AGENDA C-4(b)
JUNE 2009

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

DATE: December 3, 2009

SUBJECT: Bering Sea Salmon Bycatch

ESTIMATED TIME
6 HOURS
All C-4 items

ACTION REQUIRED

(b) Discussion paper on Bering Sea chum bycatch; Salmon Bycatch Workgroup committee report; review and revise alternatives for analysis

BACKGROUND

In October 2009 Council reviewed a discussion paper outlining background data and information on chum (non-Chinook) salmon bycatch in the EBS pollock fishery and the draft suite of alternatives for analysis of bycatch management measures for chum salmon in this fishery. The Council previously (June 2009) received a scoping report from NMFS on comments received during the public scoping period for the forthcoming analysis of chum salmon bycatch measures.

The Council revised its current suite of alternatives and requested that staff extensively expand upon the discussion paper to update all data as available as well as include calculations of relative cap levels and sector-specific bycatch as noted and discuss implications of the revised suite of alternatives, particularly as it relates to the Council's final action on Chinook bycatch management. This revised discussion paper (including the Council's October 2009 motion) is attached as Item C-4(b)(1). At the Council's request, the Salmon Bycatch Workgroup convened a meeting on October 29th to review and discuss the paper and the current suite of alternatives. The workgroup report is attached as Item C-4(b)(2). Information that was presented at the workgroup meeting regarding chum stock status and status of genetic work on determining stock of origin are attached as Item C-4(b)(3) and Item C-4(b)(4) respectively. Additional information on Area M catch and stock status per committee request is attached as Item C-4(b)(5).

At this meeting the Council will review the discussion paper, the committee report, receive a presentation from ADF&G staff on chum stock status, review and refine alternatives for analysis and establish a timeline for the analysis. Information related to scheduling for this analysis as well as proposed timelines depending upon Council discussion is contained in Item C-4(b)(6). Further information on the schedule for chum salmon genetic information is contained in the NMFS letter to Chairman Olsen under B-2 in your notebooks.

CHUM SALMON BYCATCH DISCUSSION PAPER

DECEMBER 2009

This paper summarizes current trends in chum salmon bycatch as well as the current suite of alternatives under consideration by the Council in a forthcoming chum salmon bycatch management measures analysis. The Council last reviewed the alternatives in June 2009. The June 2009 Council motion is attached as appendix 1.

At their upcoming December 2009 meeting, the Council will review the current suite of alternatives for Chum (Non-Chinook) salmon bycatch in the EBS pollock fishery as amended in June 2009. The Council may modify the alternatives at this time and discuss an appropriate timeline for this analysis. Information contained in this paper summarizes the current bycatch trends by season and sector through 2009, the current suite of alternatives as revised in June 2009, possible interactions between any proposed measures for chum salmon bycatch management and those to be implemented under the Amendment 91 bycatch management program for Chinook salmon as well as considerations for the subsequent analysis with respect to staff timing and availability.

TRENDS IN NON-CHINOOK (CHUM) BYCATCH

For catch accounting and PSC limits 4 species of salmon (Sockeye, Coho, Pink and Chum) are aggregated into an 'other salmon' or non-Chinook salmon species category. Chum salmon comprises over 99.6% of the total catch in this category (Table 1).

The majority of non-Chinook bycatch in the Bering Sea occurs in the pollock fishery. Historically, the contribution of non-Chinook bycatch from the pollock trawl fishery has ranged from a low of 88% of all bycatch to a high of >99.5% in 1993. Since 2002 bycatch of non-Chinook salmon in the pollock fishery has comprised over 95% of the total. Total catch of non-Chinook salmon in the pollock fishery reached an historic high in 2005 at 705,963 fish (Table 2; Figure 1). Bycatch of non-Chinook salmon in this fishery occurs almost exclusively in the B season.

Bycatch rates for chum salmon (chum salmon/mt of pollock) from 1991-2007 are shown in Figure 2. Currently the Chum Salmon Savings Area as shown in Figure 2 is invoked in the month of August annually and when triggered in September. However, starting in 2008, the fleet has been exempt from these closures because of their participation in the salmon bycatch reduction intercooperative agreement, which was implemented in 2007 under Amendment 84.

Table 1. Composition of non-Chinook salmon by species from 2001-2007

Year	sockeye	coho	pink	chum	Total	% chum
2001	12	173	9	51,001	51,195	99.6%
2002	2	80	43	66,244	66,369	99.8%
2003	29	24	72	138,772	138,897	99.9%
2004	13	139	107	352,780	353,039	99.9%
2005	11	28	134	505,801	505,974	100.0%
2006	11	34	235	221,965	222,245	99.9%
2007	3	139	39	75,249	75,430	99.8%

*source NMFS catch accounting, extrapolated from sampled hauls only

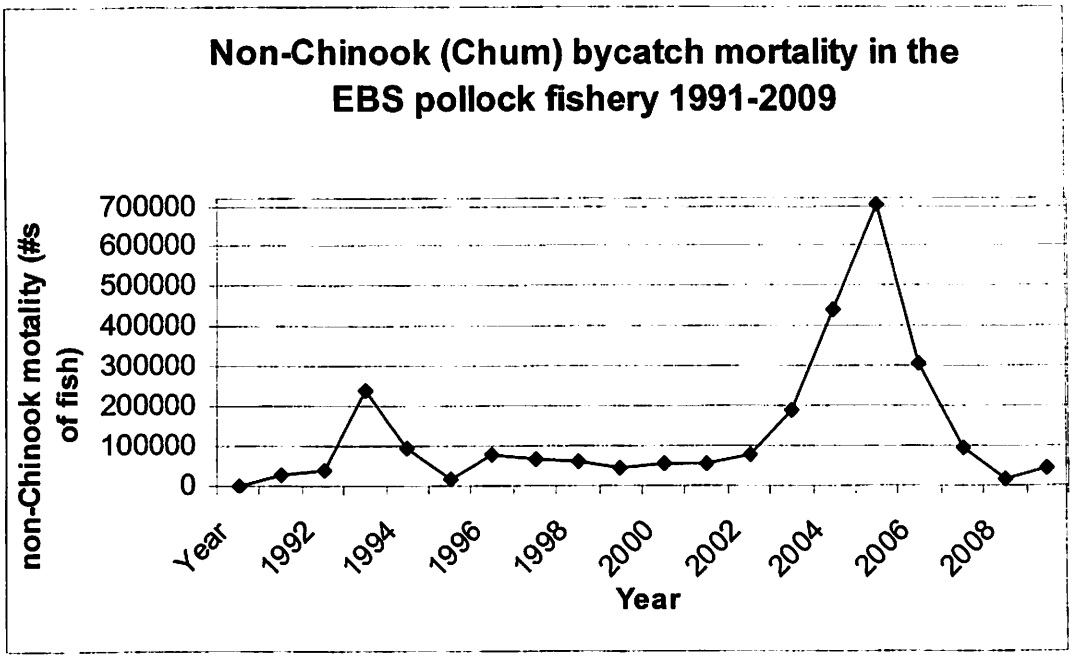

Figure 1. **Non-Chinook salmon bycatch mortality in the EBS pollock trawl fishery 1991-2009. Note 1991-1993 values do not include CDQ. 2009 data through 10/10/09**

Table 2. **Non-Chinook salmon catch (numbers of fish) in the BSAI pollock trawl fishery (all sectors) 1991-2009, CDQ is indicated separately and by season where available. 'na' indicates that data were not available in that year. 2009 data through 10/10/09**

Year	Annual with CDQ	Annual without CDQ	Annual CDQ only	A season With CDQ	B season With CDQ	A season Without CDQ	B season Without CDQ	A season CDQ only	B season CDQ only
1991	Na	28,951	na	na	na	2,850	26,101	na	na
1992	na	40,274	na	na	na	1,951	38,324	na	na
1993	na	242,191	na	na	na	1,594	240,597	na	na
1994	92,672	81,508	11,165	3,991	88,681	3,682	77,825	309	10,856
1995	19,264	18,678	585	1,708	17,556	1,578	17,100	130	456
1996	77,236	74,977	2,259	222	77,014	177	74,800	45	2,214
1997	65,988	61,759	4,229	2,083	63,904	1,991	59,767	92	4,137
1998	64,042	63,127	915	4,002	60,040	3,914	59,213	88	827
1999	45,172	44,610	562	362	44,810	349	44,261	13	549
2000	58,571	56,867	1,704	213	58,358	148	56,719	65	1,639
2001	57,007	53,904	3,103	2,386	54,621	2,213	51,691	173	2,930
2002	80,782	77,178	3,604	1,377	79,404	1,356	75,821	21	3,453
2003	189,184	180,782	8,402	3,834	185,350	3,597	177,185	237	8,165
2004	440,472	430,284	10,188	422	440.050	395	429,889	27	10,161
2005	704,590	696,880	7,710	595	703,995	563	696,317	32	7,678
2006	309,643	308,429	1,214	1,332	308,311	1,266	307,163	66	1,148
2007	93,660	87,191	6,469	8,523	85,137	7,368	79,823	1,155	5,314
2008	15,423	14,992	431	320	15,103	247	14,745	73	358
2009	45,905	44,911	994						

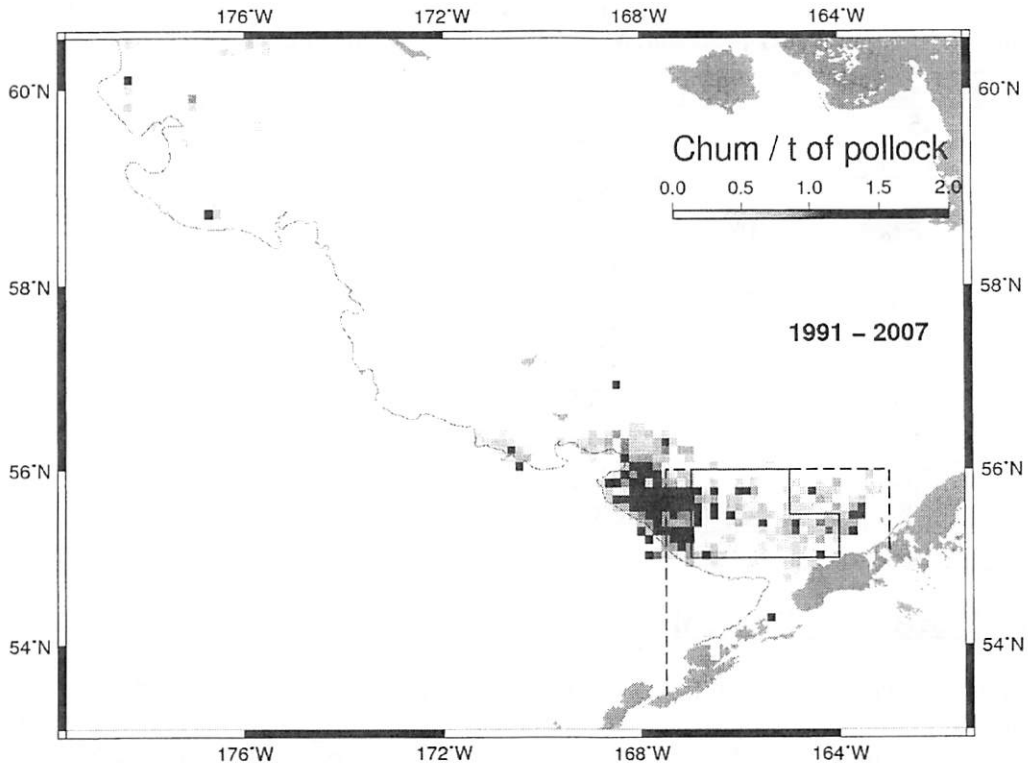

Figure 2. Historical chum B-season bycatch rates 1991-2007. Note the Chum Salmon Savings Area closure (solid line) and the Catcher Vessel Operational Area (dotted line).

Bycatch by sector from 1997-2009 is summarized in Table 3. Annual percentage contribution to the total amount by year and sector (non-CDQ) from 1997-2009 is summarized in Table 4.

Table 3 Non-Chinook bycatch in the EBS pollock trawl fishery 1997-2008 by sector. CP = catcher processor, M= Mothership, S = Shoreside catcher vessel fleet. CDQ where available is listed separately by the sector in which the salmon was caught. For confidentiality reasons CDQ catch by sector since 2008 cannot be listed separately. 2009 data through 10/10/09 Source NMFS catch accounting

Year	CP	M	S	CDQ(total)	Total
1997	23,131	15,018	23,610	4,229	65,988
1998	8,119	6,750	49,173	0	64,042
1999	2,312	212	42,087	661	45,271
2000	4,930	509	51,428	1,704	58,571
2001	20,356	8,495	25,052	3,103	57,007
2002	9,303	13,873	54,002	3,474	80,652
2003	22,831	11,895	152,053	8,356	195,135
2004	76,159	13,330	347,940	10,197	447,626
2005	63,266	15,314	619,691	7,693	705,963
2006	18,180	2,013	289,150	1,202	310,545
2007	27,245	5,427	54,920	6,480	94,071
2008	1,562	641	12,512	425	15,140
2009	3,878	1,733	39,412	950	45,973

Table 4 Percent of total annual non-Chinook salmon catch by sector by year 1997-2007 (CDQ not included in sector totals) CP = catcher processor, M= Mothership, S = Shoreside catcher vessel fleet.

Year	CP	M	S
1997	35%	23%	36%
1998	13%	11%	77%
1999	5%	0%	93%
2000	8%	1%	88%
2001	36%	15%	44%
2002	12%	17%	67%
2003	12%	6%	78%
2004	17%	3%	78%
2005	9%	2%	88%
2006	6%	1%	93%
2007	29%	6%	58%
2008	10%	1%	83%
2009	8%	2%	86%

HATCHERY RELEASES OF CHUM

Commercial salmon fisheries exist around the Pacific Rim with most countries releasing salmon fry in varying amounts by species. The North Pacific Anadromous Fish Commission summarizes information on hatchery releases by country and by area where available. Reports submitted to the NPAFC were used to summarize hatchery information by Country and by US state below (Table 5, Table 6). For more information see the following: Russia (Anon., 2007; TINRO-centre 2008; 2006; 2005); Canada (Cook and Irvine, 2007); USA (Josephson 2008; 2007; Eggers, 2006; 2005; Bartlett, 2008, 2007; 2006; 2005); Korea (SRT 2008, 2007, 2006, 2005). Chum salmon hatchery releases by country are shown below in Table 5.

For chum salmon, Japanese hatchery releases far exceed releases by any other Pacific Rim country. This is followed by the US and Russia. A further break-out of hatchery releases by area in the US show that the majority of chum salmon fry releases occur in the Alaska region (Table 6).

Combined Asian hatchery releases in 2007 (Russia, Japan, Korea) account for 74% of the total releases while Alaskan chum releases account for 20% of the total releases. Chum enhancement projects in Alaska are not active in the AYK region.

Table 5. **Hatchery releases of juvenile chum salmon in millions of fish.**

Year	Russia	Japan	Korea	Canada	US	Total
1999	278.7	1,867.9	21.5	172.0	520.8	2,860.9
2000	326.1	1,817.4	19.0	124.1	546.5	2,833.1
2001	316.0	1,831.2	5.3	75.8	493.8	2,722.1
2002	306.8	1,851.6	10.5	155.3	507.2	2,831.4
2003	363.2	1,840.6	14.7	136.7	496.3	2,851.5
2004	363.1	1,817.0	12.9	105.2	630.2	2,928.4
2005	387.3	1,844.0	10.9	131.8	596.9	2,970.9
2006	344.3	1,858.0	7.3	107.1	578.8	2,895.5
2007	350.4	1,870.0	13.8	142.0	653.3	3,029.5
2008	*	*	16.6	*	*	

*2008 data not yet available

Table 6. **US west coast hatchery releases of juvenile chum salmon in millions of fish**

Year	Alaska	Washington	Oregon	California	Idaho	Combined WA/OR/CA/ID	Total
1999	460.9	59.9	0	0	0		520.8
2000	507.7	38.8	0	0	0		546.5
2001	465.4	28.4	0	0	0		493.8
2002	450.8	56.4	0	0	0		507.2
2003	435.6	60.7	0	0	0		496.3
2004	578.5					51.7	630.2
2005	549.0					47.9	596.9
2006	541.2					37.6	578.8
2007	604.7	48.6	0	0	0	48.6	653.3

STOCK OF ORIGIN INFORMATION FOR CHUM BYCATCH

There are three published reports describing the stock composition of the chum bycatch from the Bering Sea/Aleutian Island groundfish fishery and these studies used samples collected during the 1994, 1995, and 1996 seasons.

First, a scale pattern analysis (SPA) was used to estimate the stock composition of the 1994 chum bycatch. Based on SPA of the 0.3 aged fish, the stock estimation of the chum bycatch was partitioned from Asia (50%), western and central Alaska (18%), and SE Alaska, British Columbia and Washington (32%) (Patton et al., 1998). Results indicated that the stock composition varied by date and statistical area. The authors used their results to project that 13,800 of the 74,500 chum salmon captured in the 1994 "B" bycatch had originated from western Alaska. Based on escapement levels of 8.2 million fish to central and western Alaska, they concluded that the total effects on stocks from those regions was negligible relative to the overall run sizes.

Second, a genetic analysis was completed for the 1994 and 1995 chum bycatch (Wilmot et al., 1998). This study used a genetic baseline of 77 populations surveyed for 20 loci. Based on a sample set of 457 chum salmon harvested from the 1994 "B" fishery, the stock composition was partitioned to Asia (39-55%), western Alaska (20-35%), and southeast Alaska, British Columbia, and Washington (21-29%). Based on a much larger sample set of 1,853 chum salmon harvested from the 1995 "B" fishery (11% of the total bycatch), fish were partitioned back to Asia (13-51%), western Alaska (33-53%), and southeast Alaska, British Columbia, and Washington (9-46%). The range of estimates reflect differences in the stocks present during different time periods and areas of capture in the fishery.

Third, a genetic analysis was completed for the 1996 groundfish fishery (Seeb et al., 2004). In this analysis, a baseline representing 356 populations assayed for 20 allozyme markers was used. 2,897 immature chum salmon from the 1998 "B" fishery were analyzed and the stock composition estimates were partitioned to Asia (25%), northwest Alaska and Alaska Peninsula (20%), and southeast Alaska, British Columbia, and Washington (55%) (estimates were roughly partitioned from a bar graph and may contain potential errors).

In addition, scale analysis was used to age affected chum from the 1993 "B" season bycatch (Myers et al., 1994). This analysis showed that the following ages were represented 0.2 (22%), 0.3 (65%), 0.4 (12%), and 0.5 (1%). While a specific stock composition analysis was not completed for that particular study, many characteristics showed stratification of chum stocks in the Bering Sea including (1) reduced amount of growth in the 3rd year (a characteristic of Asian fish) and (2) differences in ages of the affected fish based on the month and area in which they were collected.

DESCRIPTION OF NON-CHINOOK SALMON (CHUM) ALTERNATIVES

The following alternatives are currently under consideration by the Council. The alternative description below includes all amendments made at the June 2009 Council meeting. To meet Council intent in this motions regarding a comparison with recent bycatch levels and rates, tables summarizing the current historical averages and sector allocations (based upon combinations of weighting historical with pro-rata pollock allocations) under the current time frames for the alternatives listed below in comparison with more recent time periods (through 2009) for averaging are included in Appendix 2.

1.1 Alternative 1: Status Quo (non-Chinook)

Alternative 1 retains the current program of Chum Salmon Savings Area (SSA) closures triggered by separate non-CDQ and CDQ caps by species with the fleet's exemption to these closures per regulations for Amendment 84. If the Chinook salmon bycatch management measures the Council recommended in April 2009 under Amendment 91 are approved, the Chinook salmon will no longer be reequired to be included in the intercooperative agreement (ICA) that establishes a "voluntary rolling hot spot" closure system in the BS pollock fishery. The ICA would be required to include only non-Chinook salmon.

The Chum Salmon Savings Area was established in 1994 by emergency rule, and then formalized through Amendment 35 to the BSAI Groundfish FMP in 1995 (ADF&G 1995b). This area is closed to pollock trawling from August 1 through August 31. Additionally, if 42,000[1] 'other" salmon are caught in the Catcher Vessel Operational Area (CVOA) during the period August 15-October 14, the Chum Salmon Savings Area remains closed to directed fishing for pollock for the remainder of the period September 1 through October 14.

[1] This number is inclusive of the allocation to CDQ groups. Non-CDQ 'other salmon' limit is 38,850.

Amendment 84 to the BSAI groundfish FMP exempted vessels from both the Chum and Chinook SSAs if triggered provided they participate in the salmon bycatch inter-cooperative agreement (ICA) with the voluntary rolling hot spot (VRHS) system.

Under the status quo, the CDQ Program would continue to receive allocations of 10.7 percent of the non-Chinook salmon PSC limit as "prohibited species quota reserves" or PSQ reserves. The PSQ reserves are further allocated among the six CDQ groups based on percentage allocations approved by NMFS on August 8, 2005. The salmon savings areas would continue to be closed to vessels directed fishing for pollock CDQ for a particular CDQ group when that group's salmon PSQ is reached. The CDQ groups would continue to be exempt from the salmon savings area closures if they participate in the salmon bycatch intercooperative agreement.

1.2 Alternative 2: Hard Cap (non-Chinook)

This alternative would establish a non-Chinook salmon bycatch cap on the pollock fishery which, when reached would require all directed pollock fishing to cease. Only those non-Chinook caught by the directed pollock fleet would accrue towards the cap and fishery closures upon achieving the cap would apply only to directed fishing for pollock.

In order to select this alternative, the Council must choose one of the options under Component 1, Hard Cap Formulation (see below). If the Council does not select any options under the further components, Alternative 2 would be applied at the fishery level, as a single hard cap to all combined sectors. The CDQ Program would receive an allocation of 10.7% of any hard cap established for non-Chinook salmon in the BS. The CDQ allocation would be further allocated among the six CDQ groups based on percentage allocations currently in effect. Each CDQ group would be prohibited from exceeding its non-Chinook salmon allocation. This prohibition would require the CDQ group to stop directed fishing for pollock CDQ once its cap is reached because further directed fishing for pollock would likely result in exceeding the cap.

The remaining 89.3% of the hard cap would be allocated to the non-CDQ sectors (inshore catcher vessel sector, offshore catcher processor sector, and mothership sector) combined. All bycatch of non-Chinook salmon by any vessels in any of these three sectors would accrue against the cap, and once the cap was reached, NMFS would prohibit directed fishing for pollock by all three of these sectors at the same time.

If the hard cap is to be subdivided by sector (under Component 2), two options are provided for the allocation. Options for sector transfer are included in Component 3. Further subdivision of an inshore sector cap to individual inshore cooperatives is discussed under Component 4 (cooperative provisions).

1.2.1 Component 1: Hard Cap Formulation

Component 1 would establish a hard cap number based upon a range of averages of historical numbers and other considerations as noted below. Component 1 sets the formulation for the overall cap: this can be either applied to the fishery as a whole, or applying Components 2 and 4 may be subdivided by sector (Component 2) and to cooperative (Component 4).

Option 1: Range of numbers for hard cap formulation

A range of numbers is established for consideration as hard caps for non-Chinook salmon. Table 5 lists the numbers in numerical order lowest to highest for overall caps. Here the CDQ allocation of the cap is 10.7% of the total cap, with the remainder for the combined non-CDQ fishery.

Table 7 Range of suboptions for hard cap for non-Chinook with breakout for CDQ allocation (10.7%) and remainder for non-CDQ fleet

	Non-Chinook	CDQ	Non-CDQ
i)	58,000	6,206	51,794
ii)	206,300	22,074	184,226
iii)	353,000	37,771	315,229
iv)	488,000	52,216	435,784

The following section provides the originating rationale (by suboption number) for the lowest and highest cap numbers listed in Table 7. Note cap numbers are not the exact historical calculation but rounded. Suboption (i) (58,000) the low end of the range of caps considered represents the 5 year average from 1997-2001 (58,176). Including historical year combinations prior to 2001 was chosen specifically in an attempt to be responsive to considerations relative to bycatch levels prior to accession to the Yukon River Agreement (signed in 2002). Suboption iv) is the three year average for 2004-2006. Suboptions ii and iii are mid-points between highest and lowest cap options.

1.2.2 Component 2: Sector Allocation

a) No sector allocation

Absent allocation to sectors, a default CDQ Program allocation of 10.7%, with the remaining 89.3% managed at the fishery-level (combined non-CDQ sectors).

b) Allocations to Inshore, Catcher Processor, Mothership and CDQ.

If this component is selected, the hard cap would be managed at the sector level for the fishery. This would result in separate sector level caps for the CDQ sector, the inshore catcher vessel (CV) fleet, the mothership fleet and the offshore catch processor (CP) fleet. The catch of salmon would be tabulated on a sector level basis, and if the total catch in that sector reaches the cap specified for that sector, NMFS would close directed fishing for pollock by that sector for the remainder of the season. The remaining sectors may continue to fish unless they too reach their specific sector level cap. Options for hard caps are as specified under component 1. Table 8 summarizes the relative percentages resulting from each of the different combinations of options for sector-specific allocation.

Option 1) Pro-rata to pollock AFA sector allocation: 10% of the cap to the CDQ sector, and the remaining allocated as follows: 50% inshore CV fleet; 10% for the mothership fleet; and 40% for the offshore CP fleet.

This option follows the percentage allocation established for pollock under the AFA. Application of these percentages results in the following range of caps by sector, based upon the range of caps in component 1. Note that here the CDQ allocation of salmon is slightly lower than that assumed as a default under component 1 (10% rather than 10.7%).

Under option 2, the subdivision of caps to each sector is now based upon historical average percent bycatch by sector over 3, 5 and 10 year time periods.

Option 2) Historical average of percent bycatch by sector using blended[2] CDQ rates

i) 2004-2006
ii) 2002-2006
iii) 1997-2006

Options 3-5 use an allocation scheme that weights relative contributions from the pro-rata percentage allocation and that from the calculated range of historical averages. As the Council did not specify over what time period the 'historical' allocation was to occur, these have been calculated for each average time period.

Option 3) Allocation based on 75% pro-rata and 25% historical

i) 2004-2006
ii) 2002-2006
iii) 1997-2006

Option 4) Allocation based on 50% pro-rata and 50% historical

i) 2004-2006
ii) 2002-2006
iii) 1997-2006

Option 3) Allocation based on 25% pro-rata and 75% historical

i) 2004-2006
ii) 2002-2006
iii) 1997-2006

Table 8 Sector split percentage allocations resulting from options 1-5.

Time Period for Average	Option	% pro-rata: historical	CDQ	Inshore CV	Mothership	Offshore CPs
NA (AFA)	1	100:0	10.0%	45.0%	9.0%	36.0%
2004-2006	2	0:100	2.6%	86.1%	2.1%	9.2%
	3	75:25	4.5%	75.8%	3.8%	15.9%
	4	50:50	6.3%	65.5%	5.5%	22.6%
	5	25:75	8.2%	55.3%	7.3%	29.3%
2002-2006	3	75:25	5.1%	71.6%	6.6%	16.7%
	4	50:50	6.7%	62.7%	7.4%	23.1%
	5	25:75	8.4%	53.9%	8.2%	29.6%
1997-2006	3	75:25	5.8%	66.6%	8.1%	19.5%
	4	50:50	7.2%	59.4%	8.4%	25.0%
	5	25:75	8.6%	52.2%	8.7%	30.5%

1.2.3 Component 3: Sector Transfer

Options[3] under this component may be selected only if the Council recommends allocating salmon bycatch among the sectors under Component 2.

Option 3a) No sector transfer

[2] See appendix 3 for a description of the blended CDQ calculation

[3] Language in these sections shown in strike-out represent the original language of the components and options prior to the June 2009 Council motion.

If the Council does recommend salmon bycatch allocations to the sectors under Component 2 but does not select one of these options, the salmon bycatch available to each sector could not change during the year and NMFS would close directed fishing for pollock once each sector reached its Chinook salmon bycatch allocation. The CDQ allocations would continue to be managed as they are under status quo, with further allocation of the salmon bycatch cap among the six CDQ groups, transferable allocations within the CDQ Program, and a prohibition against a CDQ group exceeding is salmon bycatch allocation.

Options 3b and 3c are mutually exclusive, which means that the Council may select Option 1 to allow transferable salmon bycatch allocations at the sector level or Option 2 to require NMFS to manage the reapportionment of salmon bycatch from one sector to another.

1.2.3.1 Option 1: Transferable salmon bycatch caps

Option 3b) Allow NMFS-approved transfers between sectors. ~~Transfer salmon bycatch among sectors (industry initiated)~~

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

a) 50%
b) 70%
c) 90%

If a transferring entity had completed all of its pollock harvest with some salmon remaining, it could only transfer up to a specified percent of that salmon bycatch to another entity with pollock still remaining for harvest. Under this circumstance, this transfer provision would mean that not all salmon bycatch allocated would be available for use by entities other than the original recipient of the allocation.

Transfers are voluntary requests, initiated by the entity receiving a salmon bycatch cap, for NMFS to move a specific amount of a salmon bycatch cap from one entity to another entity.

Option 3b would require that each sector receiving a transferable salmon bycatch cap be represented by a legal entity that could:

- represent all vessels eligible to participate in the particular AFA sector and receive an annual permit for a specific amount of salmon bycatch on behalf of all of those vessels,
- be authorized by all members of the sector to transfer all or a portion of the sector's salmon bycatch cap to another sector or to receive a salmon bycatch transfer from another sector on behalf of the members of the sector,
- be responsible for any penalties assessed for exceeding the sector's salmon bycatch cap (i.e., have an agent for service of process with respect to all owners and operators of vessels that are members of the legal entity).

Once transferable salmon bycatch hard caps are allocated to a legal entity representing an AFA sector or to a CDQ group, NMFS does not actively manage these allocations. Each entity receiving a transferable hard cap would be prohibited from exceeding that cap and would be responsible to control its pollock fishing to prevent exceeding its salmon bycatch cap. Any overages of the salmon bycatch cap would be reported to NMFS Enforcement for possible enforcement action against the responsible entity.

1.2.3.2 Option 3c: Rollover unused salmon bycatch to other sectors

Option 3c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing. ~~NMFS actively manages the salmon bycatch allocations to the non-CDQ sectors and would rollover~~

~~unused salmon bycatch to other sectors still fishing based on the proportion of pollock remaining for harvest.~~

A "rollover" is a management action taken by NMFS to "reapportion" or move salmon bycatch from one sector to another through a notice in the Federal Register. Rollovers are an alternative to allowing one sector to voluntarily transfer salmon bycatch to another sector.

