and pots - generally do not catch many salmonids. The incidental catches of salmonids are monitored by the U.S. National Marine Fisheries Service (NMFS). Estimates are produced by the NMFS Alaska Regional Office by applying the bycatch rates calculated from observer data to the total groundfish catches. Total groundfish catch estimates are derived from multiple sources including landing reports, observer reports, and production reports.

The observer program coverage for the groundfish trawl fisheries off Alaska has historically been 100% for the large-sized vessel fleet (greater than 125 ft. length overall) and 30% for the medium-sized vessel fleet (60-125 ft. length overall). The small-sized vessel fleet (less than 60 ft. length overall) is not monitored by direct observer coverage. Instead, some of their catches are sampled when they deliver to motherships or shore-based processing plants. Motherships are staffed 100% of the time by observers

and shore-based plants are staffed 30% or 100%, depending upon the volume of fish processed.

In 2010 NMFS issued regulations to implement Amendment 91 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area starting in January 2011. The text of Amendment 91 can be found at <http://www.fakr.noaa.gov/sustainablefisheries/bycatch/salmon/chinook/amd91.pdf>.

These regulations are intended to minimize the Chinook salmon (*Onchorhynchus tshawytscha*) bycatch in the Bering Sea (BS) pollock fishery while maintaining potential for full harvest of the catch by establishing a cap on Chinook salmon bycatch in the fishery. These regulations also increased observer coverage requirements to ensure that all catches of BS pollock are monitored and required a substantial change in the observer sampling protocol for salmon to support the estimation of Chinook salmon bycatch and the collection of samples for genetic stock of origin analyses.

All salmon, as well as king and tanner crab and halibut, are classified as prohibited species in the groundfish fishery off Alaska and catch of these species must be avoided. Prior to January 2011, regulations required that any prohibited species caught must be returned to the sea as soon as is practicable after an observer had collected any required data from the species. With the implementation of Amendment 91, bycatch of all salmon species in the BS pollock fishery must be retained. Further, the operator of a vessel and the manager of a shoreside processor or stationary floating processor (SFP) must not discard any salmon or transfer or process any salmon under the Prohibited Species Donation Program until the total number of salmon by species has been determined by the observer and the observer's collection of any scientific data or biological samples from the salmon has been completed.

In July 2011 the North Pacific Fisheries Management Council (Council) determined that Chinook salmon prohibited species catch (PSC) taken incidentally in Gulf of Alaska (GOA) pollock fisheries was also a concern, historically accounting for the greatest proportion of Chinook salmon taken in GOA groundfish fisheries. As a result the Council adopted a GOA Chinook salmon PSC limit and increased monitoring. NMFS is developing rules implementing this action. Once implemented, the chosen PSC limit of 25,000 Chinook salmon was apportioned between the Central and Western GOA (Central GOA: 18,316; Western GOA: 6,684). This action will also require full retention of all salmon in pollock trawl fisheries and provides direction for NFMS to work with the processors to evaluate and address the quality of sorting at the plants to assist improvements in observer salmon estimates. The full **GOA Chinook salmon PSC motion adopted by te Council can be found at:** <http://www.fakr.noaa.gov/npfmc/PDFdocuments/bycatch/GOAChinookBycatchMotion611.pdf>

This report presents the incidental catches of Pacific salmonids in U.S. groundfish fisheries in the BSAI and GOA for 1977 through September 15, 2011.

## RESULTS

Table 1 provides a summary of the groundfish and salmonid catches reported by NMFS, 1990-September 15, 2011. Through 2010, the U.S. groundfish catch in the Bering Sea/Aleutian Islands (BSAI) has ranged from 1,335,434 mt in 2009 to 2,154,903 mt in 1991. Through September 15, 2011 the U.S. groundfish catch in the BSAI is 1,510,142 mt. From 1990 – 2010, the incidental catch of

Chinook salmon has ranged from 8,223 in 2000 to 129,567 in 2007; while the incidental catch of non-Chinook salmon has ranged from 14,965 in 2010 to 709,391 in 2005. Through September 15, 2011 the incidental catch of Chinook salmon is 8,856. The incidental catch of non-Chinook salmon 78,694.

Through 2010, the U.S. groundfish catch in the Gulf of Alaska (GOA) has ranged from 164,459 mt in 2007 to 269,797 mt in 1992. Through September 15, 2011 the U.S. groundfish catch in the GOA is 169,794 mt. From 1990 – 2010, the incidental catch of Chinook salmon has ranged from 8,430 in 2009 to 54,631 in 2010; while the incidental catch of non-Chinook salmon has ranged from 1,860 in 2010 to 64,792 in 1995. Through September 15, 2011 the incidental catch of Chinook salmon is 10,513 and the incidental catch of non-Chinook salmon is 1,758.