Under this option, if a non-CDQ AFA sector has completed harvest of its pollock allocation without using all of its salmon bycatch allocation, and sufficient salmon bycatch remains to be reapportioned, NMFS would reapportion the unused amount of salmon bycatch to other AFA sectors, including CDQ. Any reapportionment of salmon bycatch by NMFS would be based on the proportion each sector represented of the total amount of pollock remaining for harvest by all sectors through the end of the year. Successive reapportionment actions would occur as each non-CDQ sector completes harvest of its pollock allocation.

The CDQ groups could receive rollovers of salmon bycatch from other sectors. However, because the CDQ groups will each receive a specific, transferable allocation of salmon bycatch (as occurs under status quo), unused salmon bycatch would not be reapportioned from an individual CDQ group to other CDQ groups or other AFA sectors. CDQ groups with unused salmon bycatch could transfer it to another CDQ group, as is currently allowed in the CDQ Program

1.2.4 Component 4: Cooperative provisions

Options under this component may be selected only if the Council recommends allocating salmon bycatch among the sectors under Component 2 and makes an allocation of salmon bycatch to the inshore sector. Component 4 would allow further allocation of transferable or non-transferable salmon bycatch allocations to the inshore cooperatives.

Each inshore cooperative and the inshore open access fishery (if the inshore open access fishery existed in a particular year) would receive a salmon allocation managed at the cooperative level. If the cooperative or open access fishery salmon cap is reached, the cooperative or open access fishery must stop fishing for pollock.

The initial allocation of salmon by cooperative within the shore-based CV fleet or to the open access fishery would be based upon the proportion of total sector pollock catch associated with the vessels in the cooperative or open access fishery. The annual pollock quota for this sector is divided up by applying a formula in the regulations which allocates catch to a cooperative or the open access fishery according to the specific sum of the catch history for the vessels in the cooperative or the open access fishery. Under 679.62(e)(1), the individual catch history of each vessel is equal to the sum of inshore pollock landings from the vessel's best 2 of the 3 years 1995 through 1997, and includes landings to catcher/processors for vessels that made landings of 500 mt or more to catcher/processors from 1995 through 1997. Each year, fishing permits are issued by cooperative, with the permit application listing the vessels added or subtracted. Fishing in the open access fishery is possible should a vessel leave their cooperative, and the shore-based CV quota allocation is partitioned to allow for an allocation to an open access fishery under these circumstances.

All inshore sector catcher vessels have been part of a cooperative since 2005. However, if this component is selected by the Council, regulations would accommodate allocations of an appropriate portion of the salmon bycatch cap to the open access fishery if, in the future, a vessel or vessels did not join a cooperative.

4a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the Co-op level for the inshore sector.

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

a) 50%
b) 70%
c) 90%

These options would only apply if the Council selected sector allocations under Component 2 and further allocated the inshore sector allocation among the cooperatives and the inshore open access fishery (if the inshore open access fishery existed in a particular year) under Component 4.

~~When a salmon cooperative cap is reached, the cooperative must stop fishing for pollock and may:~~

~~**Option 1)** Transfer (lease) its remaining pollock to another inshore cooperative for the remainder of the season or year. Allow inter cooperative transfers of pollock to the degree currently authorized by the AFA.~~

~~**Option 2)** Transfer salmon bycatch from other inshore cooperatives (industry initiated)~~

~~**Suboption:** Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:~~

~~d) 50%~~
~~e) 70%~~
~~f) 90%~~

~~The Council could select Option 1 or Option 2 or both.~~

1.3 Alternative 3: Triggered closures (non-Chinook)

Triggered closures are regulatory time area closures that are invoked when cap levels are reached. Cap levels for triggered closures would be formulated in a way similar to those specified under alternative 2.

If the trigger cap is not further allocated among the non-CDQ sectors under Component 3, sector allocation, the CDQ Program would receive an allocation of 10.7 percent of the BS Chinook salmon trigger cap. This CDQ allocation would be further allocated among the six CDQ groups based on percentage allocations currently in effect. Each CDQ group would be prohibited from directed fishing for pollock inside the closure area(s) when that group's trigger cap is reached.

1.3.1 Component 1: Trigger Cap Formulation and Application

Cap level:

a) 45,000
b) 58,000
c) 206,000
d) 353,000
e) 488,000

Application of Trigger Caps:
a) Apply trigger to all chum bycatch
b) Apply trigger to all chum bycatch in the CVOA
c) Apply trigger to all chum bycatch between specific dates

1.3.2 Component 2: Sector Allocation

For further description of these options see description under Alternative 2, components 1-2.

Option 1) Pro-rata to pollock AFA sector allocation: 10% of the cap to the CDQ sector, and the remaining allocated as follows: 50% inshore CV fleet; 10% for the mothership fleet; and 40% for the offshore CP fleet.

Option 2) Historical average of percent bycatch by sector using blended CDQ rates
- i) 2004-2006
- ii) 2002-2006
- iii) 1997-2006

Options 3-5 use an allocation scheme that weights relative contributions from the pro-rata percentage allocation and that from the calculated range of historical averages. As the Council did not specify over what time period the 'historical' allocation was to occur, these have been calculated for each average time period.

Option 3) Allocation based on 75% pro-rata and 25% historical
- i) 2004-2006
- ii) 2002-2006
- iii) 1997-2006

Option 4) Allocation based on 50% pro-rata and 50% historical
- i) 2004-2006
- ii) 2002-2006
- iii) 1997-2006

Option 3) Allocation based on 25% pro-rata and 75% historical
- i) 2004-2006
- ii) 2002-2006
- iii) 1997-2006

1.3.3 Component 3: Sector Transfer

a) No transfers or rollovers
b) Allow NMFS-approved transfers between sectors
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%
c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

1) 50%
2) 70%
3) 90%

~~**Option 1)** Transfer salmon bycatch among sectors (industry initiated)~~

~~**Suboption:** Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:~~

~~a) 50%~~
~~b) 70%~~
~~c) 90%~~

~~**Option 2)** NMFS will rollover unused salmon bycatch to other sectors and other cooperatives still fishing based on the proportion of pollock remaining for harvest.~~

The above options are mutually exclusive.

Components 4: Cooperative Provisions

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

1.3.4 Component 5: Area option

Option 1: Rate-based closure configuration

This closure was identified by rate-based analysis delineating regions where average bycatch rate exceeded 0.9 chum salmon per ton of pollock (Figure 3). Over the entire B season, this area accounts for 49% of the chum salmon on average (1994-2007) and only 12% of the pollock catch (Figure 3)

Table 9 Area closure coordinates

55° 53'	165° 30'	56° 00'	169° 15'
55° 00'	166° 38'	56° 23'	167° 23'
55° 00'	167° 45'	55° 53'	167° 00'
55° 23'	168° 15'	55° 53'	165° 30'

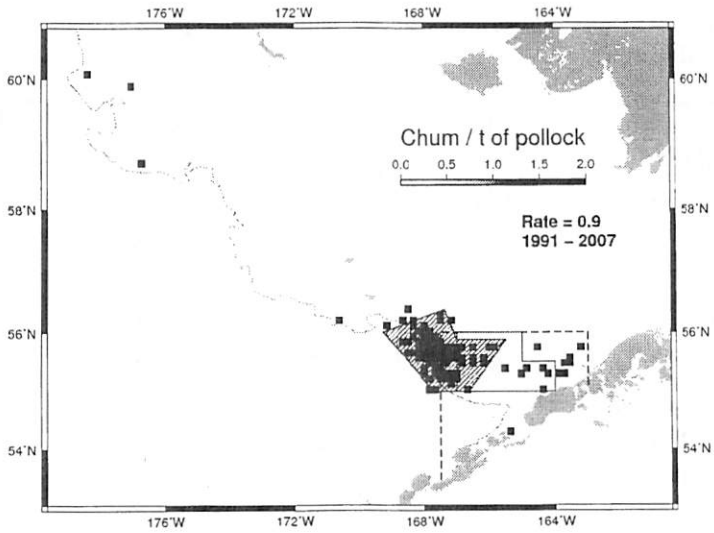

Figure 3 B-season chum salmon proposed closure (red-hatched closure) over different rates based on 1991-2007 NMFS observer data. Filled in 10x10km cells represent locations where the average bycatch rate exceeded 0.9 chum salmon per t of pollock. Existing Chum Salmon Savings Area closure shown in pink line (no hatching).

Table 10 Average seasonal proportions by periods for 1993-2007 based on NMFS observer data (effort is relative hours towed, salmon are relative numbers, and pollock are relative tons).

Periods	Seasonal pollock proportion	Seasonal "other" salmon proportion	Seasonal effort proportion
Jun 1-7	0%	1%	1%
Jun 8-14	1%	1%	1%
Jun 15-21	2%	2%	2%
Jun 22-30	4%	3%	3%
Jul 1-7	4%	4%	3%
Jul 8-14	4%	2%	4%
Jul 15-21	4%	6%	3%
Jul 22-31	7%	6%	6%
Aug 1-7	5%	9%	5%
Aug 8-14	6%	5%	5%
Aug 15-21	7%	10%	7%
Aug 22-31	11%	7%	11%
Sep 1-7	9%	9%	9%
Sep 8-14	8%	9%	9%
Sep 15-21	8%	9%	9%
Sep 22-30	8%	5%	9%
Oct 1-7	5%	5%	6%
Oct 8-14	4%	4%	4%
Oct 15-21	2%	2%	3%
Oct 22-31	2%	1%	2%

Table 11 Average 1993-2007 seasonal pattern of other salmon bycatch per t of pollock in and outside of candidate closure area by different periods.

Periods	Rate In	Rate Outside	Pollock inside	Chum Inside	Effort Inside
All of B	1.216	0.144	5%	33%	5%
Jun 1-7	-	0.338	0%	0%	0%
Jun 8-14	0.221	0.186	0%	0%	0%
Jun 15-21	0.034	0.283	3%	0%	3%
Jun 22-30	0.372	0.161	3%	6%	3%
Jul 1-7	0.040	0.255	5%	1%	4%
Jul 8-14	0.289	0.104	12%	27%	11%
Jul 15-21	2.473	0.118	8%	66%	8%
Jul 22-31	0.965	0.131	5%	28%	5%
Aug 1-7	3.137	0.138	8%	66%	7%
Aug 8-14	0.607	0.166	6%	18%	6%
Aug 15-21	1.363	0.200	6%	32%	7%
Aug 22-31	0.833	0.109	3%	21%	4%
Sep 1-7	0.970	0.148	6%	30%	7%
Sep 8-14	2.199	0.137	3%	37%	4%
Sep 15-21	1.519	0.128	6%	44%	6%
Sep 22-30	0.963	0.108	4%	25%	4%
Oct 1-7	0.940	0.128	6%	33%	6%
Oct 8-14	1.538	0.153	3%	26%	3%
Oct 15-21	0.817	0.152	7%	29%	7%
Oct 22-31	0.383	0.111	14%	37%	12%

Option 2: Existing Chum salmon savings area

This closure is the existing Chum salmon savings area closure (Figure 3). This area was initially designed based upon average historical bycatch between 1990-1993, representing 33%-54% of the total non-Chinook bycatch over those years.

1.3.5 Component 6: Timing Option – Dates of Area Closure

a) Existing closure dates (August 1 – August 31 and September 1 through October 14 if trigger is reached.)
b) New closure dates

1.3.6 Component 7: Rolling Hot Spot (RHS) Exemption

Similar to status quo, participants in a vessel-level (platform level for Mothership fleet) RHS would be exempt from regulatory triggered closure(s).

a) Sub-option: RHS regulations would contain an ICA provision that the regulatory trigger closure (as adopted in Component 5) apply to participants that do not maintain a certain level of rate-based chum salmon bycatch performance.

POTENTIAL INTERACTIONS BETWEEN CHINOOK BYCATCH MANAGEMENT PROGRAM AND ALTERNATIVES UNDER CONSIDERATION FOR CHUM BYCATCH MANAGEMENT

The Council took final action in April 2009 on Amendment 91 to the BSAI FMP to implement Chinook salmon bycatch management program for the BS pollock fishery. This program includes such features as transferable caps at the sector level for the catcher/processor and mothership sectors; for inshore cooperatives; and for CDQ groups; a two-tiered cap level whereby a less restrictive cap (60,000 Chinook salmon) is available to participants in a NMFS approved incentive program agreement (IPA) intended to keep bycatch below the cap level and a performance standard which if exceeded three times in 7 years results in a permanent cap at the lower cap level (47,591 Chinook salmon).

The proposed rule for this program is under development and implementation of this program under Amendment 91 is anticipated in January 2011. Due to the complex nature of this proposed program, the Council wished to evaluate to what extent additional management restrictions on the BS pollock fleet may complicate the ability to manage two bycatch programs concurrently placed on the same fishing fleet. Below are summarized some of the unique aspects of this proposed program and where it may (or may not) interact with any proposed bycatch regulations for chum management that could arise from the alternatives currently under consideration. These may not represent a comprehensive listing however of the potential interactions between a proposed chum bycatch program and the Chinook bycatch program however and additional considerations will likely arise as alternatives and the subsequent analysis thereof move forward.

Salmon sampling
Under Amendment 91, NMFS is proposing to require that observers count all salmon of any species that are caught in the BS pollock fishery (a "census" of salmon bycatch). The salmon will be identified and counted by species. In addition observer coverage would be increased to 100% for all inshore catcher vessels. Thus, measures to better enumerate Chinook salmon under Amendment 91 also will improve the enumeration of chum salmon and other species of salmon. Therefore, few, if any, additional monitoring and enforcement requirements should be necessary to implement any of the alternatives considered for revisions to chum salmon bycatch management measures.

Transferable allocations
If transferable allocation are considered as part of the Council's preferred alternative for chum bycatch management (as with Chinook), management measures are greatly simplified if the same organizational structure is followed for the allocating entity. This means that management is simplified if the allocations of chum or non-Chinook salmon bycatch are made to the same entity as with Chinook (i.e. sector level, CDQ group or in the case of the inshore sector, cooperative level). The non-Chinook program could then have similar accounting structure for management of transferable caps

Incentive Program Agreement (IPA)
From a management perspective, there is no reason why the IPA aspect of the Chinook program (with the two tiered cap) would need to include chum under a new chum management program. A separate chum bycatch allocation could be managed without being a part of the IPA. However, there may be policy reasons for the Council to recommend including chum salmon in the management program developed for Chinook salmon, including the IPAs. If the Council chooses to not include chum salmon in a management program similar to that developed for Chinook, the analysis should include an explanation of why this approach was not considered appropriate for chum salmon.

Current area closure
If a hard cap were chosen as a management measure for chum (whether allocated to the fishery level or sector/cooperative level), there would be no need to retain the existing Chum salmon savings area, or exemption from the area closure for those participating in an ICA. Regulations for chum will be modified due to the implementation of Amendment 91.

Annual reporting requirements
Annual reporting requirements were considered under amendment 91 as well as data collection needed to annually evaluate the efficacy of the IPA programs. Specific questions that should be addressed in conjunction with chum management measures include: are there changes to the current annual reporting requirements (as part of the exception to CSSAs under Amendment 84) that would be recommended to better monitor and evaluate chum bycatch management? Should new alternatives be crafted by the Council in addition to the current suite of hard caps and area closures (i.e. per coordinating chum management into an IPA structure), what if any additional data would need to be collected to best evaluate the efficacy of this program?

Data collection program
The Council currently is considering a trailing amendment that would implement a new data collection program aimed at collecting the data and relevant analyses thereof to evaluate the efficacy of the IPAs under the new program. The initial review draft of the Chinook data collection program EA/RIR/IRFA is available at http://fakr.noaa.gov/npfmc/current_issues/bycatch/Chinookbycatchdata909.pdf. The public review draft incorporating the Council motion from October 2009 will be available prior to final action by the Council in December 2009. Consideration could be given to whether or not data collection requirements under the trailing amendment for Chinook would be sufficient for chum as well depending upon the direction of the alternatives under consideration?

Trigger closure
In considering a new triggered closure under Alternative 3, consideration in the analysis of the impact of these closures will be given to the potential additive effect these closures may have on constraining the pollock fleet in conjunction with the new Chinook program. Consideration must be given in developing alternatives as to post-delivery transfers should transferable trigger caps be considered for area closures. A transferable trigger cap for an area closure with a post-delivery transfer capability would indicate that an entity would be closed out of the area upon reaching their proportion of an area cap, but with post-delivery transfer ability, be able to transit back into the area after completing sufficient post-delivery transfer. This is different from the post-delivery transfer allowed under Amendment 91 where it is intended to protect against overages of a proportion of a hard cap. Under the Chinook program, post-delivery transfers allow an entity to achieve a zero balance and protect themselves against exceeding a cap, but the entity is then prohibited from continuing to fish for the remainder of that season. The consequences of reaching a cap for an area closure are different than under a hard cap as with amendment 91.

Increased enforcement considerations will also need to be evaluated. Enforcement of triggered time/area closures requires different capabilities than enforcement of hard caps under the Chinook program. Alternative 3 component 1, application of Trigger caps, also considers different accounting mechanisms for the cap. Specifically these options include options to account only for bycatch within the CVOA (as with the current CSSA accounting period) and accounting for bycatch only between specific dates (again the current CSSA cap accrues within the CVOA only between August 14 and September 14). There would be an additional management complexity in application and management of transferable caps accruing within only specified areas and within specific date ranges that are in addition to other issues on transferable caps for chum bycatch as noted previously.

Impacts on industry
The issues highlighted above are related to NMFS management of any additional program and complexities. However there are additional constraints placed upon industry of any layered program of bycatch management that should also be considered. Triggered closures would likely place less of an additional constraint on the pollock fleet than hard caps for chum bycatch. If a chum program is structured to parallel a Chinook program (transferable hard caps issued to specific sectors and cooperatives) then the fleet would need to make continual operational decisions to balance the two.

CONSIDERATIONS FOR ANALYSIS

The initial review draft of this analysis will be prepared as an Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA). Consideration of whether an Environmental Impact Statement is necessary for this action will be done after completion and review of the initial draft EA/RIR/IRFA. An action plan providing additional information on proposed timing and analytical staff for this analysis will be provided at the December Council meeting.

COUNCIL ACTION AT THIS MEETING

The Council at this meeting may choose to do the following:

1. Review and revise as necessary the current suite of alternatives for chum salmon bycatch management measures for the EBS pollock fleet
2. Review action plan and discuss timing for analytical work and Council actions for this analysis

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Appendix 1 Council motion October 2009
C-4(a) Bering Sea Chum Salmon Bycatch Analysis

The Council recommends staff develop an extended discussion paper with the recommendations included below, and including a look at the interactions that might be expected between the Chinook salmon program and these options and those recommended in the discussion paper; additionally the discussion paper shall be provided to the Salmon Bycatch Workgroup and the results of that review be submitted to the Council.

Alternative 1 – Status Quo

Alternative 1 retains the current program of the Chum Salmon Savings Area (SSA) closures triggered by separate non-CDQ and CDQ caps with the fleet's exemption to these closures per regulations for Amendment 84 and as modified by the Amendment 91 Chinook bycatch action.

Alternative 2 – Hard Cap

Component 1: Hard Cap Formulation (with CDQ allocation of 10.7%)

a) 58,000
b) 206,000
c) 353,000
d) 488,000

Component 2: Sector Allocation

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
    1) Pro-rata to pollock AFA pollock sector allocation
    2) Historical average
        i. 2004-2006
        ii. 2002-2006
        iii. 1997-2006
    3) Allocation based on 75% pro-rata and 25% historical
    4) Allocation based on 50% pro-rata and 50% historical
    5) Allocation based on 25% pro-rata and 75% historical

Component 3: Sector Transfer

a) No transfers or rollovers
b) Allow NMFS-approved transfers between sectors
    Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
        1) 50%
        2) 70%
        3) 90%
c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Component 4: Cooperative Provision

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

Alternative 3 – Trigger Closure

Component 1: Trigger Cap Formulation

a) 45,000
b) 58,000
c) 206,000
d) 353,000
e) 488,000

Application of Trigger Caps

a) Apply trigger to all chum bycatch
b) Apply trigger to all chum bycatch in the CVOA
c) Apply trigger to all chum bycatch between specific dates

Component 2: Sector allocation

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
   1) Pro-rata to pollock AFA pollock sector allocation
   2) Historical average
      i. 2004-2006
      ii. 2002-2006
      iii. 1997-2006
   3) Allocation based on 75% pro-rata and 25% historical
   4) Allocation based on 50% pro-rata and 50% historical
   5) Allocation based on 25% pro-rata and 75% historical

Component 3: Sector Transfer

d) No transfers or rollovers
e) Allow NMFS-approved transfers between sectors
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   4) 50%
   5) 70%
   6) 90%
f) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

4) 50%
5) 70%
6) 90%

Components 4: Cooperative Provisions

b) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

1) 50%
2) 70%
3) 90%

Component 5: Area Option

a) Area identified in October, 2008 discussion paper
b) Existing Chum Salmon Savings Area (differs from status quo with application of other components)

Component 6: Timing Option – Dates of Area Closure

c) Existing closure dates (August 1 – August 31 and September 1 through October 14 if trigger is reached.)
d) New closure dates

Component 7: Rolling Hot Spot (RHS) Exemption – Similar to status quo, participants in a vessel-level (platform level for Mothership fleet) RHS would be exempt from regulatory triggered closure(s).

b) Sub-option: RHS regulations would contain an ICA provision that the regulatory trigger closure (as adopted in Component 5) apply to participants that do not maintain a certain level of rate-based chum salmon bycatch performance.

Further recommendations for the discussion paper include: (a) compile available data on recent bycatch rates; and (b) use a blended rate of CDQ and CDQ partners' bycatch for calculating historical bycatch rates.

Appendix 2
COMPARISON OF ALTERNATIVES WITH RECENT AVERAGES

Per Council request in their June motion, a comparison is shown below of the use of recent years (for averaging historical time periods) with the caps and sector allocations under consideration in the suite of alternatives.

Table 12 Comparison of historical averages using current alternatives historical time periods with more recent 3-, 5-, and 10-yr averages.

Time period (current alternative set)	Average (# of salmon)	Time period (more recent 3-, 5-, 10- years)	Average (# of salmon)
2004-2006	484,895	2007-2009	51,629
2002-2006	344,898	2005-2009	233,820
1997-2006	201,195	2000-2009	199,489
1997-2001	57,493		

Table 13 Comparison of sector allocation percentages from current alternative historical time periods with more recent 3-, 5-, and 10-yr averages.

		Percentage Historical (over noted Time frame) to % pro-rata (AFA)								
Current Time Period	Sector	100%	75%/25%	50%/50%	25%/75%	Recent Time Period	Sector	100%	75%/25%	50%/50%	25%/75%
2004-2006	CP	9.2%	15.9%	22.6%	29.3%	2007-2009	CP	14.4%	19.8%	25.2%	30.6%
	M	2.1%	3.8%	5.5%	7.3%		M	5.6%	6.5%	7.3%	8.2%
	S	86.1%	75.8%	65.5%	55.3%		S	75.6%	67.9%	60.3%	52.6%
	CDQ	2.6%	4.5%	6.3%	8.2%		CDQ	4.4%	5.8%	7.2%	8.6%
2002-2006	CP	10.2%	16.7%	23.1%	29.6%	2005-2009	CP	11.1%	17.3%	23.6%	29.8%
	M	5.8%	6.6%	7.4%	8.2%		M	4.0%	5.3%	6.5%	7.8%
	S	80.5%	71.6%	62.7%	53.9%		S	81.5%	72.4%	63.3%	54.1%
	CDQ	3.5%	5.1%	6.7%	8.4%		CDQ	3.4%	5.0%	6.7%	8.3%
1997-2006	CP	14.0%	19.5%	25.0%	30.5%	2000-2009	CP	13.4%	19.1%	24.7%	30.4%
	M	7.9%	8.1%	8.4%	8.7%		M	6.2%	6.9%	7.6%	8.3%
	S	73.8%	66.6%	59.4%	52.2%		S	76.0%	68.3%	60.5%	52.8%
	CDQ	4.4%	5.8%	7.2%	8.6%		CDQ	4.4%	5.8%	7.2%	8.6%

Appendix 3

Blended CDQ adjustment:
The number of Chinook salmon recorded as CDQ bycatch within each of the two CDQ partner sectors (CDQ groups partner with operations participating in the mothership and catcher processor sectors) was summed with the number of Chinook salmon recorded within the respective CDQ partner sector as non-CDQ for each year. Similarly, the volume of CDQ and non-CDQ pollock harvested in each year was summed. This combined pool of CDQ and non-CDQ Chinook salmon was divided by the combined pool of CDQ and non-CDQ pollock for an average Chinook salmon bycatch rate across CDQ and non-CDQ harvests for each CDQ partner sector. This average bycatch rate was multiplied by the pollock associated with the CDQ harvests to calculate an 'adjusted' number of CDQ Chinook salmon taken as bycatch in each year and season, and was multiplied by the pollock associated with the non-CDQ harvests to calculate an 'adjusted' non-CDQ number of Chinook salmon in each year the partner sectors. These adjusted numbers of Chinook salmon within each sector are used to calculate adjusted proportion of salmon bycatch by sector and season. This adjustment only affects the inshore catcher vessel sector in 1997, 1999 and 2000 and for all other years this adjustment is limited to the other two sectors.

Salmon Bycatch Workgroup meeting minutes

The NPFMC Salmon Bycatch Workgroup convened at 9am on October 29th, 2009 at the Clarion Suites Hotel in Anchorage, AK.

Members of the workgroup were the following:
Eric Olson, co-chair
Stephanie Madsen, co-chair
Becca Robbins Gisclair
Karl Haflinger
John Gruver
Robin Samuelson (for Paul Peyton)
Michael Smith
Jennifer Hooper
Vince Webster

Staff: Diana Stram (NPFMC)

Members of the public and state and agency staff in attendance included the following:
Kevin Keith (NSEDC), Dani Evenson (ADF&G), Ragnar Alstrom (YDFDA), Gene Sandone (Sandone Consulting), Don Rivard (FWS/OSM), Paul Manumik Sr. (YDFDA), Frank Alstrom Jr. (YDFDA), Simon Andrews (YDFDA), Emanuel Keyes (YDFDA), Carl Walker (YDFDA), Stefanie Moreland (ADF&G), Neil Rodriguez (CVRF), Brent Paine (UCB), Charlie Lean (NSEDC), Mary McDowell (PSPA), Paige Drobny (TCC), Scott Miller (NMFS), Anne Vanderhoeven (BBEDC), Chris Oliver (NPFMC), Verner Wilson (WWF), David Witherell (NPFMC), Paul Peyton (BBEDC), Nicole Kimball (NPFMC), Seanbob Kelly (NMFS), Angelique Anderson (CVRF), Kris Norosz (Icicle), Thomas C. Stark (BSFA), Bill Karp (NMFS/AFSC), Doug DeMaster (NMFS/AFSC).

The agenda (attached) was agreed upon for the meeting.

Dani Evenson provided an overview of Western Alaska chum and Chinook stock status. These powerpoint presentations are available at:
http://fakr.noaa.gov/npfmc/current_issues/bycatch/DecMtg/WAKchum.pdf,
http://fakr.noaa.gov/npfmc/current_issues/bycatch/DecMtg/WAKchinook.pdf
Committee members questioned whether total runs could be compared against total bycatch for estimation of relative impacts. Dani noted that this comparison is problematic as these estimates are not available for all river systems. Questions were posed regarding the age classes of chum returning to natal streams. She noted that 4 to 5 year old fish dominate the runs, with an every-other year switching between the predominance of these age-classes. 3 and 6 year old however also contribute to the runs despite the dominance of either 4 year olds or 5 year olds in each year.

Committee members requested clarification on differences between projected returns early in October and reported returns later in the month. Dani reviewed the issued and noted that the Pilot Station sonar had difficulties enumerating fish until the third week of June due to high water and silt. Hence, it would be difficult to estimate a total run from Pilot Station. The Eagle station sonar was more accurate for estimating the Canadian portion of the stock. Total run can also be estimated by adding passage at Eagle sonar and harvests downstream and applying the proportion of Canadian origin fish to expand out to the whole system.

Poor returns of Chinook were not limited to western Alaska as other areas of the state also experienced poor returns this past year. Robin Samuelson requested that future update report for Bristol Bay should include rivers in addition to the Nushagak. He noted that despite good returns to the Nushagak there are many rivers in Bristol Bay that have experienced poor Chinook returns. Committee members requested that consistency in reporting status and averages across areas would be helpful in comparing stock status. Dani noted that while desirable this is not possible given the disparity of information available and length of time series by region. Eric Olsen requested that a similar presentation on chum stock status be presented in conjunction with the Council review of the staff discussion paper at the December Council meeting.

Jeff Guyon provided an overview of progress towards genetically delineating chum stock of origin. This powerpoint is available at:
http://fakr.noaa.gov/npfmc/current_issues/bycatch/DecMtg/GuyonNPFMC_stockcomposition.pdf
He also provided an overview of a proposal to examine the homogeneity in stock of origin within hauls for Chinook. While progress continues toward this end, information is currently unavailable at present for determination of chum to stock of origin in groundfish bycatch. However, while updated studies have not yet been completed, information on aggregate region of origin (e.g., western Alaskan aggregates, Asian component, etc) could be done on recent bycatch samples. Currently the most recent published studies (as noted in the section of the staff discussion paper) date back to bycatch from the 1990s.

Committee members questioned to what extent genetic baselines are proprietary by the researchers who developed them. Jeff indicated that while researchers are generally willing to make them available for analyses, distribution of these databases is usually after they have been published. Public availability of both the genetic baselines and genotypes from the salmon bycatch are important for data transparency and for the full acceptance of future results.

A discussion was held of the availability of updated information on region of origin for use in the analysis of impacts of any bycatch management measures. Doug DeMaster indicated that the current schedule has results from the 1988-2005 chum bycatch being made available in 2011, although preliminary results for some year(s) could possibly be made sooner should the Council indicate that this was a priority. Committee members indicated that this was, in fact, a priority and the Council should alert NMFS to that effect.

Diana Stram reviewed the staff discussion paper which provided information on chum bycatch in the EBS pollock fishery, summary of published reports on chum stock of origin, hatchery information around the Pacific Rim and the current suite of alternatives modified by the Council in June 2009.