The last year of joint venture operations occurred in the BSAI, with a groundfish catch of 133,438 mt and an incidental catch of 147 Chinook salmon, 2 Chum salmon, and 3 Coho salmon.

The annual average weight of Chinook salmon in the BSAI through September 15, 2011 is 3.07 kg compared to the 1990-2010 annual average weight range of 2.82 kg in 2007 to 5.21 kg in 1995 (Table 2). The annual average weight of Chinook salmon in the GOA through September 15, 2011 is 2.27 kg. The 1990-2010 annual average weights of GOA Chinook salmon range from 2.28 kg in 2010 to 4.60 kg in 1991.

The annual average weights of chum salmon in the BSAI range from 2.07 kg in 1993 to 3.43 kg in 1995 (Table 3). Through September 15, 2011, the chum average weight is 2.77 kg. The annual average weights of chum salmon in the GOA range from 2.16 kg in 1993 to 4.87 kg in 1999 while the 2011 the chum average weight through September 15 is 3.15 kg

Table 4 provides the estimated incidental catches of Pacific salmonids in the foreign and joint venture groundfish fisheries off Alaska for 1977-1989

Table 1. Total groundfish catch and estimated bycatch of Chinook and other Pacific salmon in U.S. groundfish fisheries, 1990-2011\*.

Year	Region	Groundfish Catch (mt)	Chinook	Chum	Coho	Sockeye	Pink	Total
			-----estimated numbers of fish-----					
Domestic								
1990	BSAI	1,706,379	14,085	16,202	153	30	31	30,501
1991	BSAI**	2,154,903	48,880	28,270	656	1,310	26	79,142
1992	BSAI	2,057,849	41,955	40,090	1,266	14	80	83,405
1993	BSAI**	1,854,216	46,014	242,916	324	22	8	289,284
1994	BSAI	1,958,788	43,821	94,107	228	20	193	138,369
1995	BSAI	1,928,073	23,436	20,983	871	0	21	45,311
1996	BSAI	1,847,631	63,205	77,819	234	5	2	141,265
1997	BSAI	1,824,188	50,530	66,816	109	3	66	117,524
1998	BSAI	1,615,685	55,431	-----	-----	65,697	-----	121,128
1999	BSAI	1,424,752	14,599	-----	-----	47,132	-----	61,731
2000	BSAI	1,607,549	8,223	-----	-----	59,327	-----	67,550
2001	BSAI	1,813,924	40,547	-----	-----	60,731	-----	101,278
2002	BSAI	1,934,957	39,684	-----	-----	82,483	-----	122,167
2003	BSAI	1,970,817	53,571	-----	-----	197,142	-----	250,713
2004	BSAI	1,979,143	60,442	-----	-----	450,588	-----	511,030
2005	BSAI	1,981,374	74,281	-----	-----	709,391	-----	783,672
2006	BSAI	1,976,553	87,084	-----	-----	325,185	-----	412,269
2007	BSAI	1,856,733	129,567	-----	-----	97,353	-----	226,920
2008	BSAI	1,540,610	24,167	-----	-----	16,898	-----	41,065
2009	BSAI	1,335,434	14,008	-----	-----	47,555	-----	61,563
2010	BSAI	1,351,699	12,532	-----	-----	14,965	-----	27,497
2011	BSAI	1,510,142	8,856	-----	-----	78,694	-----	87,550

Table 1. (Continued)