Suggestions for further inclusion and/or clarification in the paper include the following (note actual motion on revising alternatives is contained in the "Committee Recommendations" section and not included here):

- Repeat Table 11 for individual years to look at persistence of patterns
- Separate discussion of annual reporting requirements from data collection requirements
- Clarification on the ability of management to enforce or reopen closure based upon threshold allocation levels
- Clarification on the distinction between the affect of a rollover on a triggered closure and a post-delivery transfer option
- Include information on carrying capacity in the North Pacific
- Check for whether there are additional sources of information on Pacific Rim hatchery release estimates than just those from NPAFC
- Include hatchery returns as well as releases

- Clarification on the roll-over provision as it relates to a sector that has already reached its allocation. What is the outcome for cooperative rollovers (within CV cooperative rollovers?)? How to determine when a sector or cooperative has ceased fishing?
- Clarification on allocation to CDQ sector and group level (and that once allocated to the CDQ group it cannot then be reallocated otherwise)
- Additional information should be provided on Area M chum stock status and chum catch

Committee recommendations

1. **The Committee recommended that the Council write a letter to the Board of Fisheries to express concern over the bycatch of chum in the Area M fisheries.**
2. **The Committee passed the attached motion.** Note this motion passed 5-3. Discussion on specific aspects of the motion (and differences of opinion) are reflected below by topic of the motion.
    a. Cap levels: Committee members expressed arguments both for and against limiting the range of numbers for the hard cap. Those arguing against restricting this range noted that there is no analysis supporting restricting this range nor genetic information or indication of what role hatchery releases may have played in high bycatch years. Absent any analysis it was noted that lowering the high end of the range merely instigates a sector-level battle with no supporting justification for this. Committee members arguing for this range restriction noted that this was more consistent with recent bycatch averages and removed equally the lowest years of bycatch as with the highest years. Others noted that region of origin should not be a definitive consideration as the purpose of any action is to decrease overall bycatch regardless of whether it is Asian-origin or western Alaskan-origin fish. A lower number at the high end is more responsive to this notion. It was also noted that using the most recent data complies with the Council's general practices of using best available data.
    b. Closure configurations: The committee discussed difficulties with only the current closure configurations and timing option. Members noted that fixed closure dates are problematic, particularly pre-determined closure dated (i.e. with current closure August 1-31). Closures should be restructured to allow for individually triggered areas (discrete areas as moved with separate caps) as well as consideration of timing options which allow the opportunity to re-open an area based upon some criteria such that once closed it is not necessarily closed for the remainder of the fishing year. The committee requested that staff explicitly consider appropriate timing options for reopening all proposed closures based upon available data.
3. **Request that the Council consider some additional opportunities for input from rural Alaskan communities prior to finalizing alternatives for analysis.**
    a. Committee members noted that this type of recommendation was more appropriate coming to the Council from its Outreach committee which will be meeting on November 20th. Members further noted that scoping was done on this forthcoming analysis and that people should be directed to the scoping document that summarizing input from the public on the range of alternatives. Note this document is available on the Council website at: [insert link from June meeting document].

The meeting adjourned at 2:50 pm.

Salmon Bycatch Workgroup motion 10/29/09 for modification to proposed chum salmon bycatch alternatives
(changes from original alternatives in strike-out for deletions and underline for additions)

Alternative 1 – Status Quo

Alternative 1 retains the current program of the Chum Salmon Savings Area (SSA) closures triggered by separate non-CDQ and CDQ caps with the fleet's exemption to these closures per regulations for Amendment 84 and as modified by the Amendment 91 Chinook bycatch action.

Alternative 2 – Hard Cap

Component 1: Hard Cap Formulation (with CDQ allocation of 10.7%)
Options:

i. 3 Year Average 2007-2009: 51,633
ii. 5 Year Average 1997-2001: 58,156
iii. 10 Year 1992-2001: 76,242
iv. 10 Year 2000-2009 drop high: 143,405
v. 10 Year 2000-2009: 199,524
vi. 10 Year 2000-2009 drop low: 219,979
vii. 5 Year 2005-2009: 233,844

For Analysis:

a) ~~58,000~~ 51,633
b) ~~206,000~~ 76,242
c) ~~353,000~~ 143,405
d) ~~488,000~~ 233,844

Component 2: Sector Allocation
Option (applies to all): use blend of cdq/cdq partner bycatch numbers for historical average calculations.

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
   1) Pro-rata to pollock AFA pollock sector allocation
   2) Historical average
      i. ~~2004-2006~~ 2007-2009
      ii. ~~2002-2006~~ 2005-2009
      iii. ~~1997-2006~~ 2000-2009
   3) Allocation based on 75% pro-rata and 25% historical
   4) Allocation based on 50% pro-rata and 50% historical
   5) Allocation based on 25% pro-rata and 75% historical
c) Allocate 10.7% to CDQ, remainder divided among other sectors

Component 3: Sector Transfer

a) No transfers or rollovers
b) Allow NMFS-approved transfers between sectors
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   1) 50%

2) 70%
3) 90%

c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Component 4: Cooperative Provision

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.
Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
1) 50%
2) 70%
3) 90%

b) Allow NMFS to roll-over unused bycatch allocation to inshore cooperatives that are still fishing

Alternative 3 – Trigger Closure

Component 1: Trigger Cap Formulation

a) ~~45,000~~ 30,000
e) ~~58,000~~ 51,633
f) ~~206,000~~ 76,242
g) ~~353,000~~ 143,405
h) ~~488,000~~ 233,844

Application of Trigger Caps

a) Apply trigger to all chum bycatch
~~b) Apply trigger to all chum bycatch in the CVOA~~
c) Apply trigger to all chum bycatch between specific dates

Component 2: Sector allocation

Option (applies to all): use blend of cdq/cdq partner bycatch numbers for historical average calculations.

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
1) Pro-rata to pollock AFA pollock sector allocation
2) Historical average
iv. ~~2004-2006~~ 2007-2009
v. ~~2002-2006~~ 2005-2009
vi. ~~1997-2006~~ 2000-2009
3) Allocation based on 75% pro-rata and 25% historical
4) Allocation based on 50% pro-rata and 50% historical
5) Allocation based on 25% pro-rata and 75% historical
c) Allocate 10.7% to CDQ, remainder divided among other sectors

Component 3: Sector Transfer

a) No transfers or rollovers

b) Allow NMFS-approved transfers between sectors
   Suboption: Limit transfers to the following percentage of salmon that is available to the
   transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing
   Suboption: Limit transfers to the following percentage of salmon that is available to the
   transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

Component 4: Cooperative Provisions

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.
   Suboption: Limit transfers to the following percentage of salmon that is available to the
   transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

b) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Component 5: Area Option

a) Area identified in October, 2008 discussion paper
b) Existing Chum Salmon Savings Area (differs from status quo with application of other components)
c) New areas [to be identified by staff] which are small, discrete closure areas, each with its own separate cap whereby bycatch in that area only accrues towards the cap.

Component 6: Timing Option – Dates of Area Closure

~~a) Existing closure dates (August 1 – August 31 and September 1 through October 14 if trigger is reached.)~~

b) New closure dates

Component 7: Rolling Hot Spot (RHS) Exemption – Similar to status quo, participants in a vessel-level (platform level for Mothership fleet) RHS would be exempt from regulatory triggered closure(s).

a) Sub-option: RHS regulations would contain an ICA provision that the regulatory trigger closure (as adopted in Component 5) apply to participants that do not maintain a certain level of rate-based chum salmon bycatch performance.

NPFMC Salmon Bycatch Workgroup meeting
October 29, 2009
Clarion Suites Downtown (formally Hawthorn Suites),
1110 West 8th Avenue, Ballroom B, Anchorage, AK.
Draft Agenda 10/13/09

9:00am -5:00pm	
9:00 am	Welcome and Introductions
9:15am	Review meeting objectives
9:30am	Overview of chum salmon stock status Western Alaska: *Dani Evenson ADF&G*
10:15 am	Overview of chum bycatch stock of origin (and on-going progress for evaluation of trawl samples), update on Chinook bycatch stock of origin sample evaluation: *Jeff Guyon, AFSC-ABL*
11:15 am	Overview of staff discussion paper: *Diana Stram-NPFMC*
12:30pm -1:30pm	*LUNCH*
1:30pm-5:00pm	Committee discussions and recommendations

STATE OF ALASKA

SEAN PARNELL, GOVERNOR

DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99518-1599
PHONE: (907) 267-2105
FAX: (907) 267-2442

MEMORANDUM

TO: John Hilsinger
Director
Division of Commercial Fisheries

FROM: Dani Evenson, Dan Bergstrom, Doug Molyneaux, Bonnie Borba, Jeff Estensen, and Jim Menard – AYK Region
Tim Baker – Central Region

DATE: October 22, 2009

SUBJECT: 2009 Chum Salmon Stock Status, Western Alaska

Western Alaska Chum Salmon Stock Status 2009

Western Alaska includes Bristol Bay, Kuskokwim, Yukon, Norton Sound, and Kotzebue Sound management areas. Nushagak, Kuskokwim, Yukon, Unalakleet, and Kobuk rivers make up the chum salmon index stocks for this region along with Kuskokwim Bay, Nome Subdistrict, and Moses Point and Golovin subdistricts aggregate stocks.

In general, western Alaska chum salmon stocks declined sharply in 1998 through 2002, rebuilt rapidly beginning in 2003 with record and near record runs in 2005 and 2006, and have shown a general decline again since 2007. Chum salmon run abundance was variable among western Alaska rivers in 2009 with no clear geographic pattern. Most stocks exhibited average abundance with three notable exceptions: the strongest run occurred in the Nushagak River and the weakest runs occurred in northern Norton Sound and Yukon River fall chum salmon runs. Northern Norton Sound 2009 chum salmon runs were some of the poorest on record. More

southerly stocks in Kuskokwim Bay and Nushagak rivers showed stronger runs in 2008 and 2009, yet the most northerly stocks in Noatak and Kobuk rivers were also slightly above average.

Commercial fisheries occurred in most areas of western Alaska in 2009 with the exception of northern Norton Sound. Sport and personal use fisheries were restricted in the Yukon River (fall chum salmon run) and in northern Norton Sound rivers. More significantly, subsistence fisheries in both of these areas were restricted or closed for a portion of the season. Despite conservative management, many of the escapement goals in northern Norton Sound were not met. However, most escapement goals were met in other areas of western Alaska, but in some cases, such as with Yukon River fall chum salmon, at a cost to the people who rely on the resource for food and income.

The table below summarizes western Alaska chum salmon stock status for 2009 by area. A more detailed description of the stock assessment and discussion of recent fisheries management for each of the index stocks are presented following the summary table.

Table 1. – Overview of western Alaskan chum salmon stock performance, 2009.

Chum salmon stock	Total run size?	Escapement goals met?	Subsistence fishery?	Commercial fishery?	Sport fishery?	Stock of concern?
Bristol Bay	Above average	Yes	Yes	Yes	Yes	No
Kuskokwim Bay	Average	Yes	Yes	Yes	Yes	No
Kuskokwim River	Average	Yes	Yes	Limited	Yes	No
Yukon River summer run	Below Average	Some	Yes	Yes, but limited by low Chinook	Yes	No
Yukon River fall run	Poor	Most	Restrictions	Limited early season	Yes	No
Eastern Norton Sound	Average	N/A	Yes	Yes	Yes	No
Northern Norton Sound	Poor	None	Restrictions and closures	No	No	Yield concern (since 2000)
Kotzebue	Average	Yes	Yes	Yes	Yes	No

The Alaska Board of Fisheries (board) designated several western Alaska stocks as a "Yield Concern" or "Management Concern" in September 2000 (Table 2). A "Yield concern" means a concern arising from a chronic inability, despite the use of specific management measures, to

maintain expected yields, or harvestable surpluses, above a stock's escapement needs. "Management concern" means a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the sustainable escapement goal (SEG), biological escapement goal (BEG), optimal escapement goal (OEG), or other specified management objectives for the fishery, and is more severe than a "Yield concern". Subsequently in 2004 and 2007, based on improved abundance, the board lifted these designations from all but Norton Sound Subdistrict 1, 2, and 3 stocks; the Alaska Department of Fish and Game (department) has recommended that these designations for Norton Sound Subdistricts 1, 2, and 3 continue through the 2010 board cycle.

Table 2. – Western Alaska chum salmon stocks of concern designations and recommendations

Area/Stock	Salmon Species	Level of Concern			
		September 2000	January 2004	February 2007 (Current Status)	October 2009 Recommendation
Norton Sound Area					
Subdistrict 1	Chum	Management	Management	Changed to Yield	Continue
Subdistricts 2 and 3	Chum	Yield	Yield	Yield	Continue
Yukon River Area					
Yukon River	Summer Chum	Management	Management	Discontinued	
Yukon River	Fall Chum	Yield	Yield	Discontinued	
Toklat River	Fall Chum	Management	Discontinued		
Fishing Branch River	Fall Chum	Management	Discontinued		
Kuskokwim River Area					
Kuskokwim River	Chum	Yield	Yield	Discontinued	

Stock: Nushagak River chum salmon

Area: Bristol Bay

BOF Classification: none

The 2009 total run of chum salmon to Nushagak River was 1,213,821. The total run was 421,878 (53%) more than the recent 20-year (1989-2008) average of 791,943 and 28% more than the recent 10-year (1999-2008) average of 947,042 (Figure 1).

Spawning escapement in Nushagak River was 438,481 chum salmon which was above the SEG threshold of 190,000. A total of 775,340 chum salmon were harvested in the commercial fishery of Nushagak District. It is assumed that these chum salmon are bound for Nushagak River as this is the only river with a significant chum salmon population within the district. The 2009 commercial harvest of chum salmon was 61% higher than the 20-year average of 481,481 and 31% higher than the 10-year average of 591,806. The exploitation rate in 2009 was 64%, which was 5% higher than both the 10-year and 20-year averages. Commercial harvest in 2009 was one of largest harvests of chum salmon in the Nushagak District since 1966; only harvests in 2005, 2006 and 2007 have been larger.

The 2009 age composition of the total run was 2% (19,082) age-0.2, 61% (736,745) age-0.3, 37% (453,785) age-0.4, and <1% (4,208) age-0.5%.

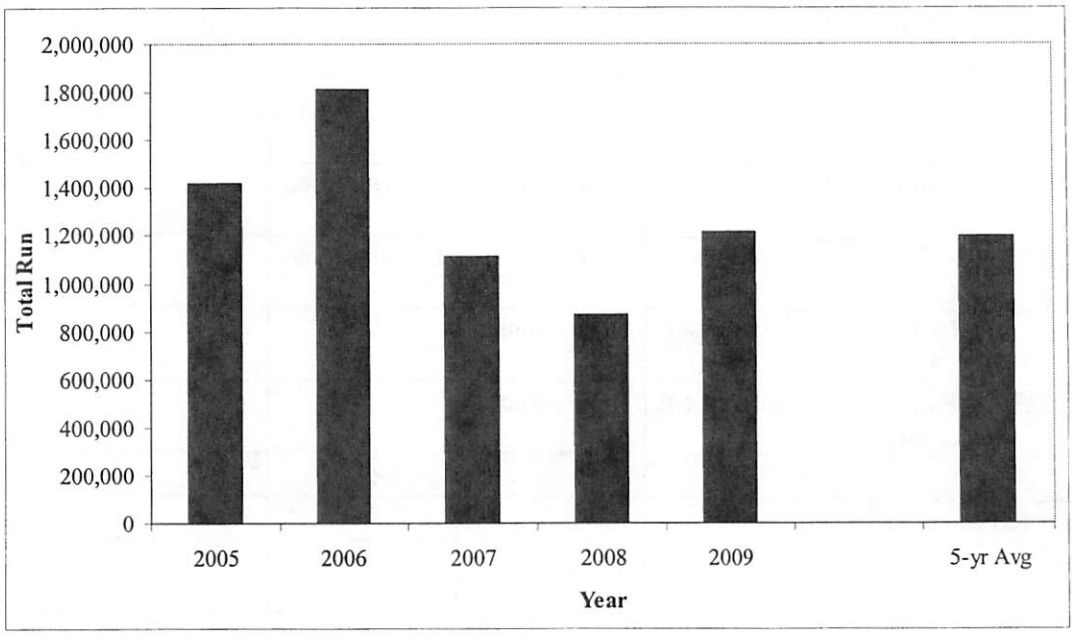


Figure 1. – Total chum salmon run, Nushagak River, 2005-2009 with 5-year average. 2009 data are preliminary.

Stock: Kuskokwim Bay chum salmon

Area: Kuskokwim

BOF Classification: none

District 5 (Goodnews Bay)

Chum salmon abundance in 2009 was expected to be below average and comparable to 2008. Although commercial catch rates and harvests were average to above average throughout the season, the run was lower than in 2008. Chum salmon run timing was characterized as normal. Preliminary chum salmon escapement at the Middle Fork Goodnews River weir of 19,713 fish was above the established SEG threshold of 12,000 fish (Figure 2), but 52% below the most recent 5-year (2004-2008) average of 41,398 fish. Subsistence harvest needs were likely met in 2009. The preliminary commercial harvest of chum salmon in District 5 of 16,985 fish is 55% above the recent 5-year (2004-2008) average of 7,703 fish and 38% above the historical average (1981-2008) of 12,324 fish (Figure 3).

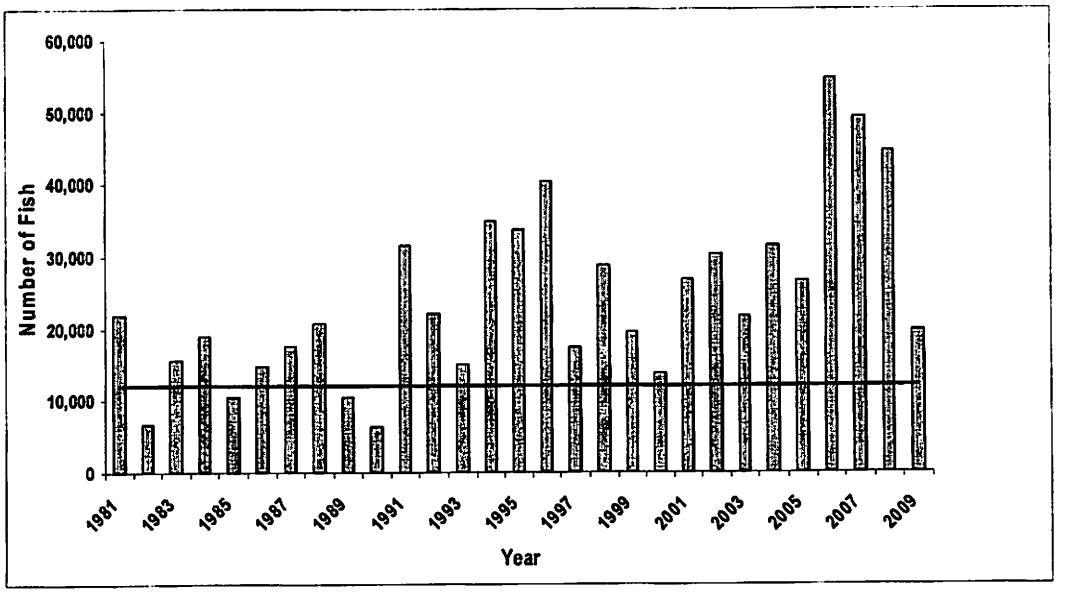


Figure 2. – Historical chum salmon escapement at the Middlefork Goodnews River weir. 1981-2009. Solid black horizontal line shows the SEG point of 12,000 fish.

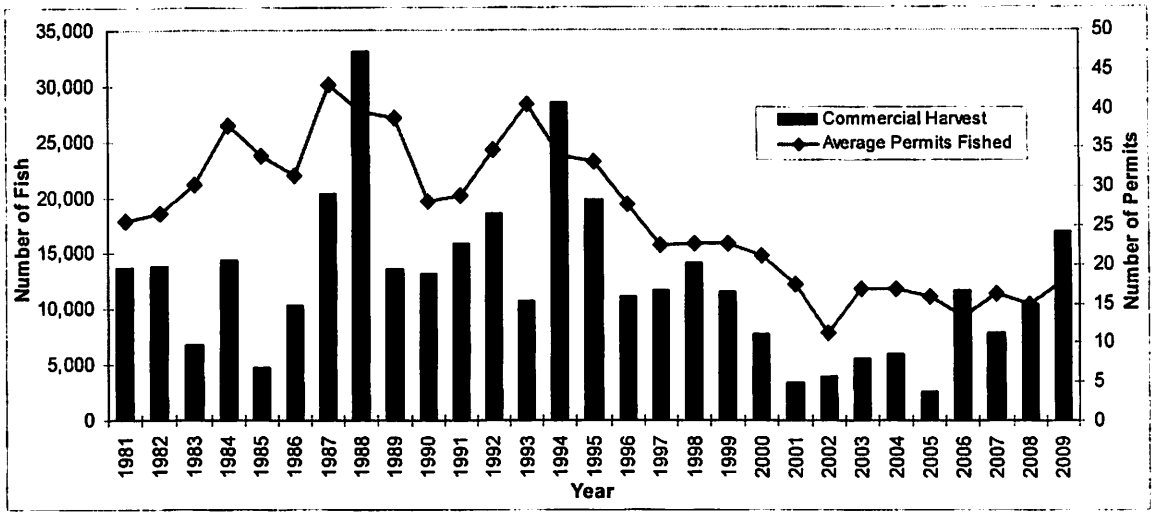


Figure 3. – Historical commercial chum salmon harvest, and average number of permits participating in each opening, District 5, 1981-2009.

District 4 (Quinhagak)

Commercial catch rates and harvests were average to above average throughout the season and the run was larger than in 2008. Preliminary chum salmon escapement at the Kanektok River weir was 51,647 fish. There is no formal escapement goal for chum salmon at the Kanektok River weir and comparison of escapement among years is problematic because of the variation in the operational starting date of the weir. A formal chum salmon threshold escapement goal for aerial survey has been established for Kanektok River (SEG point > 5,200 fish), however no surveys have been flown since 2004. Preliminary District 4 commercial harvest of chum salmon of 91,232 fish (Figure 4) was the highest on record and 39% above the historical average (1981-2008) of 55,435 fish.

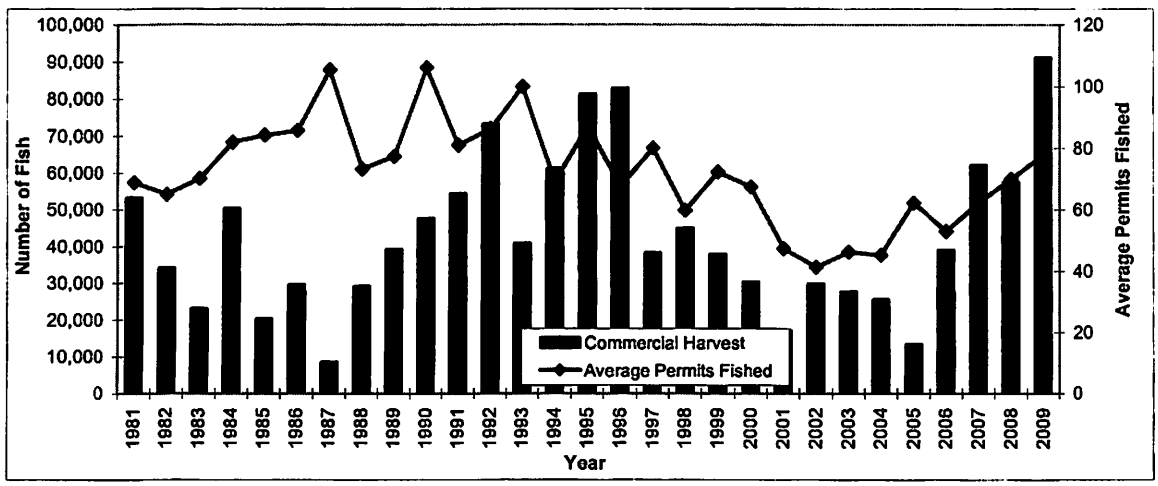


Figure 4. – Historical commercial chum salmon harvest, and average number of permits participating in each opening, District 4, 1981-2009.

Stock: Kuskokwim River chum salmon

Area: Kuskokwim

BOF Classification: none

Kuskokwim River chum salmon were listed by the board as a stock of yield concern in September 2000 based on low run abundance in 1997-2000, but markedly improved abundance led to the finding being lifted in January 2007. Near record runs occurred from 2005 through 2007. Thereafter, abundance has been near average as illustrated in Figure 3, which shows results of a retrospective run reconstruction that is a conservative approximation of historical chum salmon abundance (Bue et al. 2008). The model used in the run reconstruction is limited by the lack of years with reliable total chum salmon abundance estimates needed for scaling; still, this model is thought to better approximate actual abundance than previous models (e.g., Shotwell and Adkison 2004) that had fewer datasets available. This run reconstruction was not available at the time of deliberations related to the setting and lifting of the stock of concern finding. Subsistence harvest estimates are not yet available for 2007 through 2009, so values for those years are based on the 5-year average harvest.

Chum salmon abundance in 2009 was expected to be comparable to 2008, and that appeared to be the case (Figure 5). Preliminary assessment is that the 2009 subsistence harvest needs were met and a modest commercial harvest of 76,862 chum salmon was taken, which is the largest harvest since 1998. Commercial harvest continues to be constrained by low market interest in chum salmon. Escapements in the two largest chum salmon producing sub-basins were within the SEG range and comparable to 2008 (Aniak sub-basin), or well above the SEG range and twice the 2008 escapement (Kogrukluk River in the Holitna River sub-basin). Elsewhere escapements were variable relative to 2008 in monitored tributaries that do not have escapement goals. Overall chum salmon exploitation rate in 2009 is estimated to have been near 12%, compared to the 10-year average of 9%.

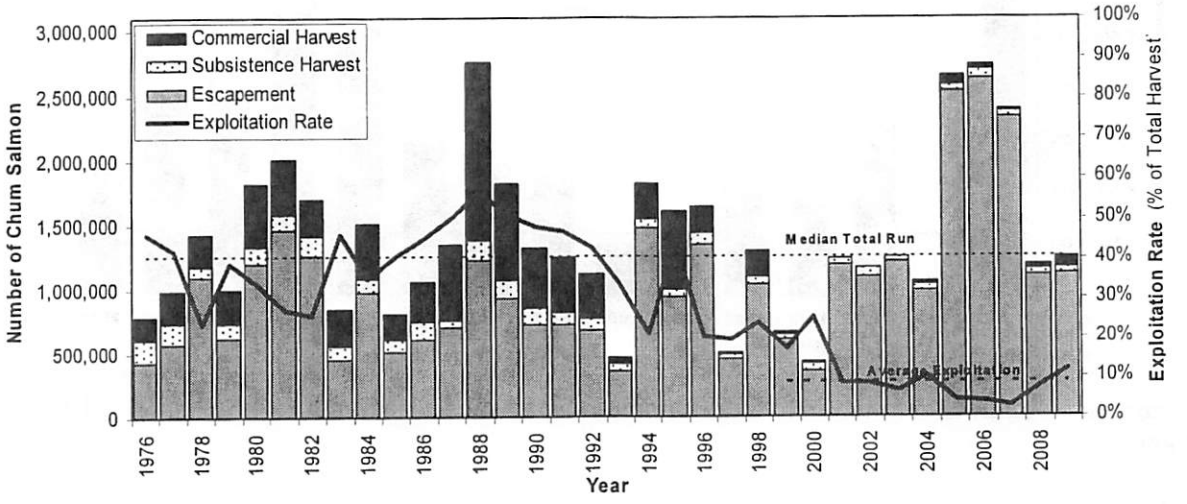


Figure 5.– Historical Kuskokwim River chum salmon run reconstruction and harvest exploitation rate.

Stock: Yukon River summer chum salmon

Area: Yukon River

BOF Classification: None

The 2009 total run of approximately 1.4 million summer chum salmon was sufficient to support directed fisheries including commercial, subsistence and personal use harvests as well as meeting most of the escapement goals. The 2009 run was approximately 43% below the recent 5-year (2004-2008) average of 2.4 million chum salmon and 24% below the 10-year (1999-2008) average of 1.8 million. Note that poor runs occurred in 1999-2002, and large runs occurred in 2005-2007 (Figure 6). The 2009 run was expected to be near average and similar to the previous years run of approximately 1.9 million. The run was anticipated to provide for escapements, support a normal subsistence harvest, as well as personal use and a commercial harvest between 500,000 and 900,000. However, due to the concerns for a poor Chinook salmon run fishing restrictions were in place most of the season with some opportunity for chum salmon harvests allowed based on timing of the two species and fisheries with gillnets restricted to 6 inch maximum mesh size. Approximately 170,000 summer chum salmon were harvested in the commercial fishery and incidental Chinook salmon were to be taken home for subsistence uses. Summer chum salmon escapements were well below average in the east Fork Andreafsky, Anvik, and Gisasa rivers but exceeded expectations in Henshaw Creek and were near average in Salcha River.

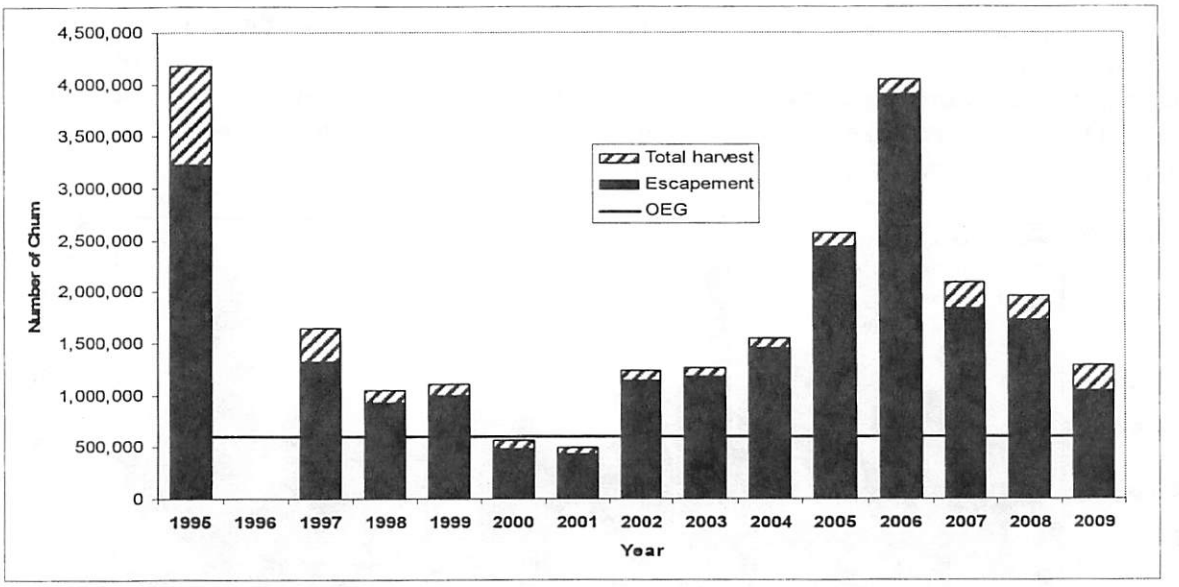


Figure 6. – Yukon River summer chum salmon escapement and harvest estimates, 1995, 1996-2009.

Table 3. – Yukon River escapement goals set for summer chum salmon in 2009.

Stream (project type)	Current Goal	Type of Goal	2009
East Fork Andreafsky River (weir)	65,000-130,000	BEG	8,800
Anvik River (sonar)	350,000-700,000	BEG	183,000

Stock: Yukon River fall chum salmon

Area: Yukon River

BOF Classification: None

The 2009 fall chum salmon run was approximately 61% below the recent 5-year (2004-2008) average of 1.2 million fall chum salmon and 45% below the 10-year (1999-2008) average of 819,000 (Figure 7). Note that both averages include the record run in 2005 and the 10-year average includes the worst run on record in 2000.

Management shifted to inseason assessment around August 8, the average midpoint of the run, with a poor showing of fall chum salmon indicating the run was possibly weaker yet than anticipated. Inseason, the fall chum run was comprised of three primary pulses, two small and one moderate sized, with a timing of two days late when compared to the average midpoint. The preliminary 2009 post season run size is estimated to be approximately 450,000 fall chum salmon. This is below the 1974-2008 average of all years and odd-numbered years of 876,000 and 687,000 fall chum salmon respectively.

A commercial fishery was conducted in districts 1 and 2 at the beginning of the run based on the preseason projection and at the end of the run in districts 1 and 6 based on availability of coho salmon. The total harvest was approximately 25,000 fall chum salmon which is 78% below the recent 5-year average of 114,000. Subsistence fishing time was reduced by approximately one third and personal use fisheries were closed for a portion of the run to assure escapement goals in the majority of the areas would be achieved. The subsistence harvest estimate is expected to be less than 75,000 fall chum salmon.

At this time, the preliminary run size estimate is 450,000 fall chum salmon with an estimated harvest of approximately 100,000 fish. This level of harvest resulted in an estimated escapement of approximately 350,000 fish, which is within the drainage-wide BEG range of 300,000 to 600,000 fall chum salmon (Table 4). It is assumed that the Chandalar and Tanana rivers escapement goals were met based on a combination of genetic mixed stock analysis (MSA) of Pilot Station sonar test fishery samples and the passage of adequate numbers to the Upper Yukon mainstem stocks and the Fishing Branch River. The minimum spawning escapement goals of 80,000 fall chum salmon for Canadian mainstem Yukon River and the interim escapement goal of 22,000 fall chum salmon for the Fishing Branch River were met. The Sheenjek River stock was once again one of the weakest stocks and did not meet the low end of the BEG.

Low water and problems with assessment of fall chum salmon at the main river sonar site in the lower river and early termination of the Chandalar River escapement project, which produces on average 29% of the fall chum salmon in the Yukon River drainage, made total run reconstruction difficult. Typically 30% of the stocks are of Canadian origin, 30% are U.S. stocks in the upper Yukon River (Chandalar and Sheenjek rivers) and 30% of the stocks are bound for the Tanana River. The U.S./Canada Yukon River Panel agreed to a Canadian Interim Management Escapement Goal (IMEG) of >80,000 fall chum salmon based on the Eagle sonar program. The preliminary estimated escapements provided by monitoring at the border minus Canadian harvests is slightly greater than 80,000 fall chum salmon and therefore above the minimum goal. Sheenjek River total passage was assessed at approximately 47,000 fall chum salmon however,

the goal is based on one bank operations which obtained 28,000 fish passage and so remains 44% below the low end of the BEG. Chandalar River was assessed based on a combination of genetics, aerial surveys, and relationship to border passage and resulted in an assessment of approximately 100,000, or exceeding the lower end of the BEG range by at least 7%. An overall Tanana River estimate of escapement was assessed based on genetics at approximately 100,000 or exceeding the lower end of the BEG range by at least 6%. Delta River cannot be assessed until the foot surveys are completed between October and December. Preliminary data indicates that the lower end of the goal would be made in Delta River as well.

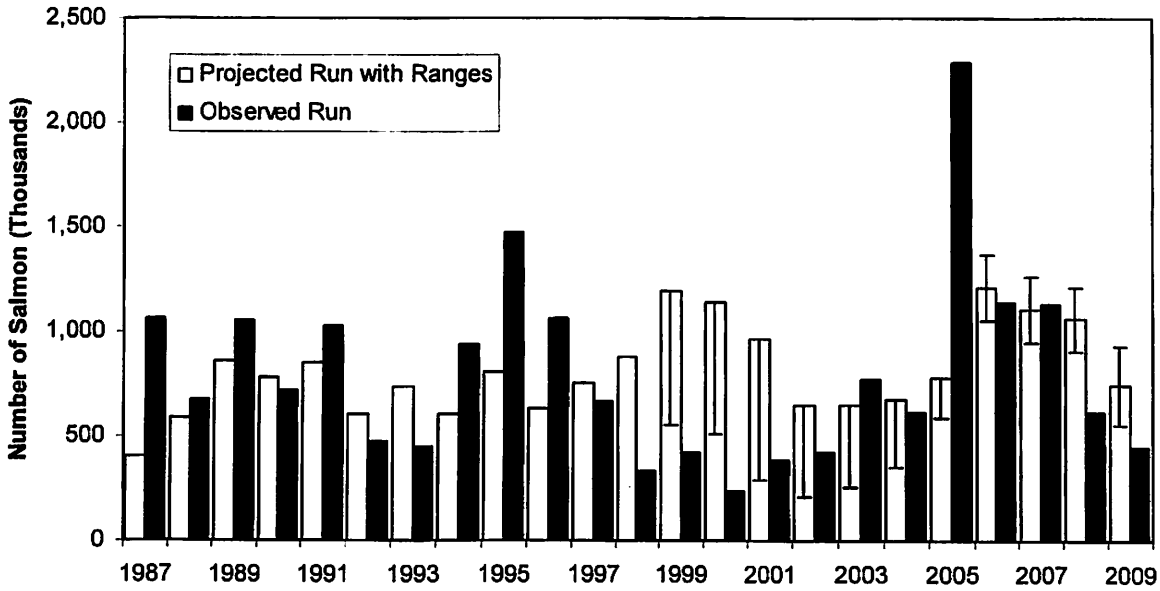


Figure 7. – Fall chum salmon observed versus expected total runs based on spawner recruit relationships, 1987-2008, Yukon Area. 2009 data are preliminary.

Table 4. – Yukon River escapement goals set for fall chum salmon compared to 2009 preliminary assessments of escapements.

Stream (project type)	Current Goal	Type of Goal	2009
Yukon Drainage (combination)	300,000–600,000	BEG	350,000
Tanana River (NA/genetics)	61,000–136,000	BEG	100,000
Delta River (replicate foot surveys)	6,000–13,000	BEG	[1]
UY Tributaries (combination)	152,000–312,000	BEG	172,000
Chandalar River (sonar/genetics)	74,000–152,000	BEG	100,000
Sheenjek River (sonar)	50,000–104,000	BEG	47,000
Canadian Upper Yukon River (sonar)	>80,000	(Yukon Salmon Agreement)	80,000
Canadian Fishing Branch River (weir)	22,000-49,000	IMEG[2]	25,000

[1]Goal cannot be evaluated at this time, preliminary data suggests the low end will be achieved.

[2]The US/Canada Yukon River Panel agreed to a three year (2008-2010) Canadian Interim Management Escapement Goal (IMEG) of 22,000-49,000 fall chum salmon based on the Bue and Hasbrouck (Unpublished) method applied to those years the weir was fully operational.

Stock: Norton Sound Subdistrict 1 (Nome) chum salmon

Area: Norton Sound

BOF Classification: Stock of Yield Concern

Chum salmon runs occur mainly in the Bonanza, Eldorado, Flambeau, Nome, Snake, Solomon and Sinuk rivers of the Subdistrict 1 (Nome). Nome Subdistrict has an aggregate BEG range from 23,000 to 35,000 chum salmon (Table 5). The 2009 chum salmon escapement for Nome Subdistrict was 21,300, below the lower range of the BEG and the third lowest on record since 1993 (Figure 8). Chum salmon escapements are monitored using aerial surveys on Bonanza, Flambeau, Sinuk, and Solomon rivers using an expansion method and escapement project counts on Eldorado, Nome, and Snake Rivers.

Chum salmon escapements are monitored using weirs on Eldorado, Nome, and Snake rivers. In 2009, none of the rivers monitored with weirs met escapement goals (Table 5). The 2009 Eldorado River chum salmon escapement was 4,943, about 80% of the lower end of the SEG (6,000 to 9,200), and was the fourth lowest on record. The 2009 Nome River chum salmon escapement was 1,565, about 46% of the lower end of the SEG (2,900 to 4,300) and the lowest on record besides 1999. The 2009 Snake River chum salmon escapement was 891, about 44% of the lower end of the SEG (1,600 to 2,500) and the lowest on record with the exception of 1999.

The 2009 chum salmon harvestable surplus was projected to exceed the amounts necessary for subsistence (ANS), but a near-record low early chum salmon run led to a closure of the subsistence fishery in mid July. Even though there was a late surge of chum salmon into the subdistrict, the escapement was still 7% below the lower end of the BEG.

Table 5 – Nome Subdistrict chum salmon escapement goals and escapement estimates, 2009.

Stream (project type)	Current Goal	Type of Goal	2009
Nome Subdistrict	23,000 - 35,000	BEG	21,300
Eldorado River (weir)	6,000 - 9,200	SEG	4,943
Nome River (weir)	2,900 - 4,300	SEG	1,565
Snake River (weir)	1,600 - 2,500	SEG	891

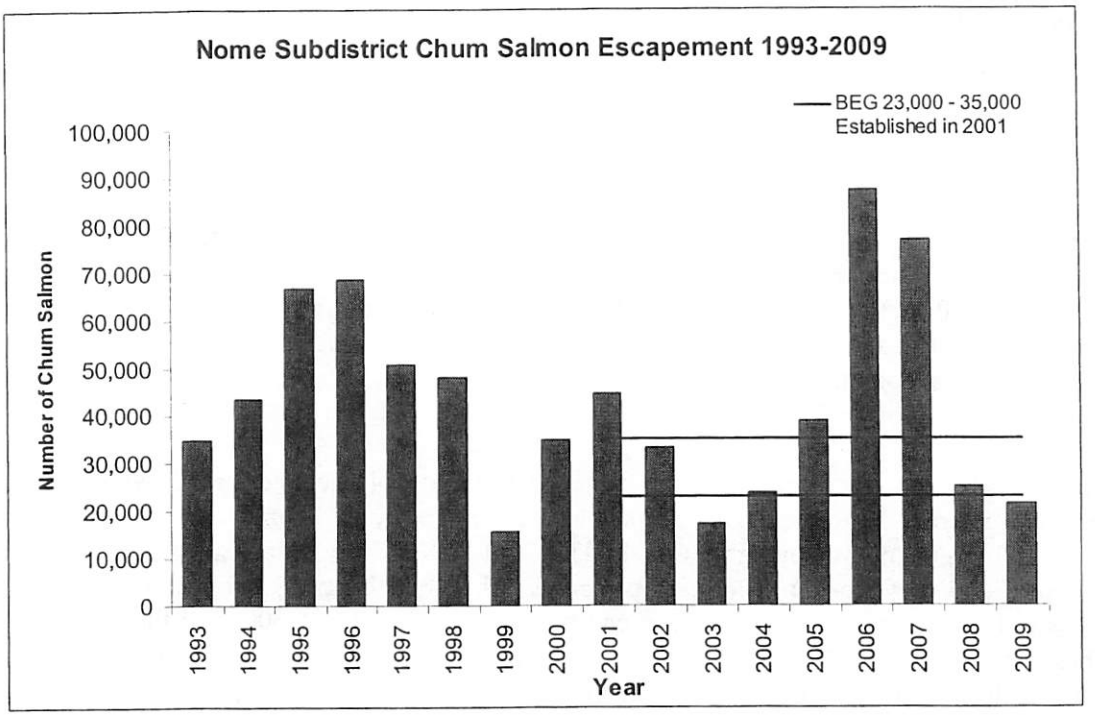


Figure 8 – Nome Subdistrict chum salmon escapement and BEG, 1993 to 2009.

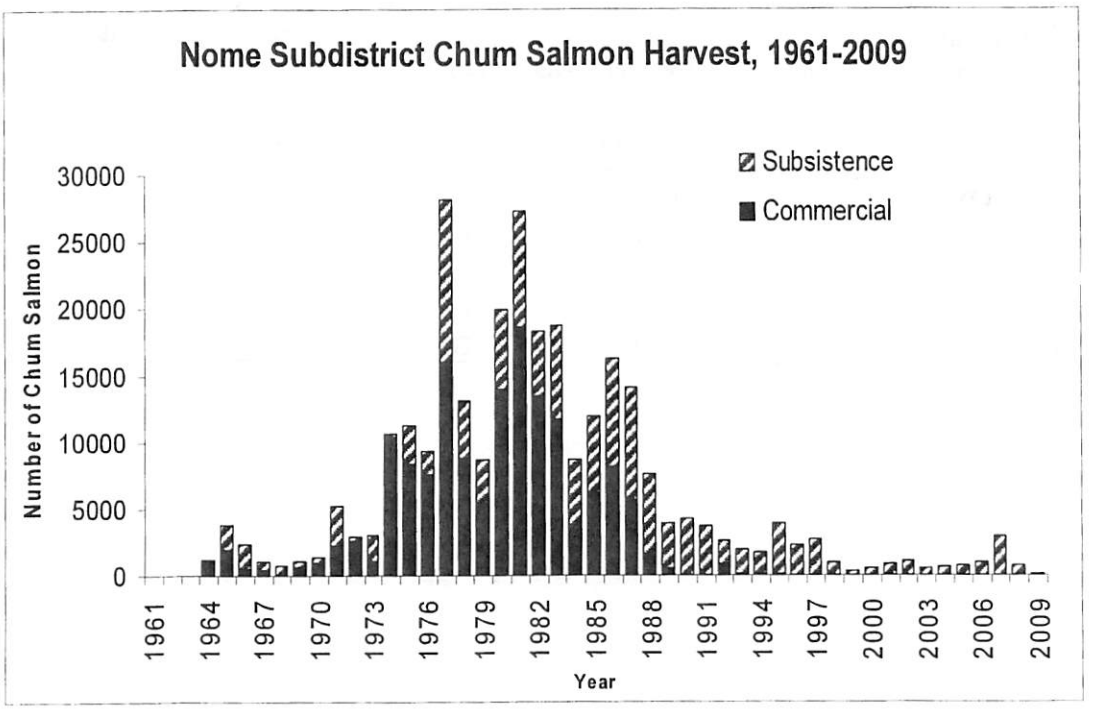


Figure 9. – Nome Subdistrict chum salmon commercial and subsistence harvest (1961-2009). Subsistence harvest data are unavailable for 2009.

Stock: Norton Sound Subdistricts 2 (Moses Point) and 3 (Golovin) chum salmon

Area: Norton Sound

BOF Classification: Stock of Yield Concern

Chum salmon runs occur mainly in the Fish River drainage in Subdistrict 2 (Golovin) and in Kwiniuk, Tubuktulik and Kwik rivers in Subdistrict 3 (Moses Point). In Subdistrict 2 (Golovin), chum salmon escapement is monitored on the Niukluk River using tower enumeration. Telemetry studies have shown that approximately one-third of the chum salmon that enter Fish River drainage spawn above the Niukluk River counting tower. In Subdistrict 3 (Moses Point) chum salmon escapement is monitored on Kwiniuk River using tower enumeration. Chum salmon escapements are not monitored on Tubuktulik or Kwik rivers.

Chum salmon escapements in 2009 were well below tower-based escapement goals in Niukluk (SEG >25,000) and Kwiniuk rivers (OEG 11,500-23,000). The 2009 Niukluk River chum salmon escapement was 15,879, about 60% of the SEG (Figure 10). The 2009 Kwiniuk River chum salmon escapement was 8,733, 75% of the lower end of the OEG range (Figure 11). As a consequence, pink and chum salmon directed commercial fishing was not allowed in accordance with the subdistricts 2 and 3 management plan. During the most recent 5-year period, subsistence fishing time has not been restricted (Figures 12 and 13). Exploitation rates on chum salmon are very low and restrictions on the subsistence fishery have shown to have little effect on achieving chum salmon escapement goals in subdistricts 2 and 3.

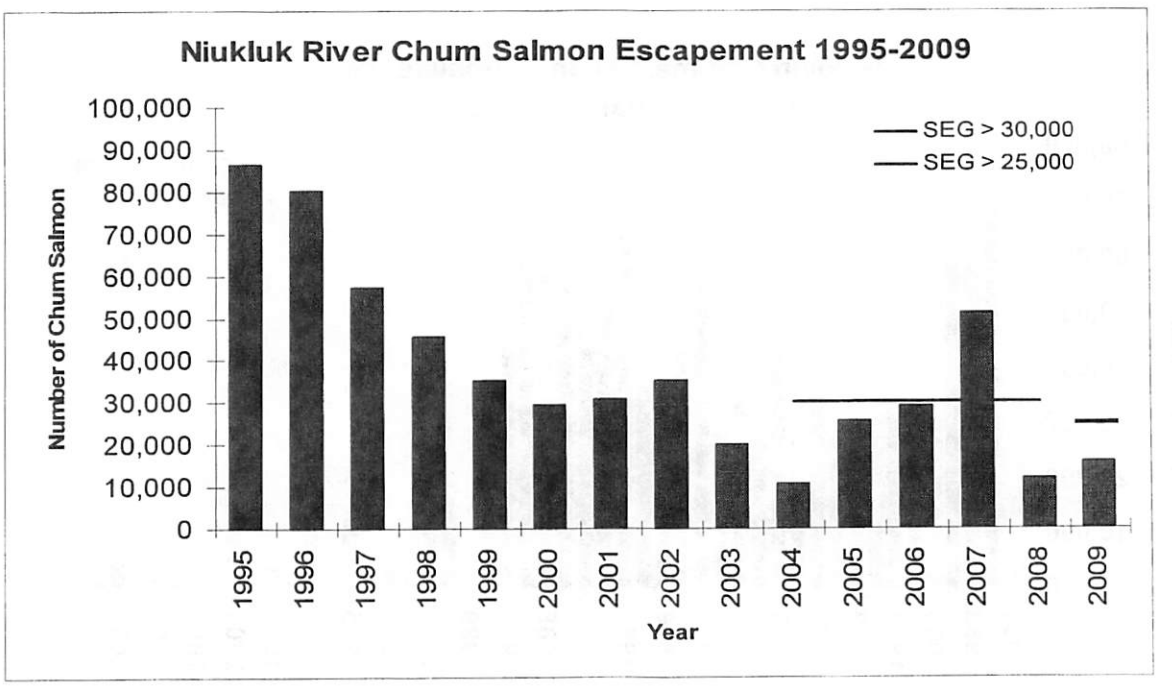


Figure 10. – Niukluk River escapement 1995-2009 and SEG 2004-2008, and 2009.

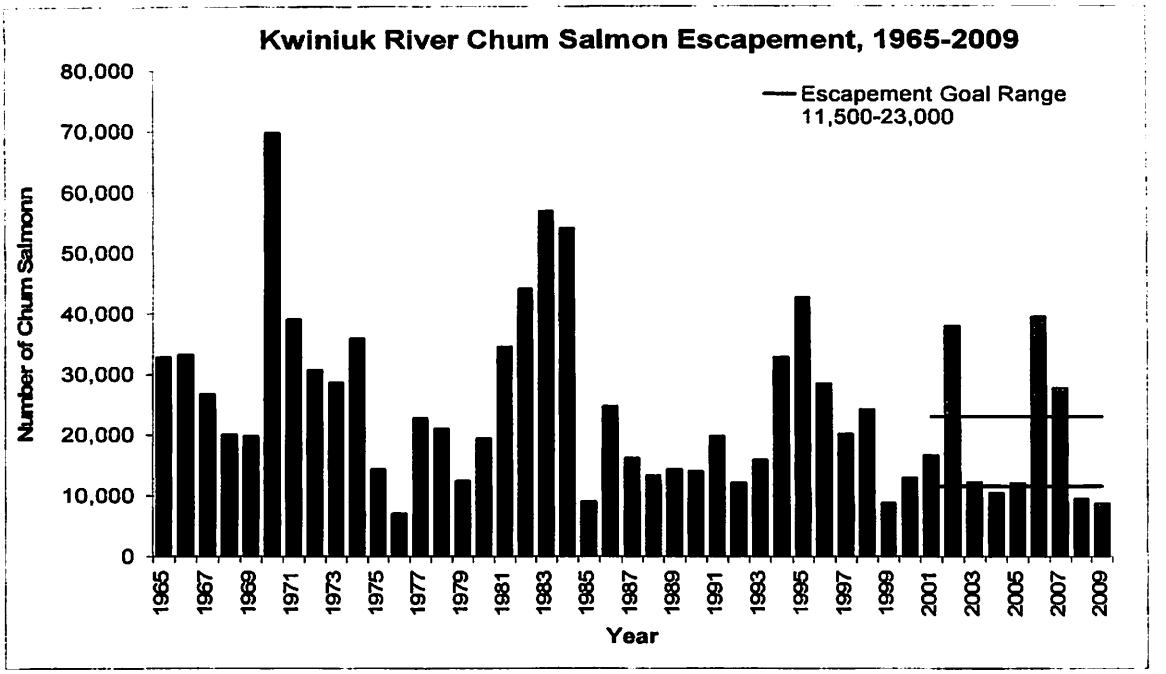


Figure 11. – Kwiniuk River chum salmon escapement, 1965-2009 and OEG range 1991-2009.

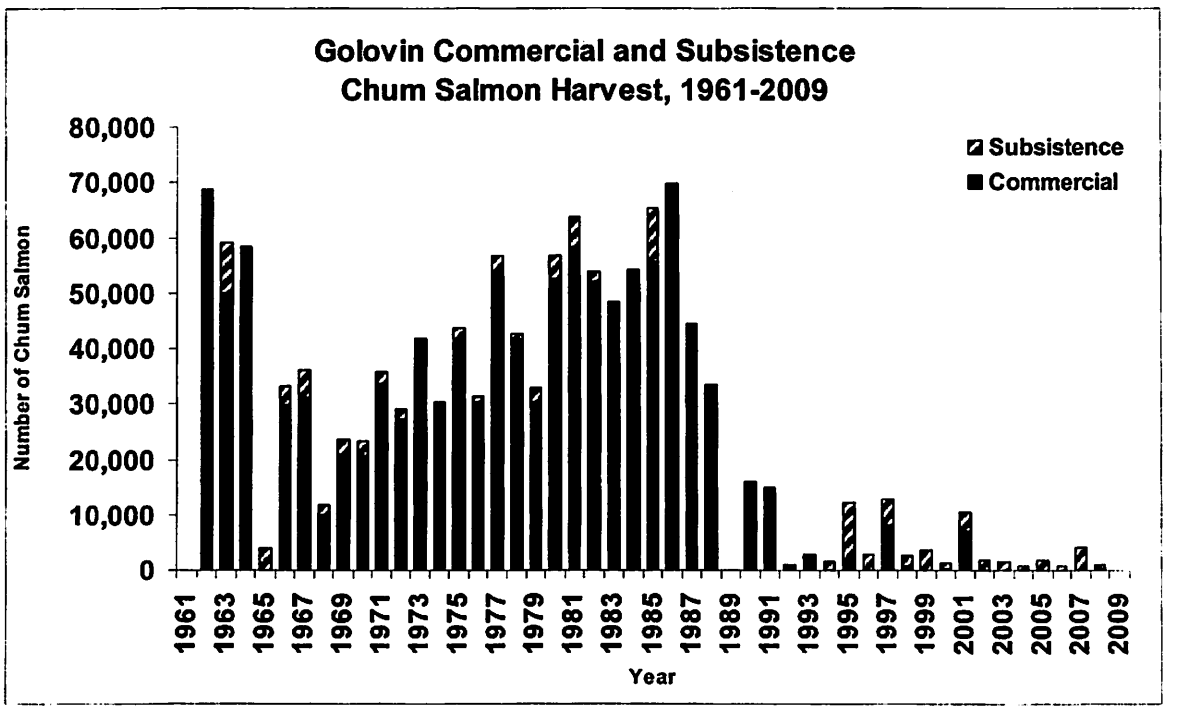


Figure 12. – Golovin Subdistrict chum salmon harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.

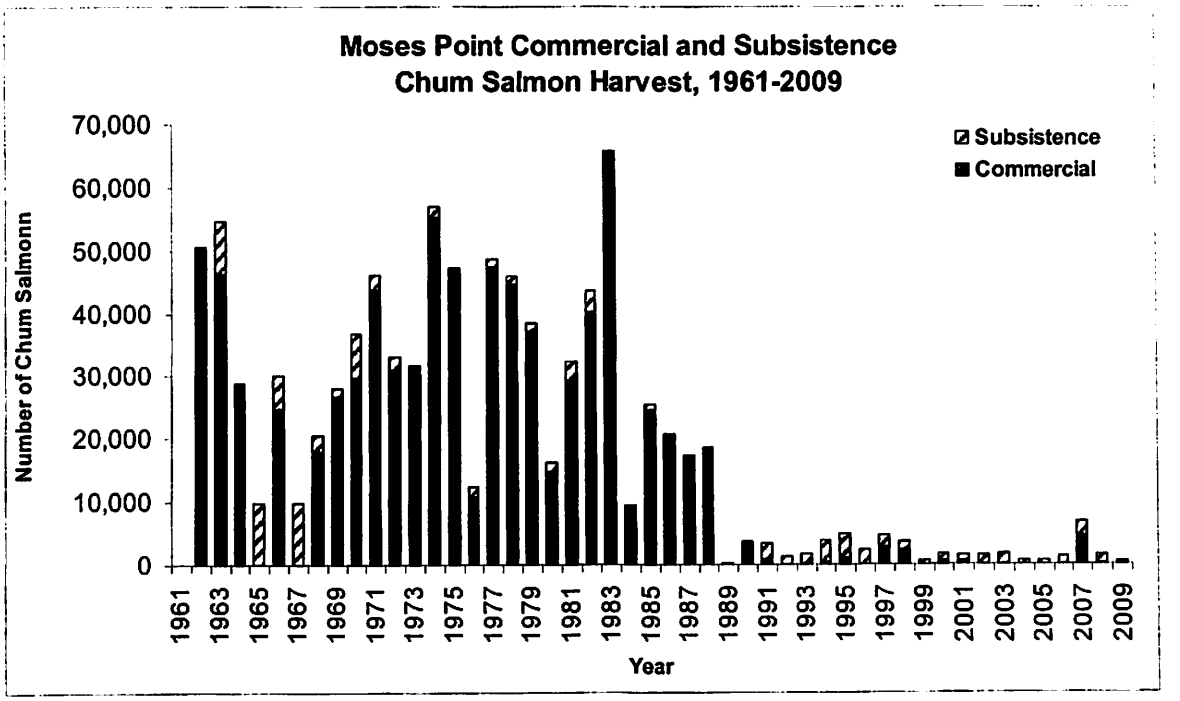


Figure 13. – Moses Point Subdistrict chum salmon harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.

Stock: Norton Sound Subdistrict 5 (Shaktoolik) chum salmon

Area: Norton Sound

BOF Classification: None

Chum salmon runs occur mainly in the Shaktoolik River. Chum salmon escapement is not monitored on the Shaktoolik River; hence, there is no escapement goal developed for this stock. Historically, most of the chum salmon are harvested in the commercial fishery in Subdistrict 5 (Shaktoolik Subdistrict) in the marine waters, few are caught in the subsistence fishery. In 2009, the commercial harvest was 10,915 chum salmon which is 68% above the recent 5-year (2004-2008) average of 3,520 fish (Figure 14).

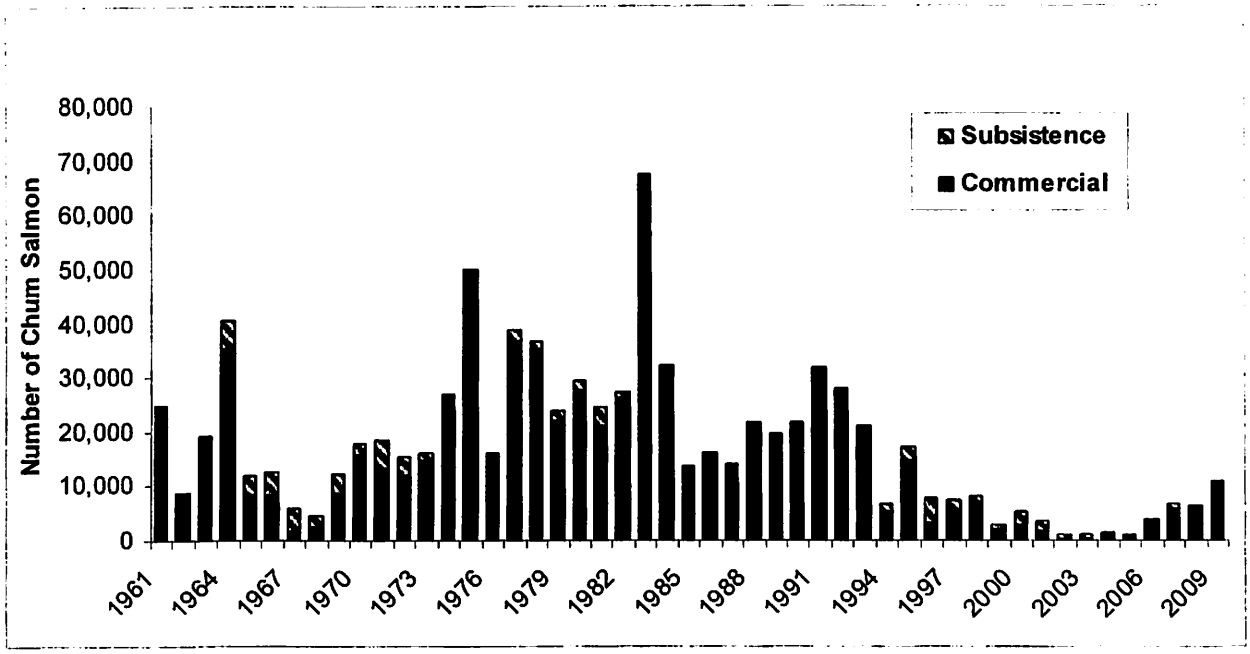


Figure 14. – Shaktoolik Subdistrict chum salmon commercial and subsistence harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.