Year	Region	Groundfish Catch (mt)	Chinook -----	Chum -----	Coho -----	Sockeye -----	Pink -----	Total
			-----estimated numbers of fish-----					
Domestic								
1990	GOA	244,397	16,913	2,541	1,482	85	64	21,085
1991	GOA	269,616	38,894	13,711	1,133	46	64	53,848
1992	GOA	269,797	16,794	11,140	55	21	0	28,010
1993	GOA	255,434	24,465	55,268	306	15	799	80,853
1994	GOA	239,503	13,613	36,782	42	96	306	50,839
1995	GOA	216,585	14,647	64,067	668	41	16	79,439
1996	GOA	202,054	15,761	3,969	194	2	11	19,937
1997	GOA	230,448	15,119	3,349	41	7	23	18,539
1998	GOA	245,516	16,984	-----	13,544	-----	-----	30,528
1999	GOA	227,614	30,600	-----	7,529	-----	-----	38,129
2000	GOA	204,398	26,705	-----	10,995	-----	-----	37,700
2001	GOA	182,011	15,104	-----	6,063	-----	-----	21,167
2002	GOA	165,664	12,920	-----	3,219	-----	-----	16,139
2003	GOA	177,315	15,396	-----	9,530	-----	-----	24,926
2004	GOA	172,438	17,777	-----	5,809	-----	-----	23,586
2005	GOA	185,915	31,270	-----	6,608	-----	-----	37,878
2006	GOA	196,847	19,004	-----	4,226	-----	-----	23,230
2007	GOA	164,459	40,532	-----	3,421	-----	-----	43,953
2008	GOA	184,751	16,139	-----	2,156	-----	-----	18,295
2009	GOA	166,357	8,430	-----	2,355	-----	-----	10,785
2010	GOA	216,441	54,631	-----	1,860	-----	-----	56,491
2011	GOA	169,794	10,513	-----	1,758	-----	-----	12,271

Table 1. (Continued)

Year	Region	Groundfish Catch (mt)	Chinook -----	Chum -----	Coho -----	Sockeye -----	Pink -----	Total
		-----estimated numbers of fish-----						
Joint Venture								
1990	BSAI	133,438	147	2	3	0	0	152
1990	GOA	0	0	0	0	0	0	0

BSAI = Bering Sea/Aleutian Islands; GOA = Gulf of Alaska

\* Through 9/15/2011

\*\* 1 steelhead was reported in 1991 and 5 steelhead were reported in 1993.

Note: For 1998 - 2011, the estimates of non-chinook salmon are not separated by species and are thus listed as a single value.

Groundfish catch and salmonid numbers in the BSAI include catches made by vessels fishing under Community Development Quotas.

Table 2. Average body weight of chinook salmon incidentally caught in U.S. groundfish fisheries, 1990-2011\*.

Year	Region	Male Avg. Wt. (kg)	Female Avg. Wt. (kg)	Unsexed Avg. Wt. (kg)	Combined Avg. Wt. (kg)
1990	BSAI	3.73	3.71	3.56	3.70
1991	BSAI	2.82	3.47	3.03	3.10
1992	BSAI	3.03	3.65	4.23	3.54
1993	BSAI	3.78	4.11	4.74	4.01
1994	BSAI	4.37	4.29	4.11	4.30
1995	BSAI	4.95	5.43	5.19	5.21
1996	BSAI	3.67	3.89	3.39	3.75
1997	BSAI	4.02	4.17	4.41	4.14
1998	BSAI	2.91	3.30	2.40	3.02
1999	BSAI	3.53	3.73	3.91	3.64
2000	BSAI	3.67	3.87	4.12	3.78
2001	BSAI	2.94	3.32	1.50	3.04
2002	BSAI	3.79	4.15	3.07	3.89
2003**	BSAI	--	--	--	3.44
2004**	BSAI	--	--	--	3.50
2005**	BSAI	--	--	--	3.29
2006**	BSAI	--	--	--	3.01
2007	BSAI	2.81	2.95	2.40	2.82
2008	BSAI	3.51	3.67	4.10	3.62
2009	BSAI	3.69	3.96	3.99	3.84
2010	BSAI	4.08	4.08	3.40	4.07
2011	BSAI	2.73	4.01	2.15	3.07



Table 2. (Continued)

Year	Region	Male Avg. Wt. (kg)	Female Avg. Wt. (kg)	Unsexed Avg. Wt. (kg)	Combined Avg. Wt. (kg)
1990	GOA	3.94	4.29	3.91	4.10
1991	GOA	3.06	5.10	4.08	4.60
1992	GOA	4.46	4.11	3.58	4.14
1993	GOA	2.83	2.76	3.40	2.90
1994	GOA	3.72	3.69	2.85	3.63
1995	GOA	4.48	3.31	3.00	3.67
1996	GOA	2.71	2.97	2.80	2.83
1997	GOA	4.28	4.08	5.08	4.49
1998	GOA	3.00	3.07	3.47	3.08
1999	GOA	2.69	3.16	2.49	2.82
2000	GOA	3.34	3.21	3.45	3.32
2001	GOA	3.36	3.08	2.95	3.20
2002	GOA	2.76	2.59	3.38	2.73
2003**	GOA	--	--	--	2.84
2004**	GOA	--	--	--	2.47
2005**	GOA	--	--	--	2.46
2006**	GOA	--	--	--	3.41
2007	GOA	2.84	3.35	2.75	2.99
2008	GOA	2.95	2.74	2.47	2.79
2009	GOA	2.68	2.94	4.34	2.97
2010	GOA	2.19	2.36	2.25	2.28
2011	GOA	2.41	2.32	2.10	2.27

BSAI = Bering Sea/Aleutian Islands; GOA = Gulf of Alaska

\* Data presented for 2011 are based on preliminary data.