Stock: Norton Sound Subdistrict 6 (Unalakleet) chum salmon

Area: Norton Sound

BOF Classification: None

Chum salmon runs occur mainly in the Unalakleet River drainage in Subdistrict 6 (Unalakleet). Chum salmon runs in Unalakleet River are monitored using a test net in Unalakleet River and with a counting tower on North River. Telemetry studies have shown that approximately thirteen percent of the chum salmon that enter the Unalakleet River drainage spawn above the North River counting tower (Estensen et al. 2005).

The 2009 expanded test net catch was 1,670 chum salmon which is above the average of 954 (1996 to 2008). The 2009 North River counting tower escapement estimate was 9,798 chum salmon, also above

the average of 7,395 (1996 to 2008) (Figure 15). Commercial harvest in 2009 was 20,006 chum salmon which is 56% above the most recent 5-year (2004-2008) average of 8,855 and 71% greater than the 10-year (1999-2008) average (Figure 16).

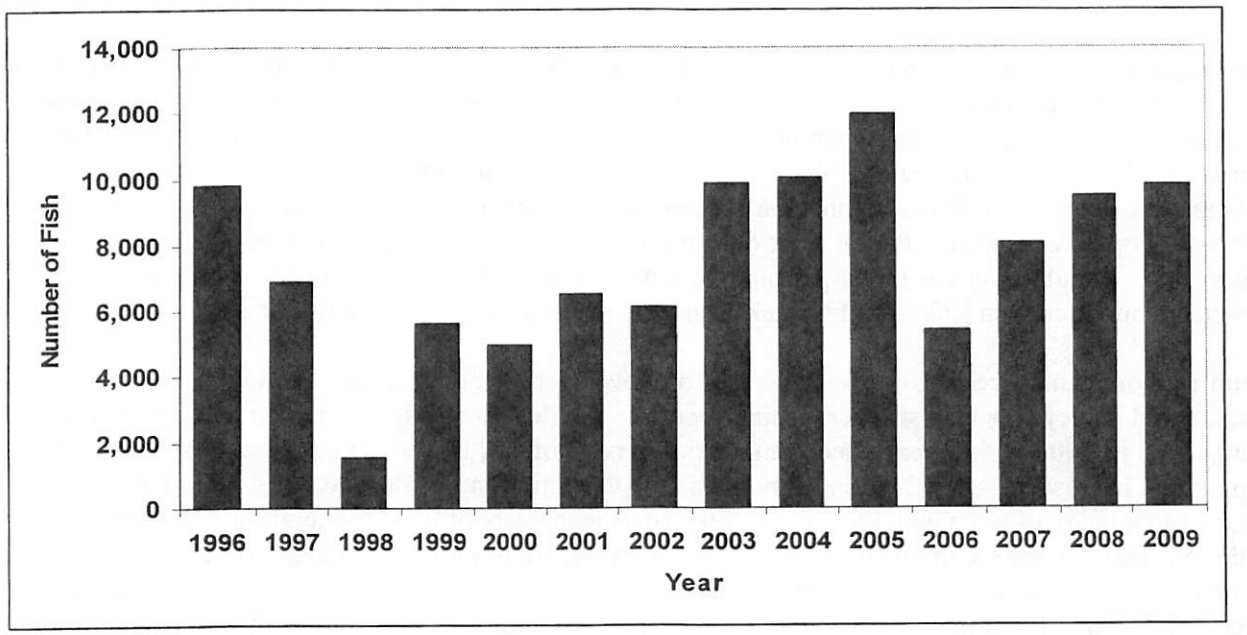


Figure 15. –North River counting tower chum salmon escapement estimates, 1996-2009.

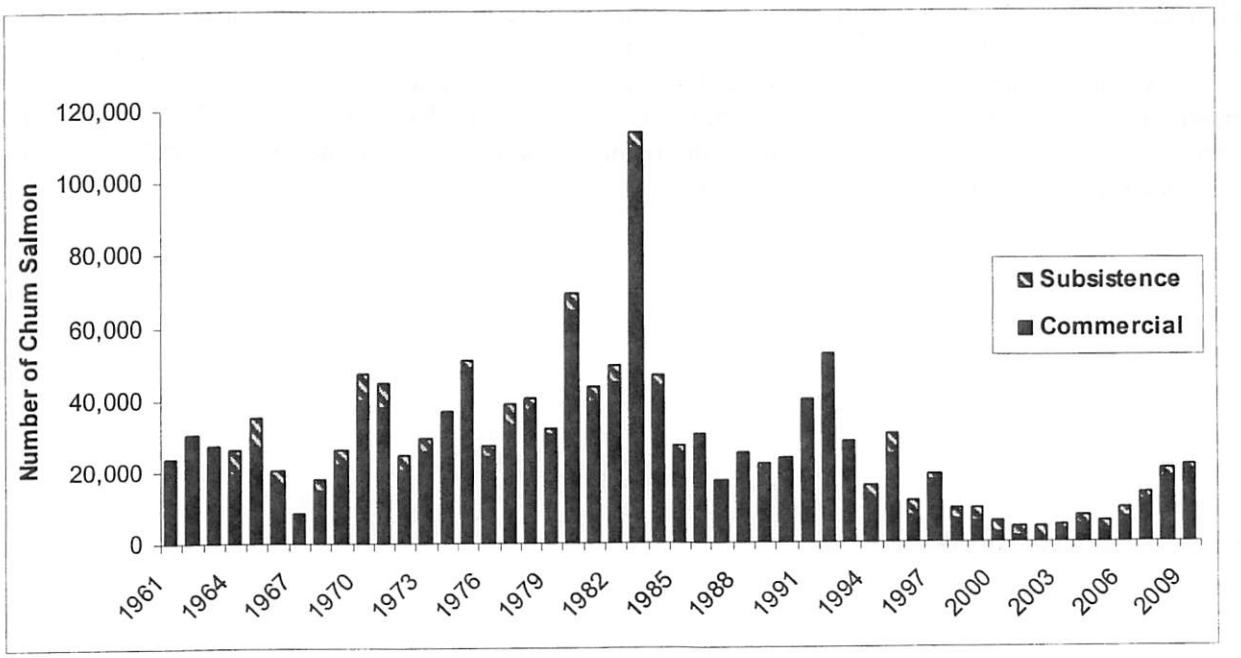


Figure 16. – Unalakleet Subdistrict chum salmon commercial and subsistence harvest, 1961-2009. Subsistence harvest data are unavailable for 2009.

Stock: Kobuk and Noatak chum salmon

Area: Kotzebue

BOF Classification: None

Two major rivers in the Kotzebue area, Kobuk River and Noatak River, have chum salmon runs that provide for a commercial and subsistence fishery in Kotzebue Sound and subsistence fisheries along their respective drainages. The department operates a test fishery project near the village of Kiana, approximately 75 miles upstream of the Kobuk River mouth. The project has been operational since 1993 and the department allows commercial fishing near Kotzebue to continue during the season if the drift test net project confirms that at least 600 index points for chum salmon catches will be reached (Figure 17). Kobuk River has the larger run of chum salmon of these two major river systems. Aerial surveys are infrequent on Kobuk and Noatak rivers and occur only every several years.

Chum salmon abundance in 2009 was average to above average based on commercial catch, test fish index, aerial surveys, and subsistence fishing reports. The department forecasted an average to above average run in 2009 with an expected commercial harvest of 150,000 to 200,000 chum salmon. The commercial harvest of 187,562 chum salmon was the third highest this decade. The Kobuk River test fishery catch index of 971 ranked tenth out of the seventeen years of project operation. Aerial surveys of the Noatak and Kobuk drainages were within or exceeded aerial survey range goals. The Noatak River index area count of 69,872 chum salmon was within the 42,000 to 91,000 aerial survey goal range. The Kobuk River index area count of 45,155 chum salmon was over double the upper end of the 9,700 to 21,000 aerial survey goal range. Subsistence fishermen on Kobuk and Noatak rivers reported good catches of chum salmon in 2009.

Beginning in 1996, the commercial buyers began limiting the harvest by having capacity limits. In 2002, the last buyer left the fishery and for two years a few permits holders fished and shipped their catch to Anchorage for processing. Since 2004 when one buyer returned, there has been a limited commercial fishery. Because of capacity limits of the buyer, the department opens the commercial fishery each year and lets the buyer determine the fishing periods. There are no time or catch limits on subsistence salmon fishing in the Kotzebue area.

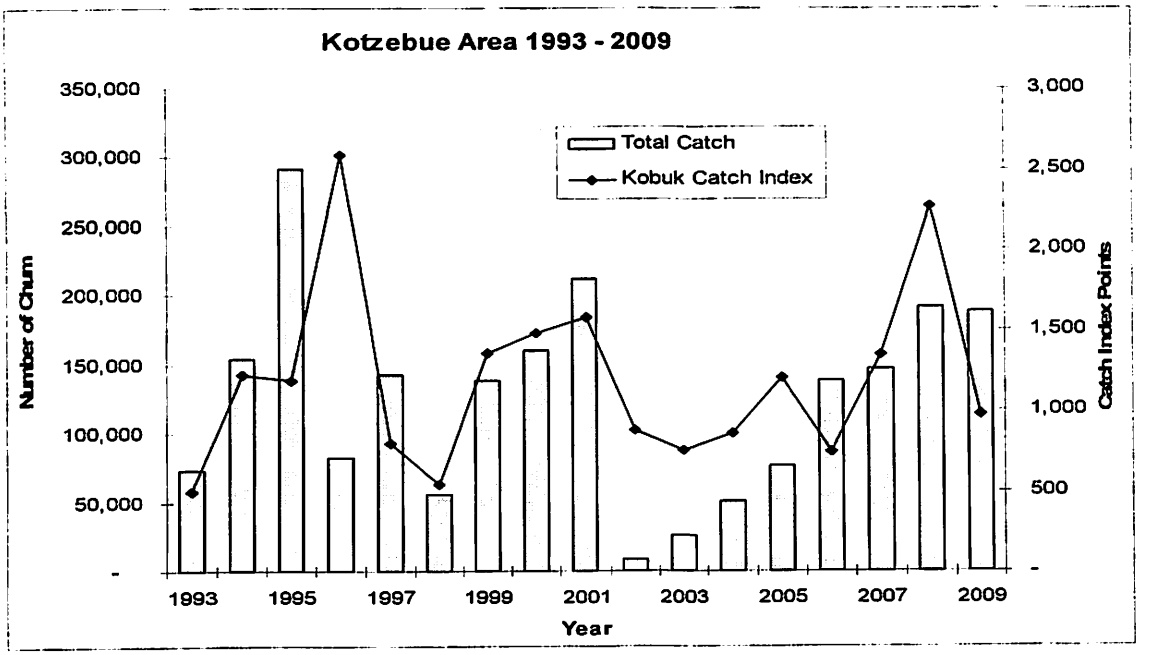
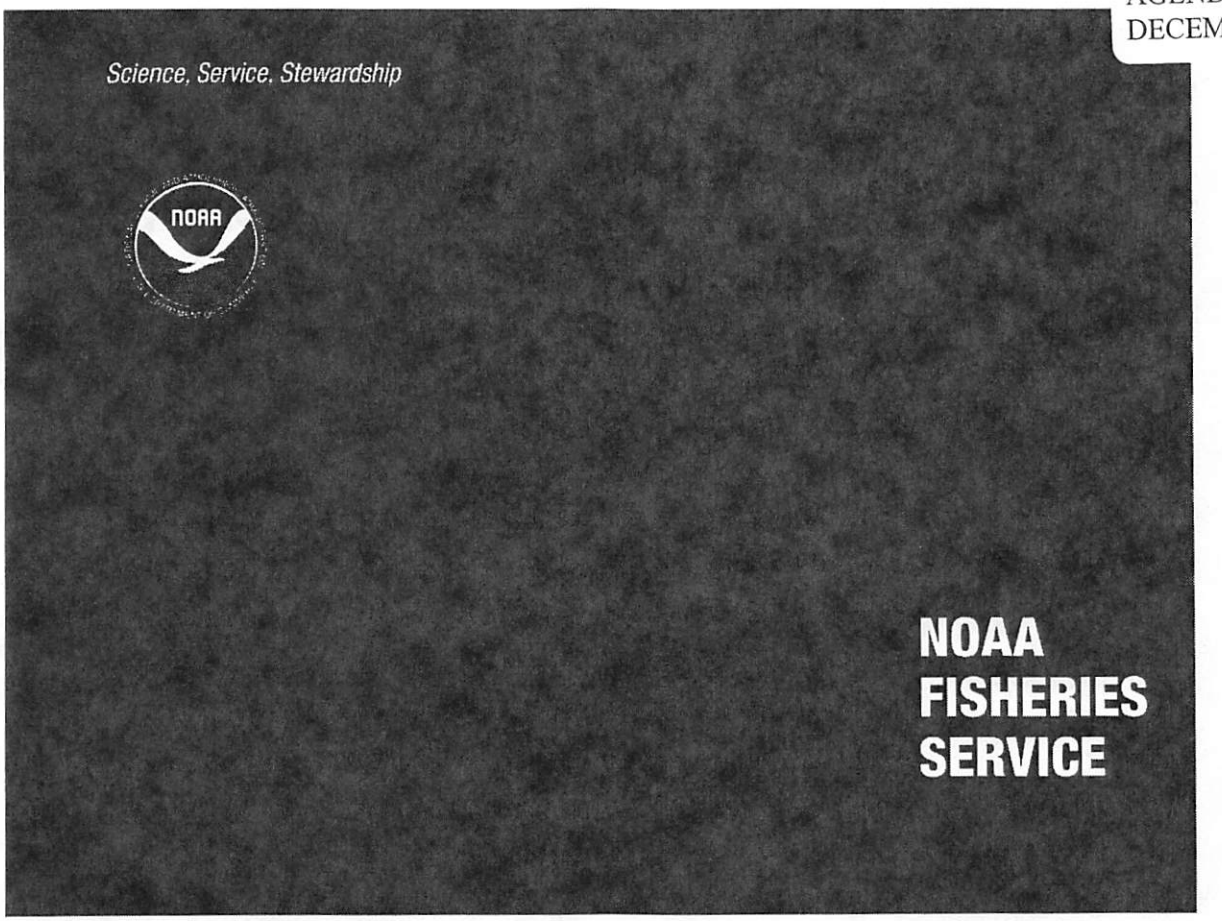


Figure 17. – Kotzebue Area commercial chum salmon harvest and Kobuk River chum salmon index, 1993 - 2009.



Background, Goals, and Requirements

Stock composition analysis of the salmon bycatch from the BS Pollock fishery - WHY?

Suggested by the MS-FMCA

Alaska National Interest Lands Conservation Act (ANILCA)

Ecosystem Approach to Fisheries Management (report to Congress)

Goals

1. Annual enumeration (NMFS)
2. Annual stock composition estimates (NMFS)
3. Application for salmon management (NMFS and ADFG)

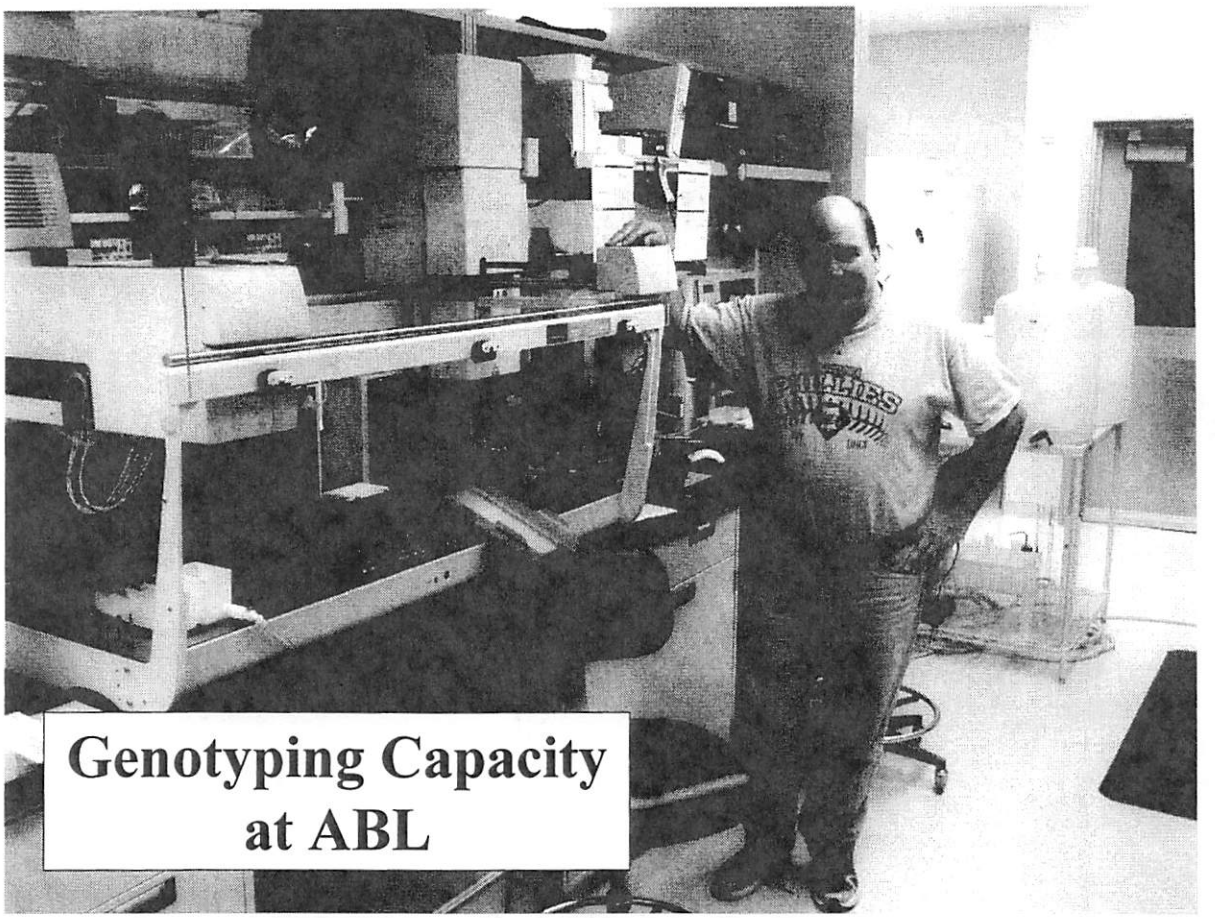
Policy Requirements

1. Full disclosure
2. Public availability of genetic baselines
3. Impartial funding
4. Intergovernmental group between NMFS and ADFG

Technical Requirements

1. Representative sampling (Pella-Geiger Report)
2. Sufficient genotyping capacity
3. Select group of cost-efficient genetic markers
4. Computer database storing genetic data
5. Stock composition analysis software

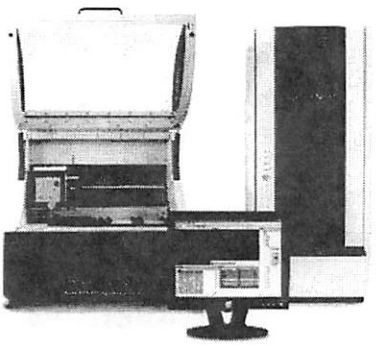
All met at ABL, except #1 which is currently being evaluated.

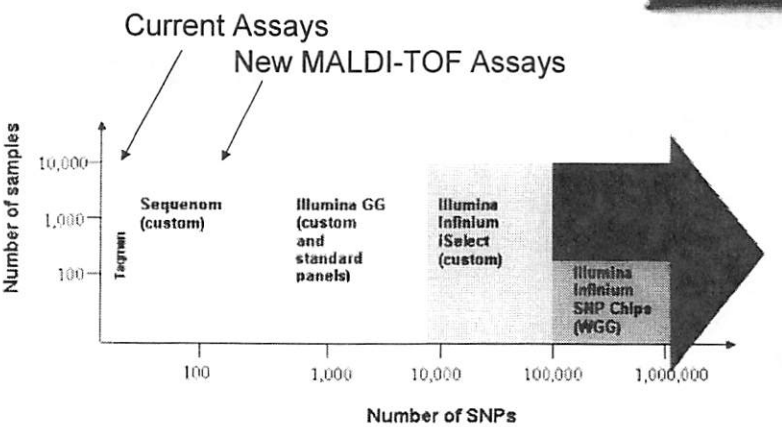


Genotyping Capacity at ABL

SNP Genotyping

122,880 SNPs per day



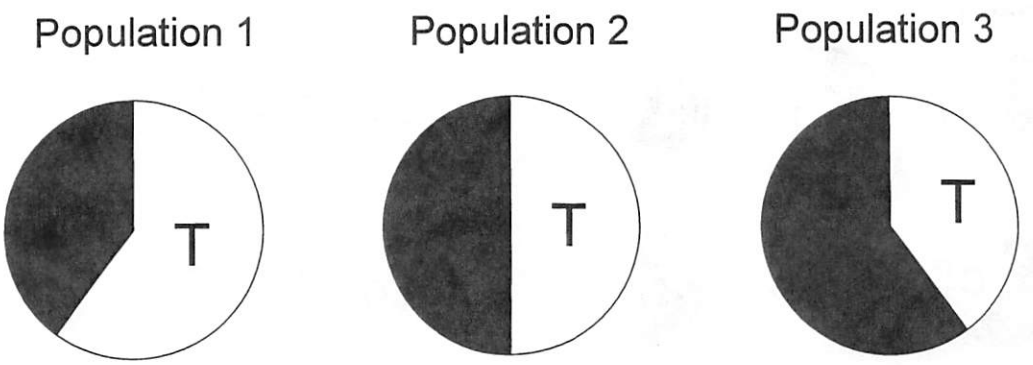


Genotyping Scheme from Harvard Partners Genotyping Facility

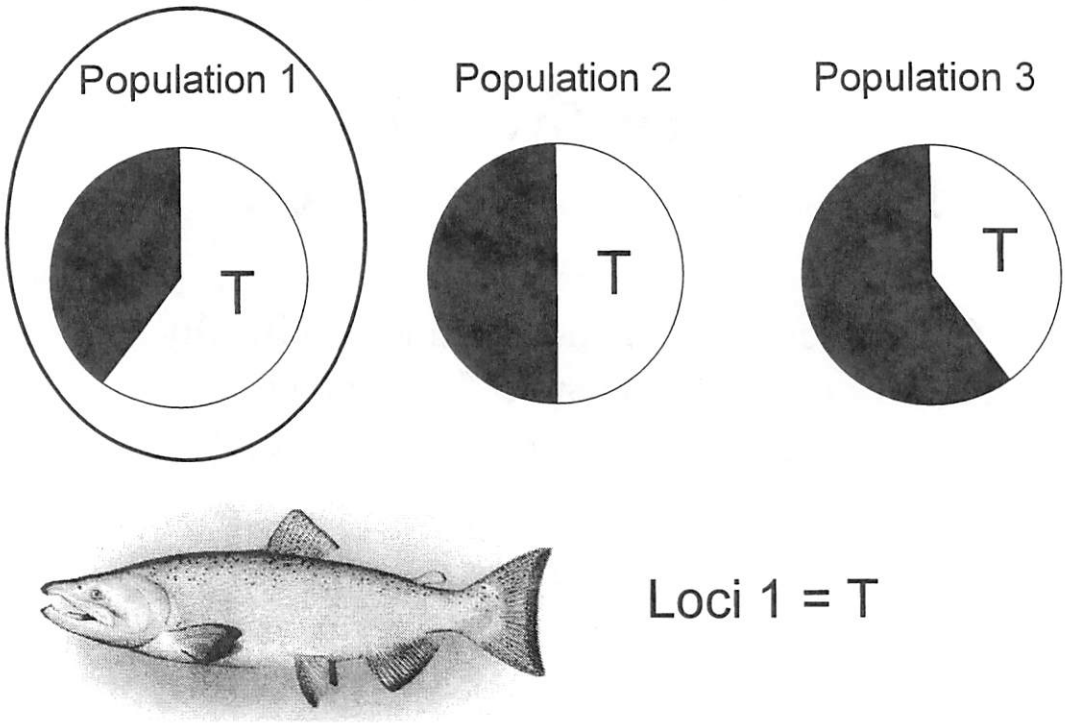
Salmon Bycatch - Resolution of Affected Stocks

Can any current genetic baseline specifically identify fish from the Stony River in a limited sample from the BS groundfish fishery?

Genetic Baseline

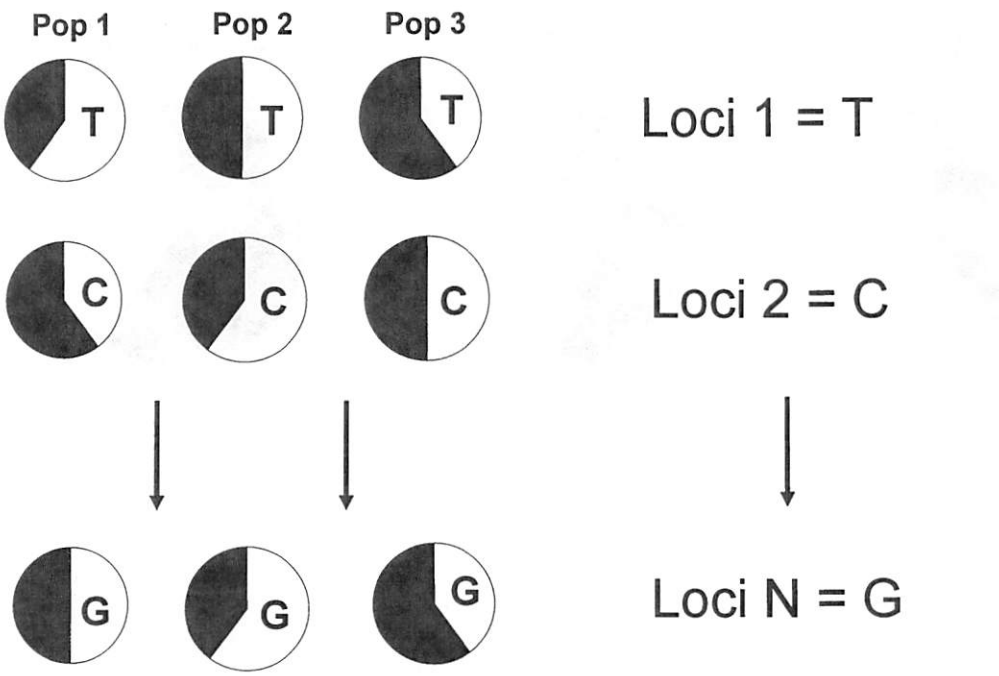


Genetic Baseline

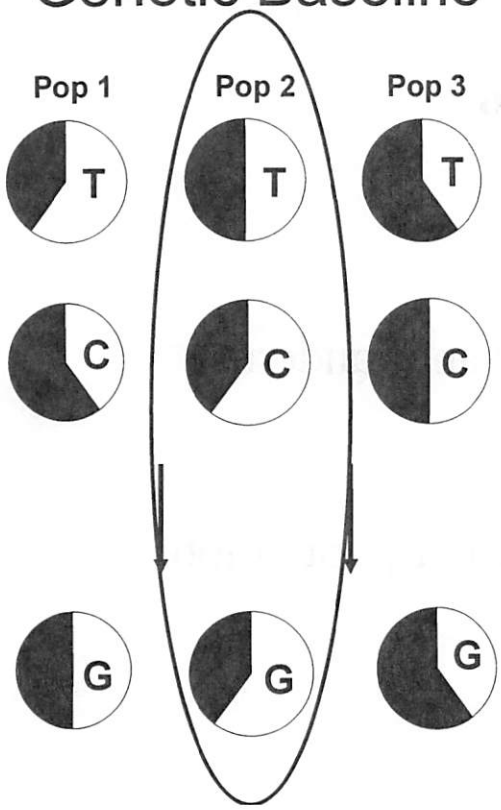


Genetic Baseline

Fish Genotype



Genetic Baseline



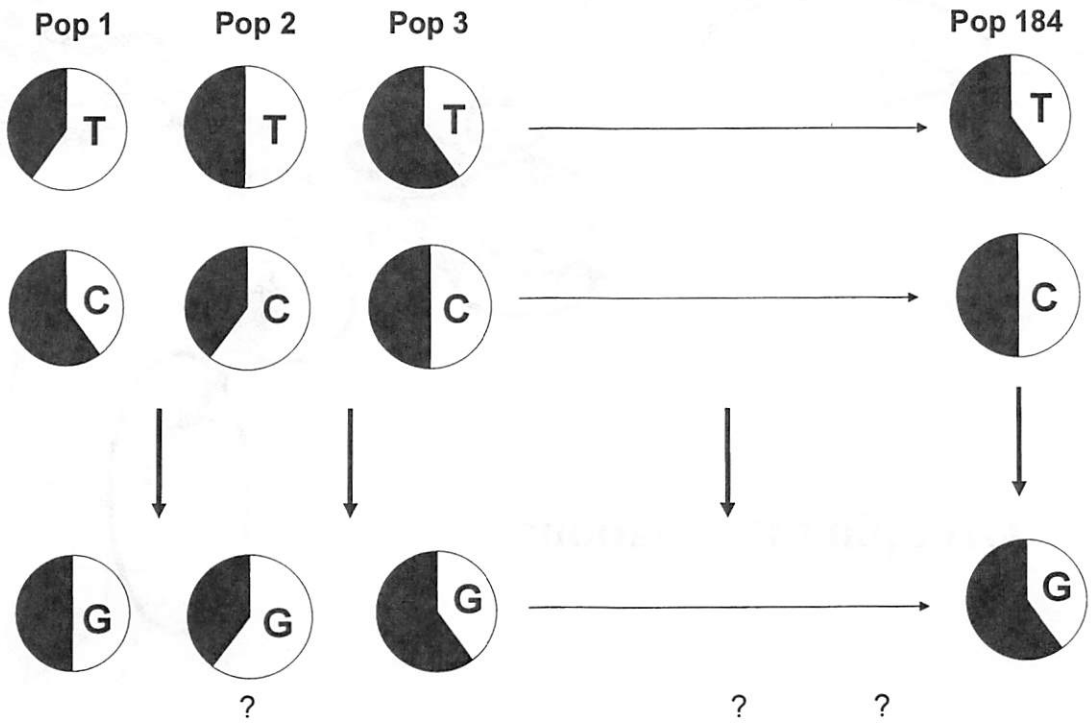
Fish Genotype

Loci 1 = T

Loci 2 = C

Loci N = G

Genetic Baseline – What Population?

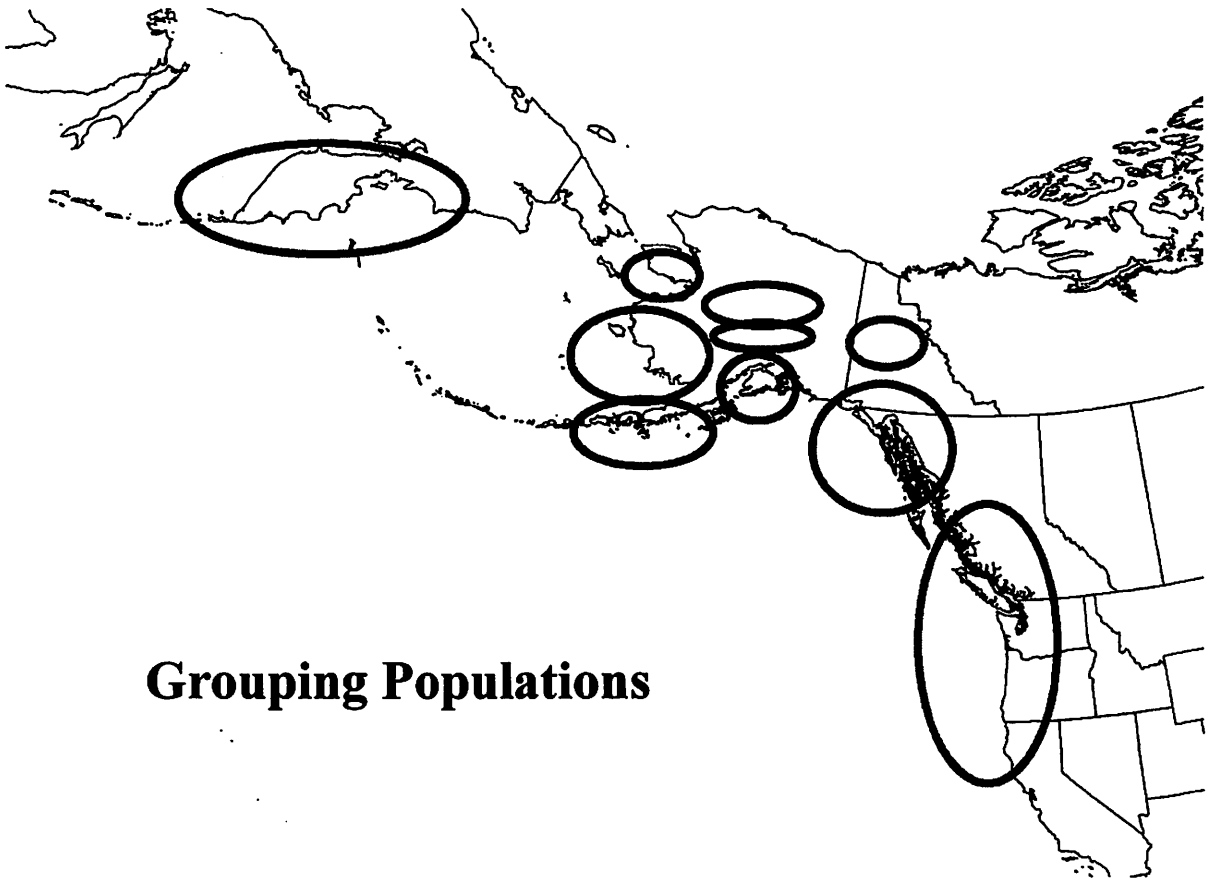


Problem

368 fish in a mixture

All stocks are equal size and randomly distributed

For 184 stocks, expect 2 per population (+/- 5?)

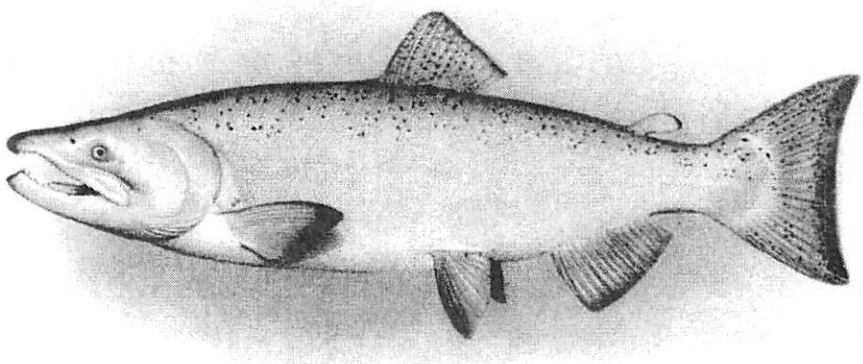


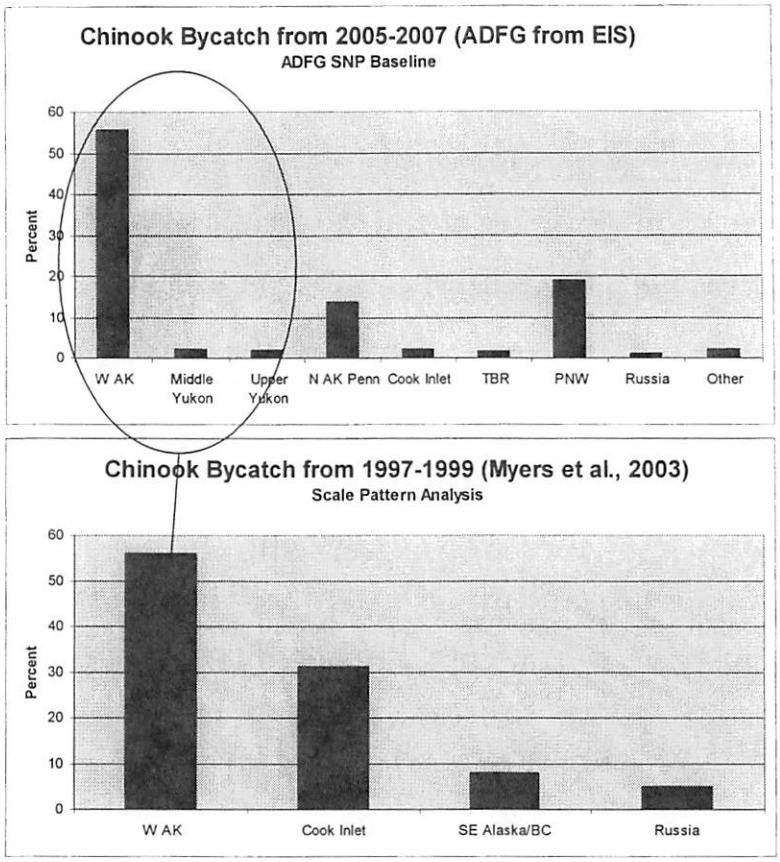
Grouping Populations

Accuracy is affected by sample size, sample collection protocols, regional groupings, marker power, and baseline sample quality/numbers.

Baseline and number of markers should be selected based on public availability, type of marker, power of markers, and costs relative to benefits.

Chinook Bycatch



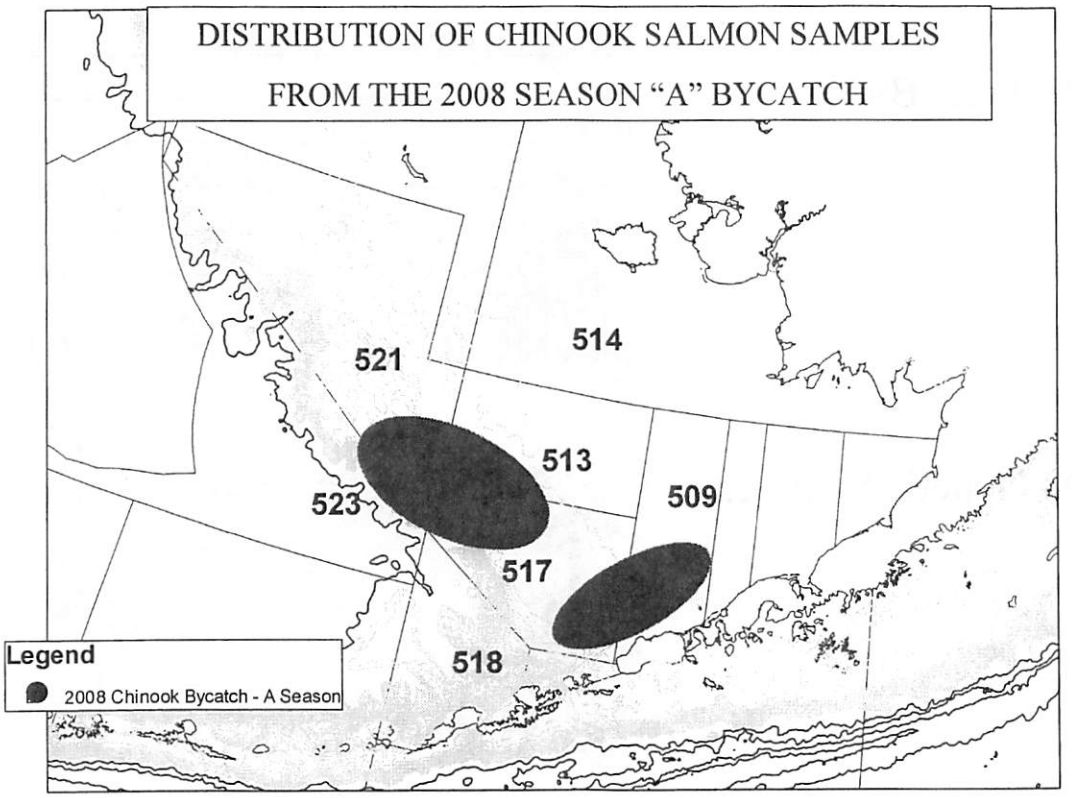


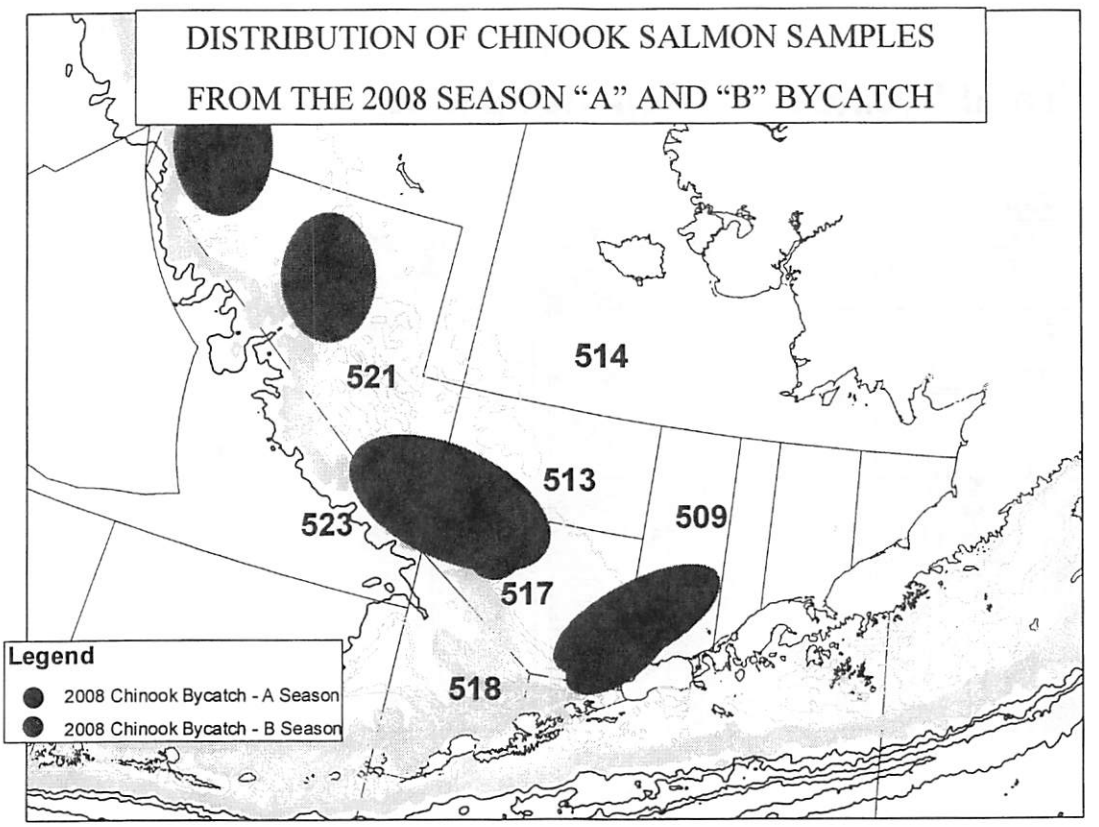
Goals of the 2008 Chinook Bycatch Analysis

The project objectives are to

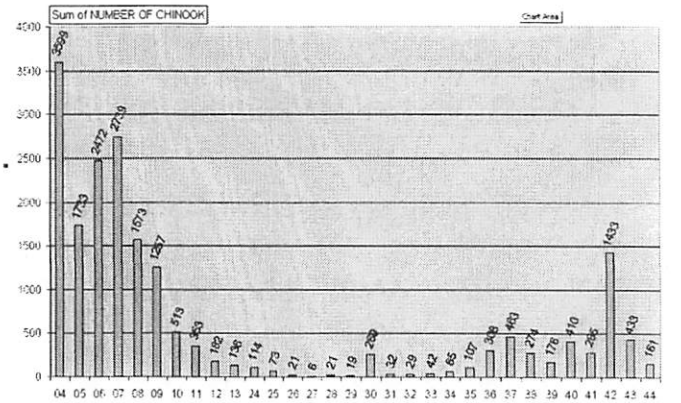
1. Attempt to limit sample bias as best as possible by stratifying the opportunistically collected sample set.

2. Produce stock composition estimates for that limited stratum.

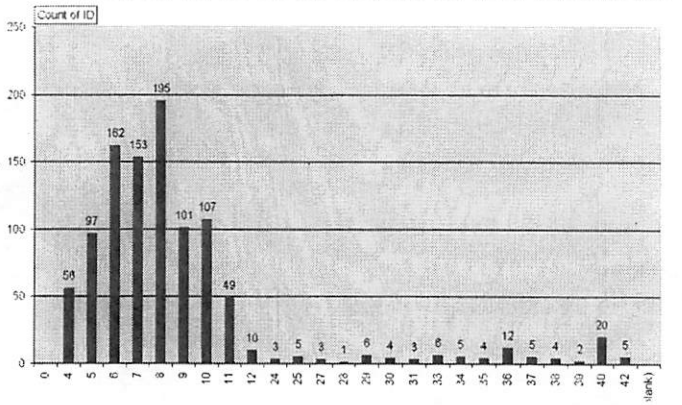

DISTRIBUTION OF CHINOOK SALMON SAMPLES
FROM THE 2008 SEASON "A" BYCATCH
521
514
513
523
509
517
518
Legend
2008 Chinook Bycatch - A Season


DISTRIBUTION OF CHINOOK SALMON SAMPLES
FROM THE 2008 SEASON "A" AND "B" BYCATCH
521
514
513
523
509
517
518
Legend
2008 Chinook Bycatch - A Season
2008 Chinook Bycatch - B Season

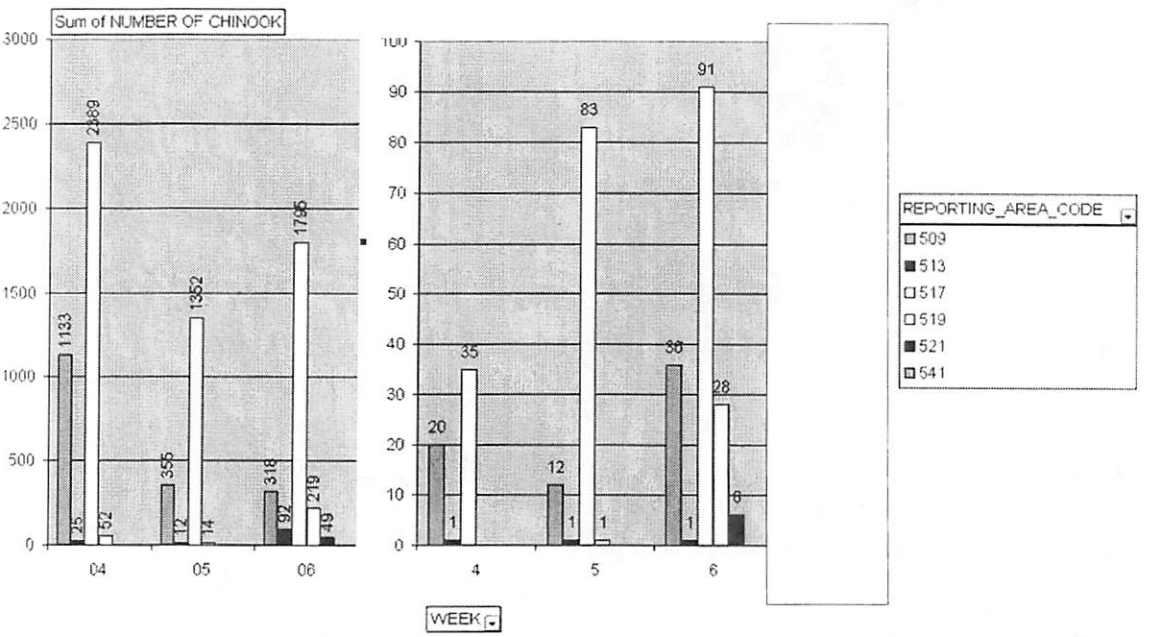
2008 Total Bycatch



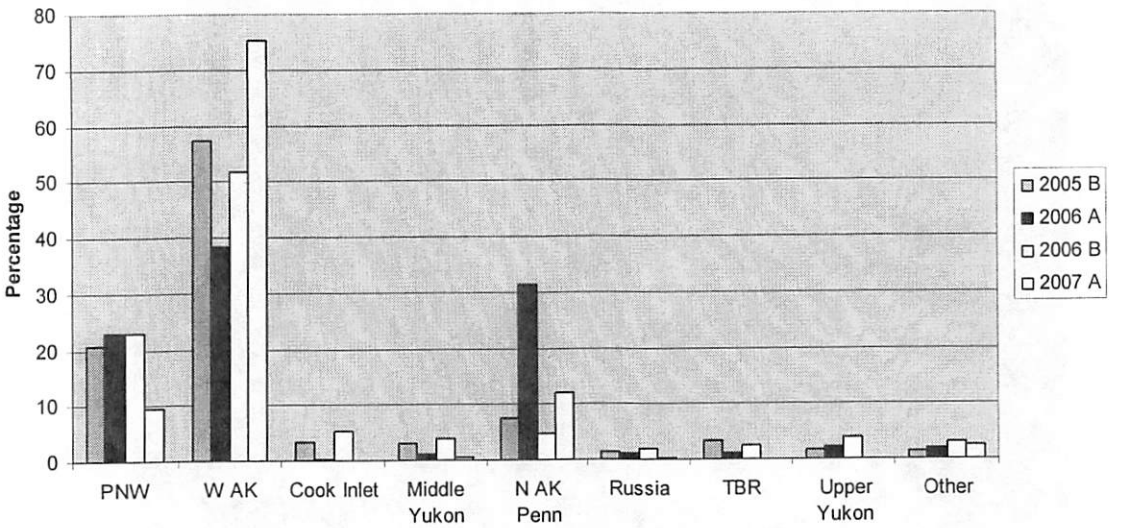
2008 Genetic Samples



Total Bycatch **Genetic Samples**

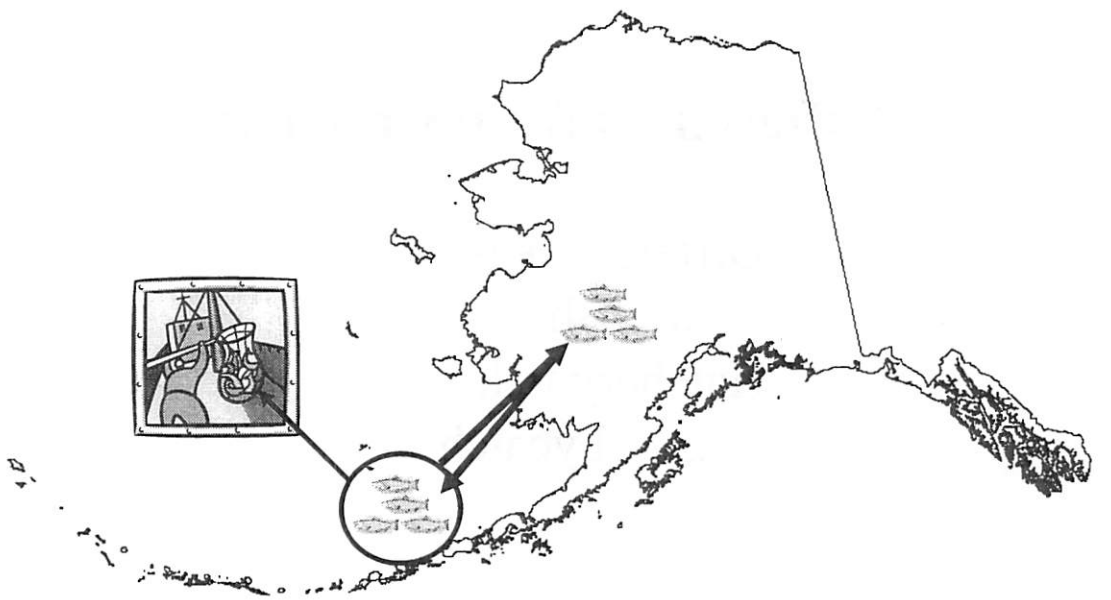


Chinook Bycatch Analysis – 2005-7

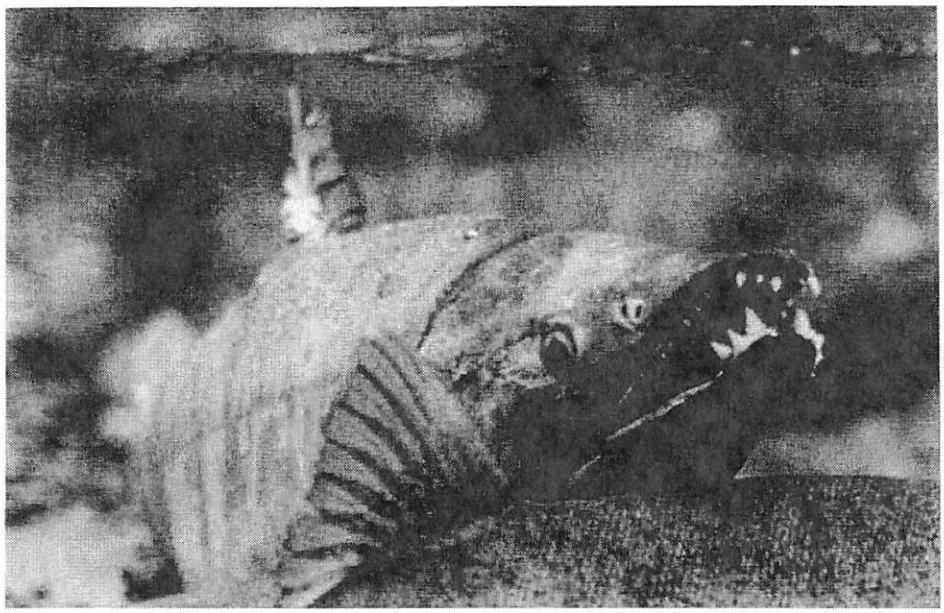


Current AKSSF Proposal

Homogeneity of Chinook Salmon in Hauls

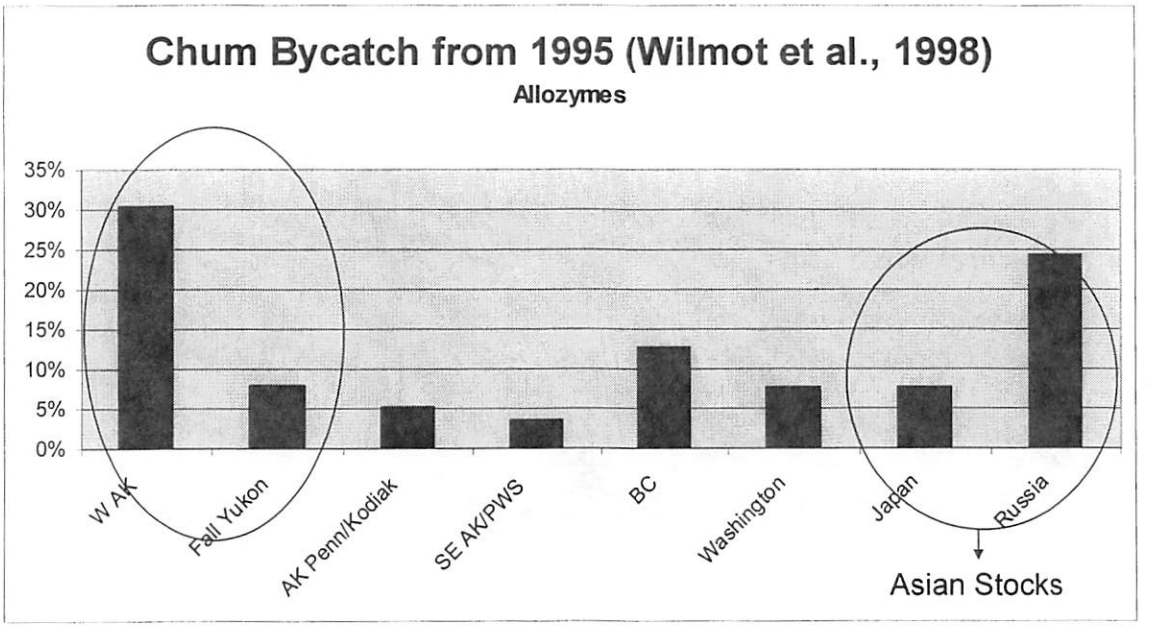


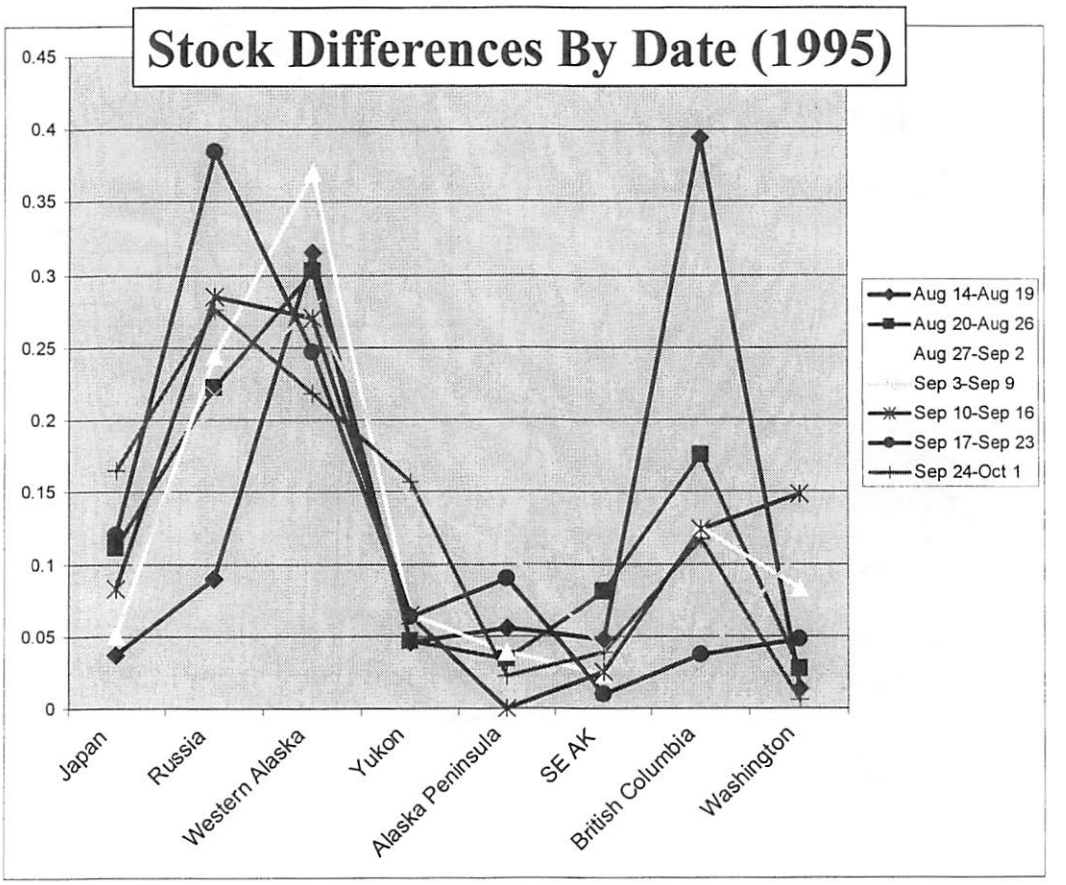
Chum Bycatch



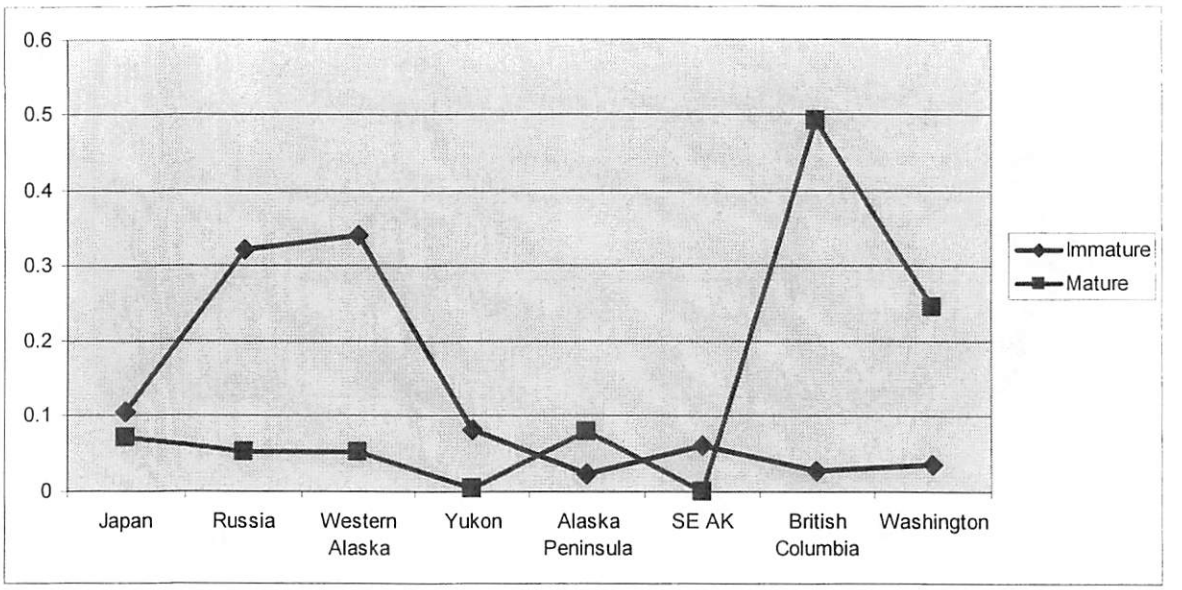
Differences from Chinook

Different season
Asian fish
Hatchery fish
Higher bycatch

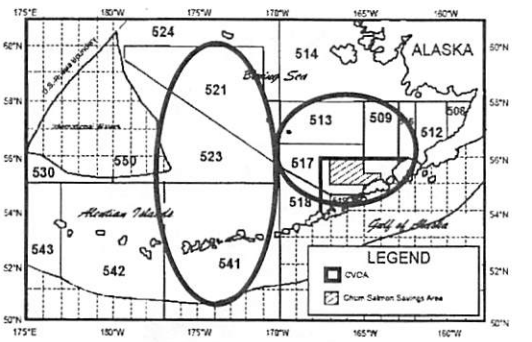

Chum Bycatch from 1995 (Wilmot et al., 1998)
Allozymes
35%
30%
25%
20%
15%
10%
5%
0%
W AK
Fall Yukon
AK Penn/Kodiak
SE AK/PWS
BC
Washington
Japan
Russia
Asian Stocks