\*\* For years 2003 - 2006, only the combined average weight is shown because observers were combining sexes prior to weighing the salmon.

Table 3. Average body weight of chum salmon incidentally caught in U.S. groundfish fisheries, 1990-2011\*.

Year	Region	Male Avg. Wt. (kg)	Female Avg. Wt. (kg)	Unsexed Avg. Wt. (kg)	Combined Avg. Wt. (kg)
1990	BSAI	2.27	2.26	2.45	2.32
1991	BSAI	2.76	2.40	2.91	2.66
1992	BSAI	2.54	2.48	2.61	2.56
1993	BSAI	2.16	1.96	2.07	2.07
1994	BSAI	2.72	2.65	2.62	2.66
1995	BSAI	3.46	3.17	3.83	3.43
1996	BSAI	2.47	2.23	2.10	2.31
1997	BSAI	2.35	2.24	1.98	2.25
1998	BSAI	2.88	2.50	3.02	2.86
1999	BSAI	2.97	2.82	3.10	2.96
2000	BSAI	2.97	2.79	2.64	2.77
2001	BSAI	2.70	2.47	2.56	2.61
2002	BSAI	2.97	2.71	3.04	2.91
2003**	BSAI	--	--	--	2.52
2004**	BSAI	--	--	--	2.41
2005**	BSAI	--	--	--	2.15
2006**	BSAI	--	--	--	2.77
2007	BSAI	2.40	2.19	2.12	2.26
2008	BSAI	3.03	2.87	2.61	2.94
2009	BSAI	2.61	2.36	2.25	2.44
2010	BSAI	2.75	2.57	2.22	2.67
2011	BSAI	2.85	2.73	2.52	2.77

Table 3. (Continued)

Year	Region	Male Avg. Wt. (kg)	Female Avg. Wt. (kg)	Unsexed Avg. Wt. (kg)	Combined Avg. Wt. (kg)
1990	GOA	3.22	3.16	2.94	3.12
1991	GOA	3.27	2.90	3.11	3.11
1992	GOA	3.09	3.02	2.44	2.88
1993	GOA	2.40	2.27	1.93	2.16
1994	GOA	3.40	3.20	2.92	3.10
1995	GOA	3.14	3.12	2.97	3.02
1996	GOA	3.10	2.42	2.50	2.61
1997	GOA	5.28	4.09	3.94	4.37
1998	GOA	3.84	3.77	3.75	3.80
1999	GOA	4.33	5.45	3.84	4.87
2000	GOA	4.16	4.26	4.17	4.20
2001	GOA	2.83	2.90	3.16	2.91
2002	GOA	3.61	3.53	3.39	3.51
2003**	GOA	--	--	--	3.18
2004**	GOA	--	--	--	3.68
2005**	GOA	--	--	--	4.61
2006**	GOA	--	--	--	3.77
2007	GOA	3.26	2.99	3.01	3.10
2008	GOA	3.65	2.78	1.26	2.67
2009	GOA	3.20	3.65	3.26	3.34
2010	GOA	3.05	3.96	2.43	3.31
2011	GOA	3.30	3.01	3.64	3.15

BSAI = Bering Sea/Aleutian Islands; GOA = Gulf of Alaska

\* Data presented for 2011 are based on preliminary data.

\*\* For years 2003 - 2006, only the combined average weight is shown because observers were combining sexes prior to weighing the salmon.

Table 4. Estimated incidental catches of Pacific salmonids previously reported to the International North Pacific Fisheries Commission, 1977-1989.

Year	Bering Sea/ Aleutian*	Gulf of Alaska**
1977	47,840	5,222
1978	44,548	45,603
1979	107,706	21,460
1980	122,002	36,069
1981	43,191	30,860
1982	23,623	6,967
1983	42,666	13,874
1984	84,138	75,846
1985	20,423	14,102
1986	20,983	20,820
1987	14,234	1,221
1988	9,380	147
1989	14,153	0

\* Reported in INPFC Doc. 3588, October 1990

\*\* Reported in INPFC Doc. 3417, September 1989