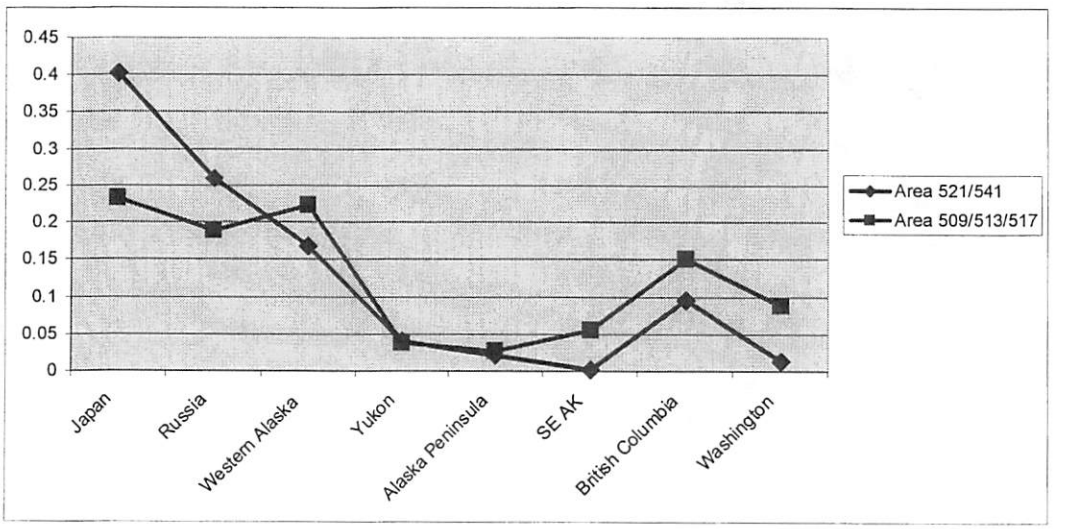

Stock Differences By Date (1995)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Japan
Russia
Western Alaska
Yukon
Alaska Peninsula
SE AK
British Columbia
Washington
Aug 14-Aug 19
Aug 20-Aug 26
Aug 27-Sep 2
Sep 3-Sep 9
Sep 10-Sep 16
Sep 17-Sep 23
Sep 24-Oct 1

Stock Differences by Maturity (1995)



Stock Differences By Area (1994)





AYKSSI Chum Project – Sample Aggregations
1988-2005

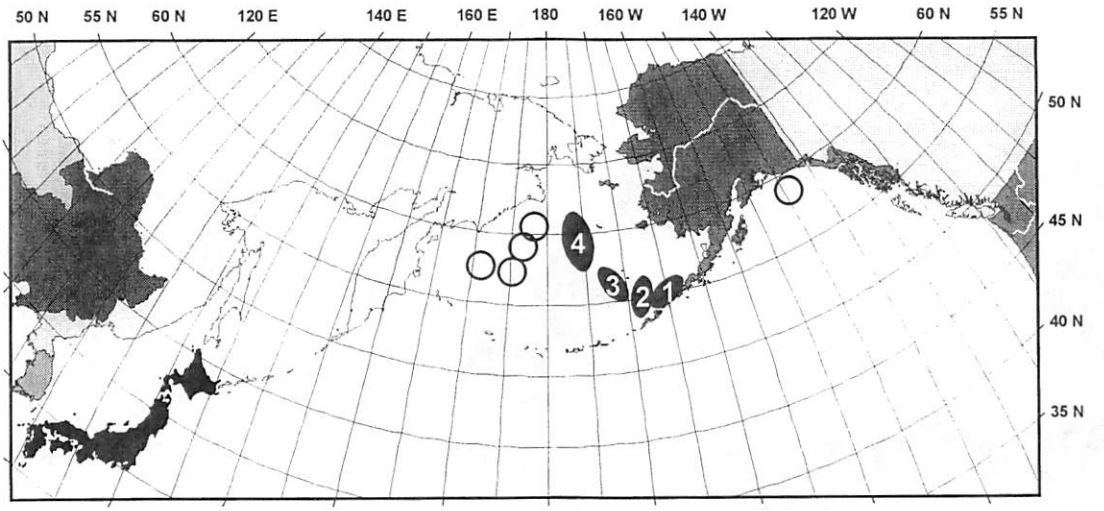
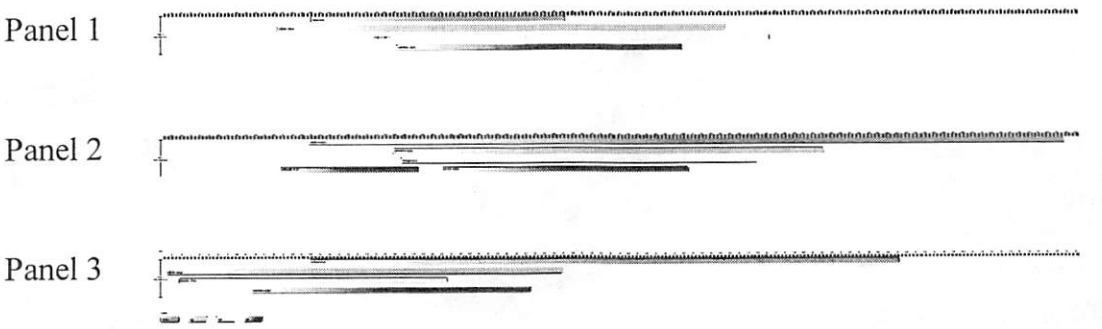
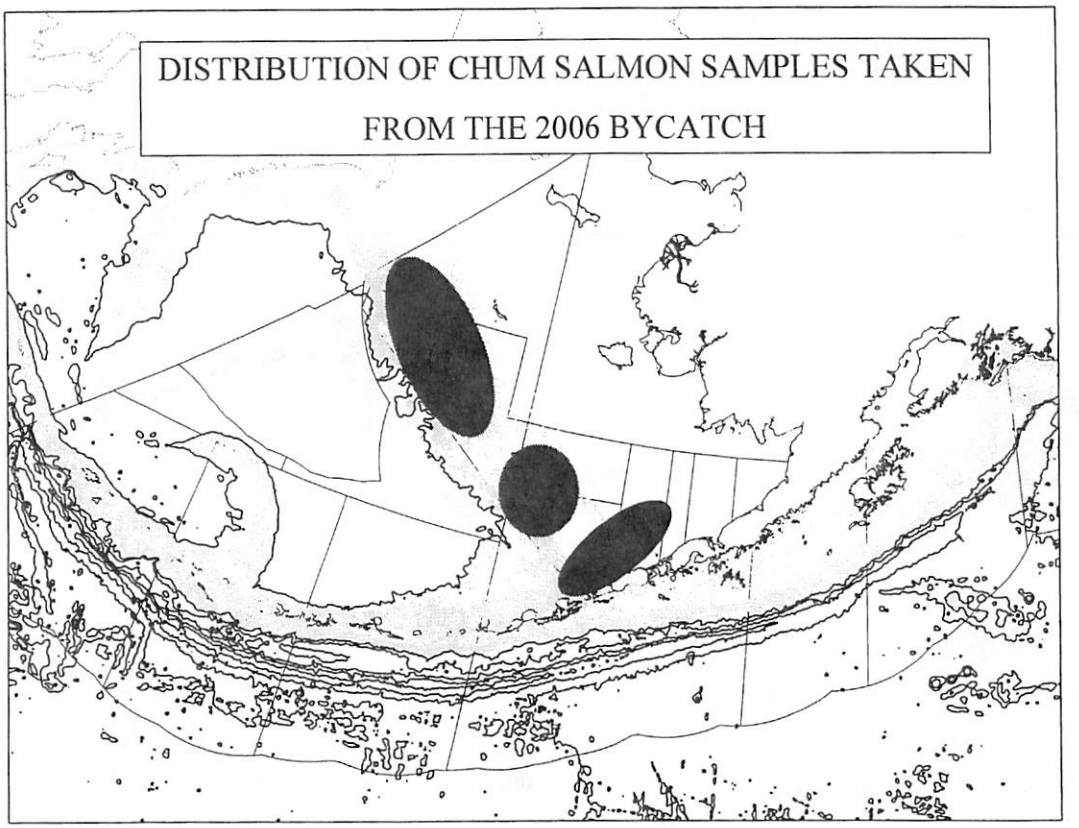
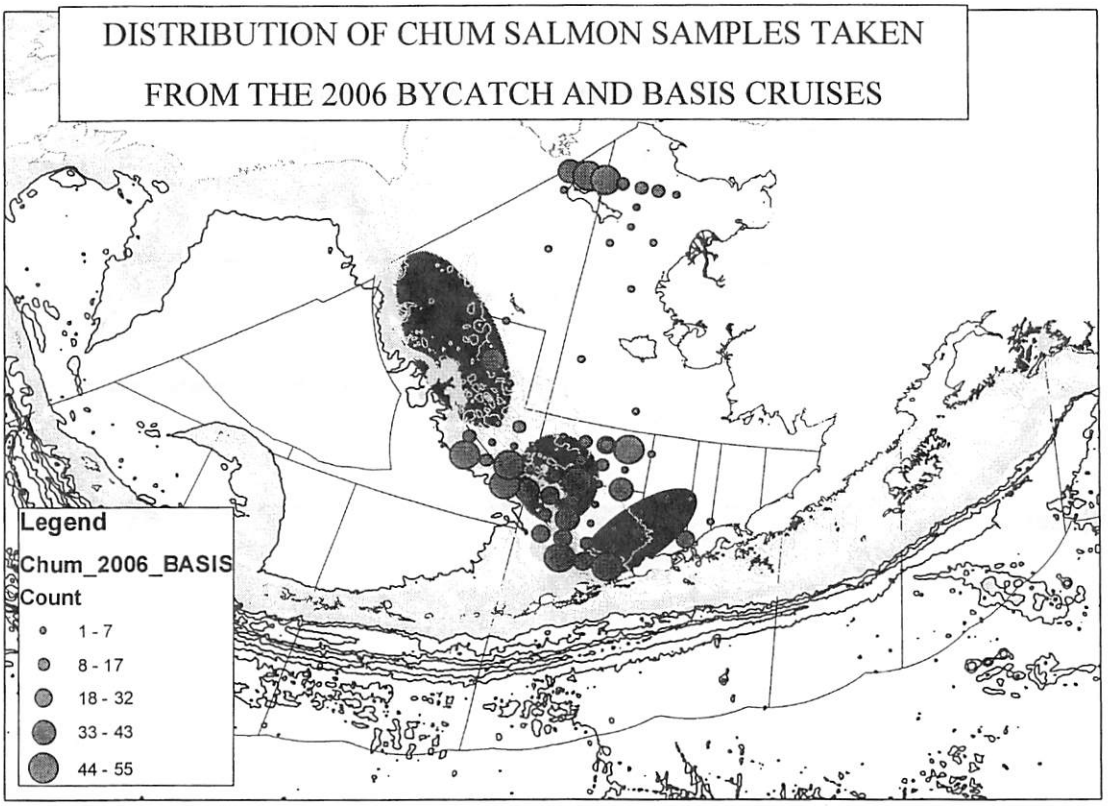


Figure 3. Eastern Bering Sea sampling areas 1 to 4 and sample sites included for the western Bering Sea and GOA. Open circled denote other collections that will be analyzed for contrast. A complete list is n Table 1.

Chum Microsatellite Panel Design
13 microsatellite markers in 3 panels




DISTRIBUTION OF CHUM SALMON SAMPLES TAKEN
FROM THE 2006 BYCATCH


DISTRIBUTION OF CHUM SALMON SAMPLES TAKEN
FROM THE 2006 BYCATCH AND BASIS CRUISES
Legend
Chum_2006_BASIS
Count
1 - 7
8 - 17
18 - 32
33 - 43
44 - 55

Conclusions

Genetic stock composition estimates of the salmon bycatch from the BS groundfish fishery are possible.

These estimates are likely to be controversial and must be completed under full public disclosure using publicly available baselines.

The main limitations are sample size and inability for accurate individual stock identification across all populations.

Acknowledgements

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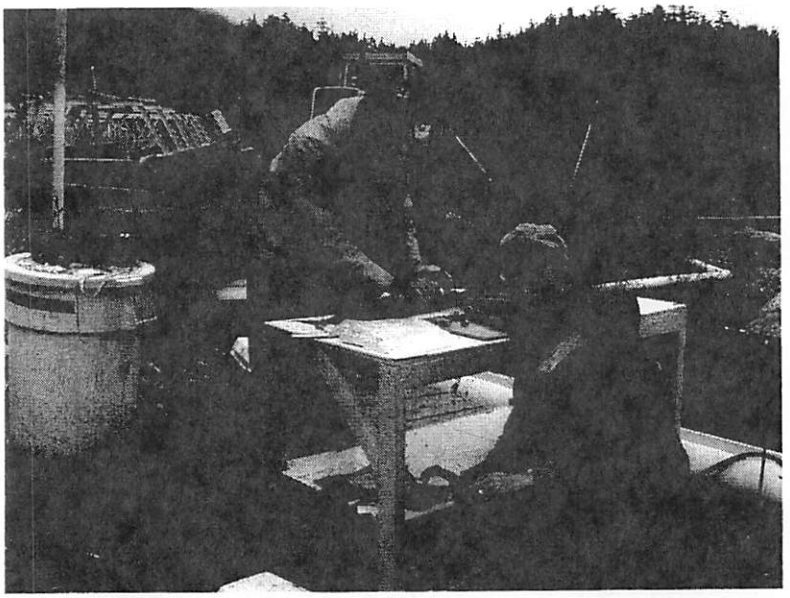
Hanhvan Nguyen
Andy Gray
Ed Farley, PhD
Jim Murphy

ADFG

UAF-SFOS

DFO



Area M Summary Information

Per discussion at the October 29th, Salmon Bycatch Workgroup meeting (see Item C-4(b)(2)), a request was made for inclusion of Area M chum salmon catch and escapement data in Council briefing materials for this meeting.

Excerpted here are data from the 2009 Season Summary (Murphy et al., 2009):
http://www.cf.adfg.state.ak.us/region4/finfish/salmon/penin/09summaryaream.pdf
and from the 2008 Annual Management Report (Hartill, 2009):
http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr09-33.pdf

Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Areas Salmon Season Summary, 2009

by
Bob Murphy, Aaron Poetter, Trent Hartill, Matt Keyse, and Alex Bernard

November 16, 2009

The following is an overview of the 2009 Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Areas (Figure 1) commercial salmon fishing season. Total harvest presented from the 2009 commercial salmon fishing season should closely approximate final harvest numbers for all species. The 2009 commercial salmon harvest in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Areas totaled 11,088 Chinook, 4,152,682 sockeye, 360,228 coho, 9,774,769 pink, and 1,792,557 chum salmon (Table 1). Subsistence salmon harvest will be reported in the 2009 annual management report (AMR). Data reported in this report are considered preliminary and supersede any data previously published.

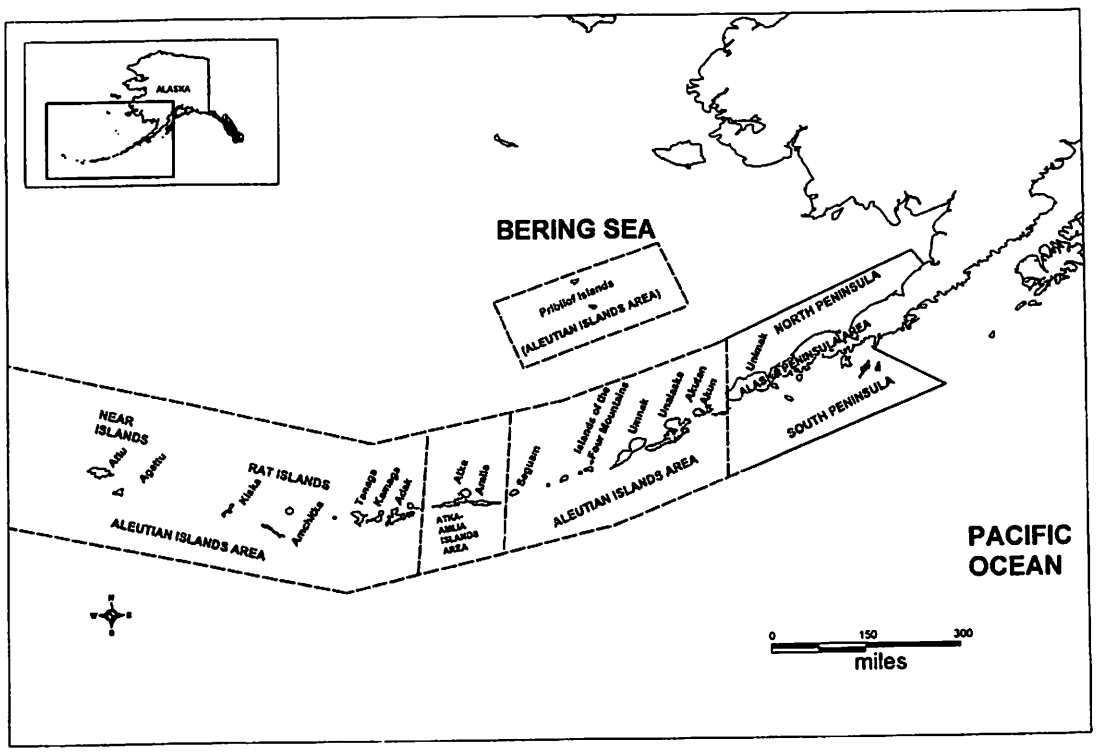


Figure 1.-Map of the Aleutian Islands, Atka-Amlia Islands, and Alaska Peninsula Management Areas.

Table 1.-Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands commercial salmon harvest, 2009.

	Number of Fish					
Location	Chinook	Sockeye	Coho	Pink	Chum	Total
South Peninsula	7,899	1,725,463	292,611	7,873,776	1,684,566	11,584,315
North Peninsula	3,189	2,426,516	67,601	275,083	105,986	2,878,375
Aleutian Islands	0	703	16	1,625,910	2,005	1,628,634
Atka & Amlia Islands	0	0	0	0	0	0
Total	11,088	4,152,682	360,228	9,774,769	1,792,557	16,091,324
Projected 2009 Harvest	7,300	4,218,000	310,000	8,094,000	1,017,000	13,646,300
1999-2008 Average	11,012	3,884,301	249,278	5,221,335 [a]	919,870	10,285,796

[a] Averages for pink salmon include only the odd-numbered years 1999, 2001, 2003, 2005, and 2007.

The commercial harvests of Chinook, coho, pink, and chum salmon were all above 2009 harvest projections and the most recent 10-year average harvest (Table 1). Preliminary exvessel value of salmon harvested in Area M totaled $26,533,097 and is presented in Table 2 by fishery and species. Value information was generated from fish tickets and does not include post season adjustments paid to fishermen.

Table 2.-Preliminary commercial ex-vessel values by fishery and species, 2009.

	Value					
Location	Chinook	Sockeye	Coho	Pink	Chum	Total
S. Unimak-Shumagin June Fishery	$91,147	$4,719,241	$235	$777,219	$777,849	$6,365,691
Southeastern District Mainland Fishery June 1-July 25	$1,259	$783,817	$3,242	$37,722	$25,166	$851,206
South Peninsula Post-June Fishery	$15,669	$1,857,271	$441,938	$3,685,974	$1,542,434	$7,543,287
South Peninsula Total	$108,075	$7,360,329	$445,415	$4,500,916	$2,345,449	$14,760,184
Northwestern District	$71	$205,814	$108	$10,873	$190,628	$407,494
Northern District	$36,297	$9,983,883	$195,471	$146	$73,085	$10,288,882
North Peninsula Total	$36,368	$10,189,697	$195,579	$11,019	$263,713	$10,696,376
Aleutian Islands Total	$0	$3,176	$27	$1,070,631	$2,704	$1,076,538
Atka-Amlia Islands Total	$0	$0	$0	$0	$0	$0
Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands	$144,443	$17,553,202	$641,021	$5,582,565	$2,611,866	$26,533,097

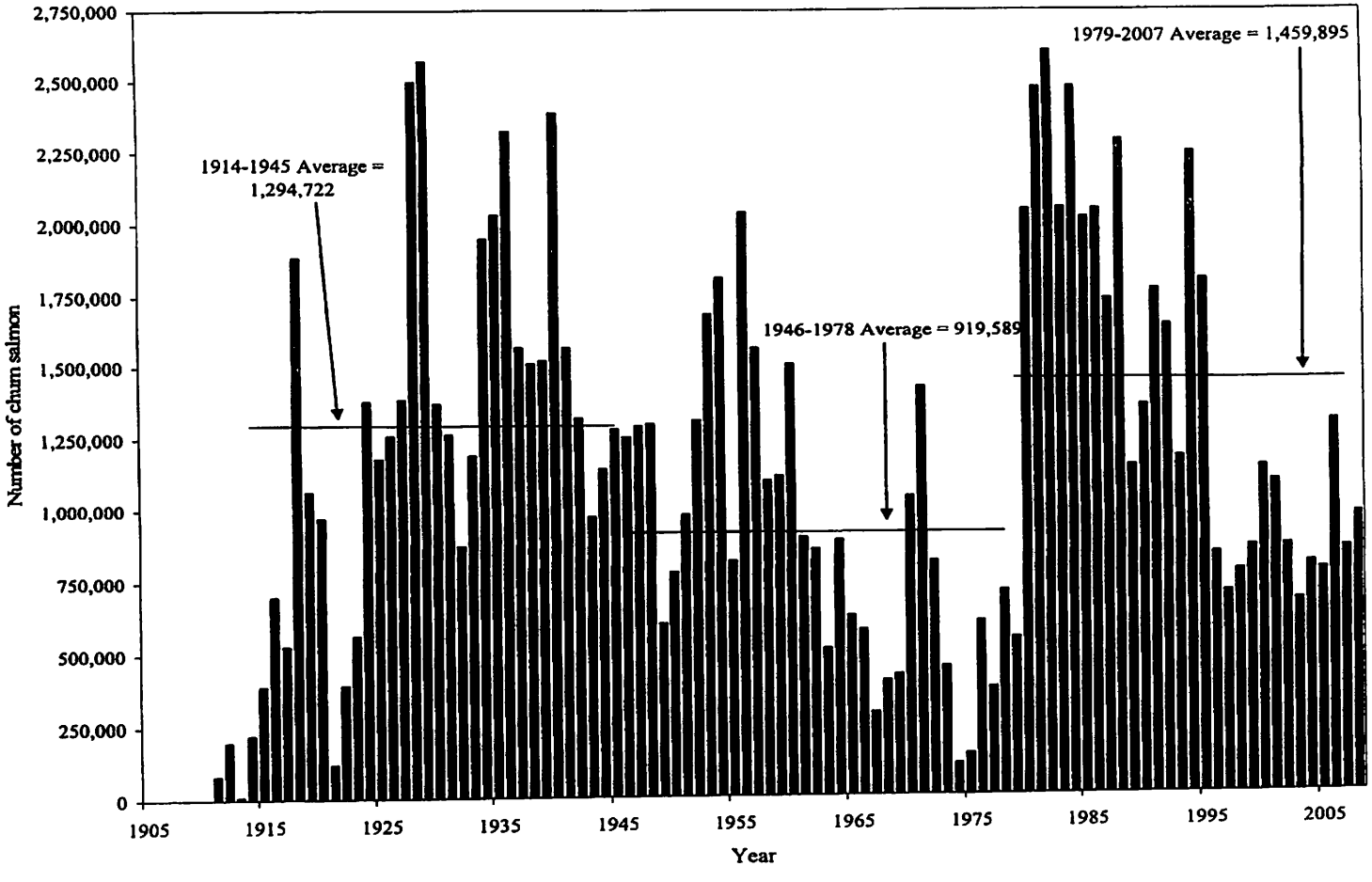


Figure 10.–The combined Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands areas harvest of chum salmon by year, 1905-2008.

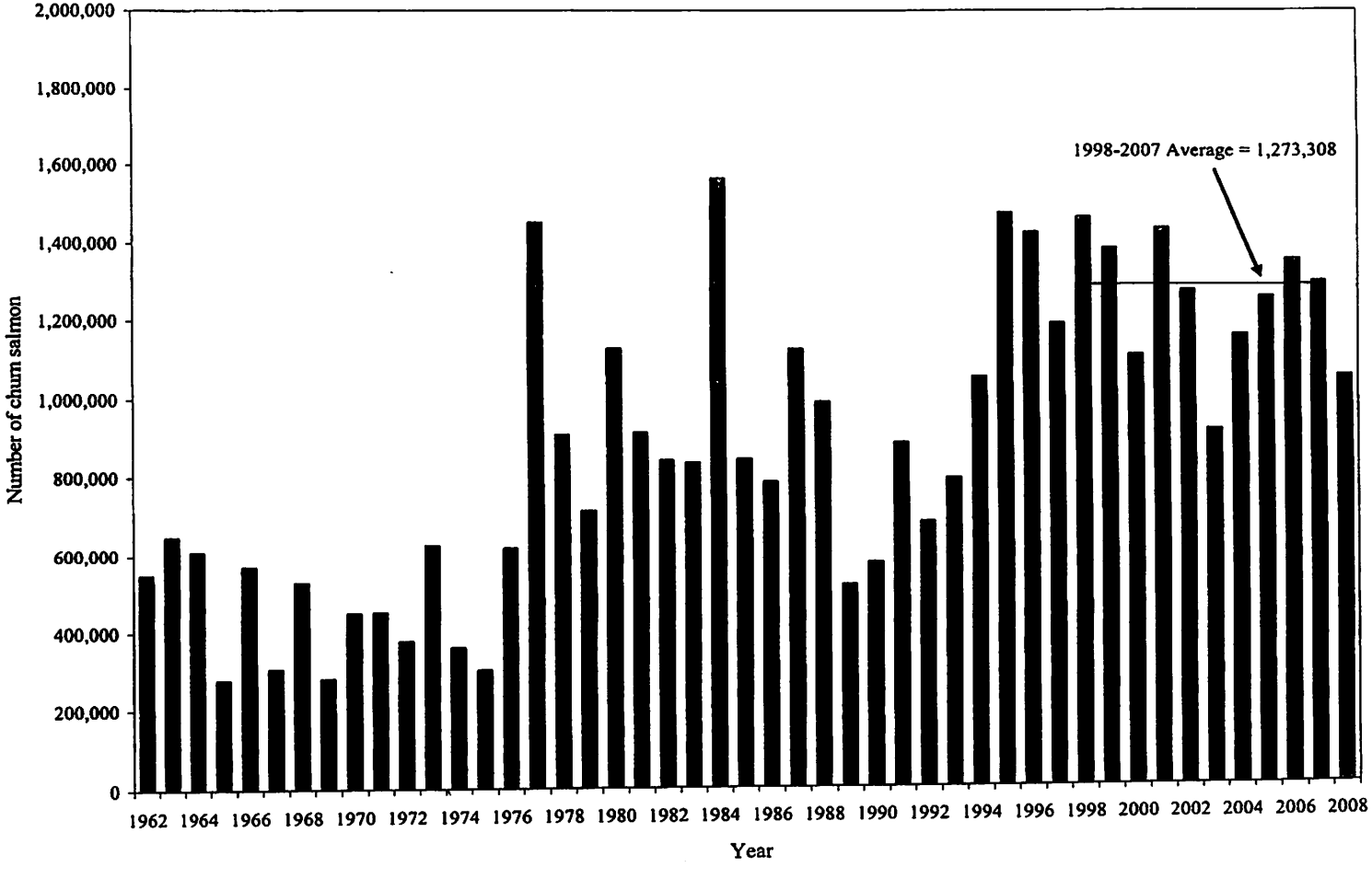


Figure 14.–The Alaska Peninsula chum salmon total estimated escapement by year, 1962-2008.

Appendix B1.–Alaska Peninsula and Aleutian Islands commercial salmon harvest in numbers of fish by year, for the South Alaska Peninsula, North Alaska Peninsula, Aleutian Islands, and Atka-Amlia areas, 1906-2008.

Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1906	South Peninsula	0	0	0	0	0	0
	North Peninsula	1,500	135,000	0	0	0	136,500
	Aleutian Islands	0	0	0	0	0	0
	Total	1,500	135,000	0	0	0	136,500
1907	South Peninsula	0	0	0	0	0	0
	North Peninsula	1,700	66,500	3,200	1,500	0	72,900
	Aleutian Islands	0	0	0	0	0	0
	Total	1,700	66,500	3,200	1,500	0	72,900
1908	South Peninsula	0	69,400	0	0	0	69,400
	North Peninsula	1,500	166,900	0	0	0	168,400
	Aleutian Islands	0	0	0	0	0	0
	Total	1,500	236,300	0	0	0	237,800
1909	South Peninsula	0	108,400	7,200	0	0	115,600
	North Peninsula	1,500	143,000	0	0	1,000	145,500
	Aleutian Islands	0	0	0	0	0	0
	Total	1,500	251,400	7,200	0	1,000	261,100
1910	South Peninsula	0	46,300	5,500	0	0	51,800
	North Peninsula	0	0	0	0	0	0
	Aleutian Islands	0	0	0	0	0	0
	Total	0	46,300	5,500	0	0	51,800
1911	South Peninsula	0	240,800	12,400	25,200	83,000	361,400
	North Peninsula	0	129,600	0	0	0	129,600
	Aleutian Islands	0	9,300	0	0	0	9,300
	Total	0	379,700	12,400	25,200	83,000	500,300
1912	South Peninsula	0	334,400	27,000	40,400	195,000	596,800
	North Peninsula	900	252,700	11,000	0	2,400	267,000
	Aleutian Islands	0	0	0	0	0	0
	Total	900	587,100	38,000	40,400	197,400	863,800
1913	South Peninsula	1,800	299,700	0	0	7,000	308,500
	North Peninsula	600	888,800	18,700	0	2,000	910,100
	Aleutian Islands	0	0	0	0	0	0
	Total	2,400	1,188,500	18,700	0	9,000	1,218,600
1914	South Peninsula	600	628,900	0	311,000	221,100	1,171,500
	North Peninsula	8,100	1,325,100	0	0	0	1,333,200
	Aleutian Islands	0	0	0	0	0	0
	Total	8,700	1,954,000	9,900	311,000	221,100	2,504,700
1915	South Peninsula	4,800	367,900	16,200	120,100	333,100	842,100
	North Peninsula	14,000	1,974,300	0	0	54,800	2,043,100
	Aleutian Islands	0	0	0	0	0	0
	Total	18,800	2,342,200	16,200	120,100	387,900	2,885,200

-continued-

Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1916	South Peninsula	6,800	730,900	34,100	576,100	508,900	1,856,800
	North Peninsula	44,200	1,974,700	0	2,600	191,400	2,212,900
	Aleutian Islands	0	76,500	1,200	180,300	100	258,100
	Total	51,000	2,782,100	35,300	759,000	700,400	4,327,800
1917	South Peninsula	6,400	1,486,100	4,600	72,100	415,500	1,984,700
	North Peninsula	20,000	679,600	6,800	600	90,300	797,300
	Aleutian Islands	0	70,400	3,800	600	23,100	97,900
	Total	26,400	2,236,100	15,200	73,300	528,900	2,879,900
1918	South Peninsula	8,700	1,014,100	16,300	2,150,000	1,501,000	4,690,900
	North Peninsula	9,700	1,208,500	0	1,200	252,300	1,471,700
	Aleutian Islands	0	55,200	4,400	75,600	135,200	270,400
	Total	18,400	2,277,800	20,700	2,227,600	1,888,500	6,433,000
1919	South Peninsula	9,600	619,100	56,100	80,200	921,400	1,686,400
	North Peninsula	19,600	389,200	0	12,000	143,500	564,300
	Aleutian Islands	0	3,900	800	4,000	0	8,700
	Total	29,200	1,012,200	56,900	96,200	1,064,900	2,259,400
1920	South Peninsula	7,800	1,142,300	47,700	2,109,800	934,000	4,241,600
	North Peninsula	19,000	1,371,900	0	0	37,000	1,427,900
	Aleutian Islands	0	10,100	2,800	0	0	12,900
	Total	26,800	2,524,300	50,500	2,109,800	971,000	5,682,400
1921	South Peninsula	700	830,700	1,500	47,300	84,600	964,800
	North Peninsula	12,500	1,746,500	0	0	32,800	1,791,800
	Aleutian Islands	0	0	0	0	0	0
	Total	13,200	2,577,200	1,500	47,300	117,400	2,756,600
1922	South Peninsula	6,900	3,376,800	2,200	756,700	349,300	4,491,900
	North Peninsula	10,400	667,900	0	0	42,900	721,200
	Aleutian Islands	0	14,000	0	0	0	14,000
	Total	17,300	4,058,700	2,200	756,700	392,200	5,227,100
1923	South Peninsula	4,100	1,827,200	75,300	143,600	538,900	2,589,100
	North Peninsula	9,100	731,700	100	0	25,800	766,700
	Aleutian Islands	0	0	0	0	0	0
	Total	13,200	2,558,900	75,400	143,600	564,700	3,355,800
1924	South Peninsula	3,900	1,352,000	127,300	3,931,300	1,330,700	6,745,200
	North Peninsula	10,500	701,700	0	0	48,400	760,600
	Aleutian Islands	0	24,900	0	673,800	100	698,800
	Total	14,400	2,078,600	127,300	4,605,100	1,379,200	8,204,600
1925	South Peninsula	10,700	820,500	127,100	382,100	1,116,800	2,457,200
	North Peninsula	10,600	400,200	0	0	53,900	464,700
	Aleutian Islands	0	18,600	0	3,800	9,100	31,500
	Total	21,300	1,239,300	127,100	385,900	1,179,800	2,953,400
1926	South Peninsula	9,500	3,071,500	193,800	3,719,700	1,179,800	8,174,300
	North Peninsula	23,900	672,900	0	0	71,500	768,300
	Aleutian Islands	0	1,300	0	521,700	7,800	530,800
	Total	33,400	3,745,700	193,800	4,241,400	1,259,100	9,473,400

continued-

Appendix B1.–Page 3 of 10.

Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1927	South Peninsula	9,600	714,700	125,300	1,455,500	1,299,700	3,604,800
	North Peninsula	16,500	230,600	100	0	87,000	334,200
	Aleutian Islands	0	17,300	0	334,600	0	351,900
	Total	26,100	962,600	125,400	1,790,100	1,386,700	4,290,900
1928	S.Pen & Aleutian	7,700	971,500	96,600	900,900	2,416,300	4,393,000
	North Peninsula	4,600	855,600	0	0	83,500	943,700
	Total	12,300	1,827,100	96,600	900,900	2,499,800	5,336,700
1929	S.Pen & Aleutian	10,500	935,800	84,500	1,793,500	2,429,000	5,253,300
	North Peninsula	4,100	878,000	0	0	145,200	1,027,300
	Total	14,600	1,813,800	84,500	1,793,500	2,574,200	6,280,600
1930	S.Pen & Aleutian	10,900	935,200	161,100	6,094,800	1,278,100	8,480,100
	North Peninsula	3,800	167,700	0	0	93,400	265,200
	Total	14,700	1,102,900	161,100	6,094,800	1,371,800	8,745,300
1931	S.Pen & Aleutian	11,000	1,863,200	128,700	997,900	1,216,000	4,211,800
	North Peninsula	1,300	761,000	0	0	54,900	817,200
	Total	12,300	2,624,200	128,700	997,900	1,265,900	5,029,000
1932	S.Pen & Aleutian	17,400	2,977,300	112,300	3,604,800	817,300	7,529,100
	North Peninsula	3,200	977,100	0	0	56,300	1,036,600
	Total	20,600	3,954,400	112,300	3,604,800	873,600	8,565,700
1933	S.Pen & Aleutian	12,600	1,996,700	190,000	3,109,200	1,173,900	6,482,400
	North Peninsula	1,100	350,100	0	0	16,000	367,200
	Total	13,700	2,346,800	190,000	3,109,200	1,189,900	6,849,600
1934	S.Pen & Aleutian	17,600	1,372,400	247,100	6,538,500	1,940,300	10,115,900
	North Peninsula	1,600	1,091,300	0	400	13,000	1,106,300
	Total	19,200	2,463,700	247,100	6,538,900	1,953,300	11,222,200
1935	S.Pen & Aleutian	13,900	978,400	117,200	5,386,200	2,003,100	8,498,800
	North Peninsula	1,000	479,200	0	100	33,800	514,100
	Total	14,900	1,457,600	117,200	5,386,300	2,036,900	9,012,900
1936	S.Pen & Aleutian	14,400	3,662,600	284,600	9,471,000	2,310,900	15,743,500
	North Peninsula	1,000	610,700	0	2,800	19,000	633,500
	Total	15,400	4,273,300	284,600	9,473,800	2,329,900	16,377,000
1937	S.Pen & Aleutian	9,300	1,558,000	73,900	9,302,000	1,506,700	12,449,900
	North Peninsula	1,600	860,900	0	100	65,600	928,200
	Total	10,900	2,418,900	73,900	9,302,100	1,572,300	13,378,100
1938	S.Pen & Aleutian	6,400	772,100	220,700	7,169,100	1,476,600	9,644,900
	North Peninsula	5,900	1,009,600	0	0	34,700	1,050,200
	Total	12,300	1,781,700	220,700	7,169,100	1,511,300	10,695,100
1939	S.Pen & Aleutian	16,500	1,881,700	98,900	6,005,300	1,440,600	9,443,000
	North Peninsula	3,900	746,200	0	0	82,200	832,300
	Total	20,400	2,527,900	98,900	6,005,300	1,522,800	10,275,300
1940	S.Pen & Aleutian	9,100	1,040,300	184,200	7,182,800	2,326,300	10,472,700
	North Peninsula	700	678,900	0	0	65,600	745,200
	Total	9,800	1,719,200	184,200	7,182,800	2,391,900	11,487,900

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1941	S.Pen & Aleutian	13,000	1,072,000	183,000	5,347,000	1,542,000	8,157,800
	North Peninsula	700	491,700	0	3,200	30,200	525,800
	Total	13,700	1,563,700	183,000	5,350,200	1,572,200	8,682,800
1942	S.Pen & Aleutian	4,800	810,100	123,000	6,762,600	1,321,100	9,021,600
	North Peninsula	0	0	0	0	0	0
	Total	4,800	810,100	123,000	6,762,600	1,321,100	9,021,600
1943	S.Pen & Aleutian	21,700	2,397,700	90,600	4,360,200	924,500	7,794,700
	North Peninsula	200	567,400	0	1,300	50,400	619,300
	Total	21,900	2,965,100	90,600	4,361,500	974,900	8,414,000
1944	S.Pen & Aleutian	9,900	538,600	238,700	2,653,800	985,600	4,426,600
	North Peninsula	100	414,700	0	2,600	157,900	575,300
	Total	10,000	953,300	238,700	2,656,400	1,143,500	5,001,900
1945	S.Pen & Aleutian	21,400	813,400	116,100	3,639,600	948,900	5,539,400
	North Peninsula	100	394,400	0	2,500	335,100	732,100
	Total	21,500	1,207,800	116,100	3,642,100	1,284,000	6,271,500
1946	S.Pen & Aleutian	6,100	752,300	151,400	1,964,000	1,219,900	4,093,700
	North Peninsula	2,500	697,700	300	0	36,000	736,500
	Total	8,600	1,450,000	151,700	1,964,000	1,255,900	4,830,200
1947	S.Pen & Aleutian	3,400	1,137,100	55,800	2,319,600	1,219,200	4,735,100
	North Peninsula	100	357,700	100	100	75,000	433,000
	Total	3,500	1,491,800	55,900	2,319,700	1,294,200	5,168,100
1948	S.Pen & Aleutian	1,200	285,900	39,200	1,683,700	1,139,600	3,149,600
	North Peninsula	1,200	477,600	17,200	0	161,700	658,700
	Total	3,400	763,500	56,400	1,683,700	1,301,300	3,808,300
1949	S.Pen & Aleutian	3,800	637,500	19,500	1,544,000	560,900	2,765,700
	North Peninsula	700	137,100	25,700	0	40,700	204,200
	Total	4,500	774,600	45,200	1,544,000	601,600	2,969,900
1950	S.Pen & Aleutian	4,000	1,745,300	70,700	1,613,700	562,500	3,996,200
	North Peninsula	1,100	127,800	37,800	0	217,600	284,300
	Total	5,100	1,873,100	108,500	1,613,700	780,100	4,380,500
1951	South Peninsula	1,500	264,200	55,700	2,844,800	683,100	3,849,300
	North Peninsula	1,200	358,900	32,900	20,400	203,000	616,400
	Aleutians	0	11,700	400	500	94,500	107,100
	Total	2700	634,800	89000	2865700	980,600	4,572,800
1952	South Peninsula	9,200	894,500	39,200	908,500	1,040,800	2,892,200
	North Peninsula	700	354,800	54,200	1,400	246,900	658,000
	Aleutian Islands	200	42,800	0	31,800	25,700	100,500
	Total	10,100	1,292,100	93,400	941,700	1,313,400	3,650,700
1953	South Peninsula	7,200	1,039,200	47,900	2,743,900	1,464,600	5,302,800
	North Peninsula	800	537,300	26,200	18,300	224,400	807,000
	Aleutian Islands	0	4,200	500	69,200	800	74,700
	Total	8,000	1,580,700	74,600	2,831,400	1,689,800	6,184,500

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1954	South Peninsula	4,200	636,300	49,400	2,033,300	1,413,400	4,136,600
	North Peninsula	3,400	354,700	35,000	18,500	405,000	816,600
	Aleutian Islands	0	6,300	800	566,500	200	573,800
	Total	7,600	997,300	85,200	2,618,300	1,818,600	5,527,000
1955	South Peninsula	5,400	550,100	44,800	2,529,200	688,200	3,817,700
	North Peninsula	4,100	586,600	6,200	900	129,600	727,400
	Aleutian Islands	0	12,600	100	31,100	400	44,200
	Total	9,500	1,149,300	51,100	2,561,200	818,200	4,589,300
1956	South Peninsula	4,800	641,400	61,900	2,740,700	1,618,700	5,067,500
	North Peninsula	4,200	1,370,900	8,200	28,500	427,400	1,839,200
	Aleutian Islands	0	400	0	33,900	0	34,300
	Total	9,000	2,012,700	70,100	2,803,100	2,046,100	6,941,000
1957	South Peninsula	5,800	341,900	49,900	913,100	1,281,400	2,592,100
	North Peninsula	1,000	327,900	18,300	3,300	274,900	625,400
	Aleutian Islands	2,300	27,300	100	500	13,900	44,100
	Total	9,100	697,100	68,300	916,900	1,570,200	3,261,600
1958	South Peninsula	800	186,100	70,600	1,385,200	841,000	2,483,700
	North Peninsula	15,000	473,800	57,100	60,400	254,800	861,100
	Aleutian Islands	0	300	0	613,200	3,700	617,200
	Total	15,800	660,200	127,700	2,058,800	1,099,500	3,962,000
1959	South Peninsula	900	217,500	8,500	915,600	711,700	1,854,200
	North Peninsula	28,700	634,900	59,100	9,600	404,700	1,137,000
	Aleutian Islands	0	6,100	0	12,000	100	18,200
	Total	29,600	858,500	67,600	937,200	1,116,500	3,009,400
1960	South Peninsula	1,700	379,000	1,800	1,197,500	904,400	2,484,400
	North Peninsula	10,400	692,800	44,000	34,700	607,200	1,389,100
	Aleutian Islands	0	7,600	0	444,900	300	452,800
	Total	12,100	1,079,400	45,800	1,677,100	1,511,900	4,326,300
1961	South Peninsula	900	456,800	10,400	1,727,800	748,600	2,944,500
	North Peninsula	6,100	387,700	24,600	3,000	153,300	574,700
	Aleutian Islands	0	2,700	0	94,000	200	96,900
	Total	7,000	847,200	35,000	1,824,800	902,100	3,616,100
1962	South Peninsula	3,300	420,000	12,500	1,965,500	824,800	3,226,100
	North Peninsula	5,400	249,700	35,200	31,200	34,900	356,400
	Aleutian Islands	0	5,500	100	2,001,700	1,200	2,008,500
	Total	8,700	675,200	47,800	3,998,400	860,900	5,591,000
1963	South Peninsula	1,900	204,400	16,500	2,367,700	461,300	3,051,800
	North Peninsula	3,600	225,200	40,500	6,900	49,900	326,100
	Aleutian Islands	0	4,500	0	93,900	300	98,700
	Total	5,500	434,100	57,000	2,468,500	511,500	3,476,600
1964	South Peninsula	2,000	370,800	13,600	2,740,400	751,000	3,877,800
	North Peninsula	3,600	250,800	36,600	6,800	139,000	436,800
	Aleutian Islands	0	200	0	194,100	2,300	196,600
	Total	5,600	621,800	50,200	2,941,300	892,300	4,511,200

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1965	South Peninsula	2,100	915,700	34,200	2,884,100	556,400	4,392,500
	North Peninsula	6,100	199,500	34,500	2,100	69,700	311,900
	Aleutian Islands	0	0	0	0	0	0
	Total	8,200	1,115,200	68,700	2,886,200	626,100	4,704,400
1966	South Peninsula	1,400	606,200	6,300	302,300	494,400	1,410,600
	North Peninsula	5,600	245,300	37,300	16,000	82,800	387,000
	Aleutian Islands	0	1,000	0	63,500	700	65,200
	Total	7,000	852,500	43,600	381,800	577,900	1,862,800
1967	South Peninsula	1,600	294,100	2,900	77,800	245,200	621,600
	North Peninsula	5,500	224,700	46,800	700	41,300	319,000
	Aleutians	0	200	0	7,900	0	8,100
	Total	7,100	519,000	49,700	86,400	286,500	948,700
1968	South Peninsula	1,400	699,800	31,100	1,287,100	325,300	2,344,700
	North Peninsula	4,500	237,100	64,900	200	73,500	380,200
	Aleutian Islands	0	2,000	100	902,800	800	905,700
	Total	5,900	938,900	96,100	2,190,100	399,600	3,630,600
1969	South Peninsula	1,900	912,800	10,900	1,219,400	389,200	2,534,200
	North Peninsula	4,800	321,300	49,100	100	28,100	403,400
	Aleutian Islands	0	1,900	0	242,200	1,500	245,600
	Total	6,700	1,236,000	60,000	1,461,700	418,800	3,183,200
1970	South Peninsula	1,806	1,779,525	32,571	1,737,985	993,349	4,545,236
	North Peninsula	3,829	187,793	26,327	7,904	47,989	273,842
	Aleutian Islands	6	208	135	644,121	3,029	647,499
	Total	5,644	1,967,526	59,033	2,390,010	1,044,367	5,466,580
1971	South Peninsula	2,174	716,087	16,907	1,445,031	1,365,957	3,546,156
	North Peninsula	2,187	353,784	8,222	297	64,154	428,644
	Aleutian Islands	0	333	2	45,114	58	45,507
	Total	4,361	1,070,204	25,131	1,490,442	1,430,169	4,020,307
1972	South Peninsula	1,332	557,422	8,021	78,221	731,814	1,376,810
	North Peninsula	1,790	179,325	9,684	129	84,687	275,615
	Aleutian Islands	0	69	1	2,784	6	2,860
	Total	3,122	736,816	17,706	81,134	816,507	1,655,285
1973	South Peninsula	415	330,091	6,599	58,051	292,943	688,099
	North Peninsula	2,569	165,388	19,776	143	152,773	340,649
	Aleutian Islands	0	0	0	2,042	0	2,042
	Total	3,042	495,481	26,375	60,236	445,716	1,030,850
1974	South Peninsula	581	197,153	9,366	100,601	71,826	379,527
	North Peninsula	2,710	246,209	16,799	10,599	34,417	310,734
	Aleutian Islands	0	0	0	0	0	0
	Total	3,301	443,362	26,165	111,200	106,243	690,271
1975	South Peninsula	117	243,548	67	60,642	130,750	435,124
	North Peninsula	2,093	233,293	28,349	295	8,770	272,800
	Aleutian Islands	0	19,402	0	659	1,881	21,942
	Total	2,210	496,243	28,422	61,596	141,401	729,872

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1976	South Peninsula	2,196	375,027	216	2,366,833	532,503	3,276,775
	North Peninsula	4,947	641,134	26,061	672	73,589	746,403
	Aleutian Islands	0	0	0	0	0	0
	Total	7,149	1,016,161	26,277	2,367,505	606,092	4,023,184
1977	South Peninsula	559	311,722	2,108	1,448,648	243,167	2,006,204
	North Peninsula	5,489	472,006	34,137	888	129,168	641,688
	Aleutian Islands	0	0	0	0	0	0
	Total	6,048	783,728	36,245	1,449,536	372,335	2,647,892
1978	South Peninsula	773	579,411	60,774	5,590,145	546,182	6,777,285
	North Peninsula	13,524	896,616	63,341	485,224	163,804	1,622,509
	Aleutian Islands	0	1,829	0	38,109	6	39,944
	Total	15,031	1,477,856	124,115	6,113,478	709,992	8,440,472
1979	South Peninsula	2,141	1,149,927	356,867	6,564,914	482,930	8,556,779
	North Peninsula	15,704	1,979,167	112,835	4,994	65,711	2,178,411
	Aleutian Islands	0	12,206	0	539,393	242	551,841
	Total	19,248	3,141,300	469,702	7,109,301	548,883	11,288,434
1980	South Peninsula	4,794	3,613,025	274,181	7,861,470	1,353,112	13,106,582
	North Peninsula	16,627	1,397,118	127,878	301,672	700,196	2,543,491
	Aleutian Islands	2	9,226	2	2,597,461	4,874	2,611,565
	Total	21,601	5,019,370	402,061	10,760,603	2,058,183	18,261,818
1981	South Peninsula	11,182	2,241,513	162,223	5,033,028	1,768,475	9,216,421
	North Peninsula	18,385	1,844,335	155,420	11,217	706,818	2,736,175
	Aleutian Islands	16	5,430	188	302,786	6,553	314,973
	Total	30,073	4,091,278	317,831	5,347,031	2,481,846	12,268,059
1982	South Peninsula	9,845	2,345,981	256,046	6,734,905	2,272,495	11,619,272
	North Peninsula	29,770	1,435,277	238,016	12,321	331,133	2,046,517
	Aleutian Islands	0	2,672	28	1,447,818	6,148	1,456,666
	Total	39,958	3,783,933	494,090	8,195,044	2,609,776	15,122,801
1983	South Peninsula	26,571	2,556,557	127,657	2,827,622	1,704,072	7,242,479
	North Peninsula	29,006	2,090,142	75,138	3,404	348,307	2,545,997
	Aleutian Islands	0	4,405	0	2,005	11,361	17,771
	Total	56,050	4,654,336	202,795	2,833,031	2,064,155	9,810,367
1984[b]	South Peninsula	9,198	2,318,028	310,950	11,589,258	1,654,622	15,882,056
	North Peninsula	22,747	1,734,851	198,582	27,419	796,723	2,780,322
	Aleutian Islands	26	67,163	1,923	2,309,665	32,025	2,410,802
	Total	32,190	4,120,047	511,455	13,926,342	2,483,375	21,073,409
1985	South Peninsula	6,642	2,144,416	172,514	4,431,016	1,348,726	8,103,314
	North Peninsula	23,403	2,596,073	176,118	3,054	666,616	3,465,264
	Aleutian Islands	40	2,750	0	90	14,175	17,055
	Total	30,210	4,743,247	348,632	4,434,160	2,029,532	11,585,781
1986	South Peninsula	5,589	1,223,089	235,854	4,031,487	1,749,651	7,245,670
	North Peninsula	11,735	2,463,734	164,071	22,630	271,216	2,933,386
	Aleutian Islands	11	7,702	60	42,621	38,819	89,213
	Total	17,340	3,694,526	399,985	4,096,738	2,059,686	10,268,275

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1987	South Peninsula	9,174	1,449,753	225,120	1,208,556	1,375,887	4,268,490
	North Peninsula	14,186	1,209,435	171,784	3,486	368,696	1,767,587
	Aleutian Islands	0	75	0	0	0	75
	Total	23,360	2,659,263	396,904	1,212,042	1,744,583	6,036,152
1988	South Peninsula	11,075	1,473,651	505,533	7,044,824	1,908,507	10,943,590
	North Peninsula	16,721	1,528,107	233,966	65,242	393,075	2,237,111
	Aleutian Islands	0	4,315	7	183,109	450	187,881
	Total	27,880	3,006,082	739,506	7,293,175	2,302,034	13,368,677
1989	South Peninsula	7,009	2,659,101	441,397	7,289,130	993,492	11,390,129
	North Peninsula	10,698	1,718,001	227,551	4,103	156,992	2,117,345
	Aleutian Islands	0	8,248	0	6,700	0	14,948
	Total	18,013	4,387,764	671,394	7,303,461	1,151,408	13,532,040
1990	South Peninsula	16,497	2,385,560	305,510	2,861,283	1,234,679	6,803,529
	North Peninsula	12,320	2,416,047	192,978	517,724	126,113	3,265,182
	Aleutian Islands	2	12,435	74	282,823	1,038	296,372
	Total	28,844	4,815,326	500,270	3,666,403	1,364,977	10,375,820
1991	South Peninsula	7,510	2,304,531	313,223	10,596,596	1,573,773	14,795,633
	North Peninsula	9,359	2,931,406	218,274	4,249	191,278	2,814,566
	Aleutian Islands	0	796	0	0	0	796
	Total	17,347	4,712,149	535,403	10,621,005	1,780,078	17,665,982
1992	South Peninsula	7,933	3,438,875	414,948	9,759,657	1,310,337	14,931,750
	North Peninsula	13,136	3,575,507	206,813	194,395	341,616	4,331,467
	Aleutian Islands	0	3,082	0	312,072	1,230	316,384
	Atka-Amlia	0	231	42	7,972	308	8,553
	Total	21,069	7,017,695	621,803	10,274,096	1,653,491	19,588,154
1993	South Peninsula	14,083	3,682,604	215,256	9,925,123	1,046,407	14,883,473
	North Peninsula	22,417	3,866,479	64,376	5,328	134,957	4,093,557
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	24	4	145	563	736
	Total	36,500	7,549,107	279,636	9,930,596	1,181,927	18,977,766
1994	South Peninsula	9,474	2,091,009	251,686	9,143,703	2,178,910	13,674,782
	North Peninsula	18,508	1,783,156	241,913	226,315	83,897	3,353,789
	Aleutian Islands	0	47	6	858,787	617	859,457
	Atka-Amlia	0	16	0	896	0	912
	Total	27,982	3,874,228	493,605	10,229,701	2,263,424	17,888,940
1995	South Peninsula	17,078	2,996,353	260,686	16,302,593	1,715,067	21,291,777
	North Peninsula	7,540	3,272,748	135,639	12,171	99,293	3,527,391
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	24,618	6,269,101	396,325	16,314,764	1,814,360	24,819,168
1996	South Peninsula	5,071	1,528,587	278,191	2,187,239	775,057	4,774,145
	North Peninsula	4,941	1,911,126	157,313	53,842	67,956	2,195,178
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	20	0	20
	Total	10,012	3,439,713	435,504	2,241,101	843,013	6,969,343

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Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
1997	South Peninsula	7,163	2,258,189	112,432	2,303,926	606,254	5,287,964
	North Peninsula	10,352	2,151,010	94,776	50,701	97,380	2,404,219
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	17,515	4,409,199	207,208	2,354,627	703,634	7,692,183
1998	South Peninsula	4,796	2,170,803	154,170	8,040,681	711,526	11,081,976
	North Peninsula	5,288	1,087,552	134,724	34,810	69,516	1,332,530
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	10,084	3,258,355	288,894	8,075,491	781,042	12,414,506
1999	South Peninsula	4,815	2,948,267	192,485	8,443,343	816,966	12,405,876
	North Peninsula	4,886	1,783,804	53,907	4,367	50,120	1,897,084
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	9,701	4,732,071	246,392	8,447,710	867,086	14,302,960
2000	South Peninsula	5,104	1,984,576	257,146	3,549,545	1,055,316	6,851,687
	North Peninsula	3,904	1,968,882	83,655	34,373	93,696	2,184,510
	Aleutian Islands	1	0	59	256,050	0	256,110
	Atka-Amlia	0	0	0	0	0	0
	Total	9,009	3,953,458	340,860	3,839,968	1,149,012	9,292,307
2001	South Peninsula	2,302	607,756	210,899	4,012,057	921,986	5,755,000
	North Peninsula	4,412	1,147,030	22,162	12,469	174,523	1,360,596
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	6,714	1,754,786	233,061	4,024,526	1,096,509	7,115,596
2002	South Peninsula	6,399	1,035,232	202,717	2,170,376	819,030	4,233,754
	North Peninsula	3,852	1,415,872	28,751	21,461	51,040	1,520,976
	Aleutian Islands	0	0	0	0	0	0
	Atka-Amlia	0	0	0	0	0	0
	Total	10,251	2,451,104	231,468	2,191,837	870,070	5,754,730
2003	South Peninsula	2,712	1,054,208	131,097	4,258,274	637,305	6,083,596
	North Peninsula	4,545	1,477,391	53,137	18,624	38,755	1,592,452
	Aleutian Islands	0	0	0	0	0	0
	Atka- Amlia	0	0	0	0	0	0
	Total	7,257	2,531,599	184,234	4,276,898	676,060	7,676,048
2004	South Peninsula	7,050	2,199,944	235,600	6,665,831	790,109	9,898,534
	North Peninsula	10,402	2,433,778	33,920	15,828	14,958	2,508,886
	Aleutian Islands	0	0	0	0	0	0
	Atka- Amlia	0	0	0	0	0	0
	Total	17,452	4,633,722	269,520	6,681,659	805,067	12,407,420
2005	South Peninsula	4,487	2,337,097	143,617	9,416,197	739,460	12,640,858
	North Peninsula	9,198	3,115,807	71,192	3,830	42,539	3,242,566
	Aleutian Islands	0	0	0	0	0	0
	Atka- Amlia	0	0	0	0	0	0
	Total	13,685	5,452,904	214,809	9,420,027	781,999	15,883,424

-continued-

Year		Chinook	Sockeye	Coho	Pink	Chum	Total[a]
2006	South Peninsula	5,412	1,850,029	169,620	4,261,824	1,177,806	7,464,691
	North Peninsula	7,633	2,375,158	93,955	64,207	131,718	2,672,671
	Aleutian Islands	0	2,329	0	991,687	1,534	995,550
	Atka- Amlia	0	0	0	0	0	0
	Total	13,045	4,227,516	263,575	5,317,718	1,311,058	11,132,912
2007	South Peninsula	5,312	2,438,672	150,955	7,299,330	679,787	10,574,056
	North Peninsula	7,609	3,408,818	69,010	137,882	181,009	3,804,328
	Aleutian Islands	0	0	0	1,017,164	0	1,017,164
	Atka- Amlia	0	0	0	0	0	0
	Total	12,921	5,847,490	219,965	8,454,376	860,796	15,395,548
2008	South Peninsula	4,366	2,239,210	225,659	12,710,050	802,404	15,981,689
	North Peninsula	1,799	2,003,906	125,237	21,136	177,364	2,329,442
	Aleutian Islands	1	29	48	784,828	261	785,167
	Atka- Amlia	0	0	0	0	0	0
	Total	6,166	4,243,145	350,944	13,516,014	980,029	19,096,298
1998-2007	South Peninsula	4,839	1,862,658	184,831	5,811,746	834,929	8,699,003
Average	North Peninsula	6,173	2,021,409	64,441	34,785	84,787	2,211,660
	Aleutian Islands	529	233	6	226,490	153	226,882
	Atka-Amlia	0	0	0	0	0	0
	Total	11,541	3,884,301	249,278	6,073,021	919,870	11,138,010

[a] Does not include fish retianed for personal use or test fish catches.

[b] On June 18, 1984 fishermen harvested 23 chinook, 63,929 sockeye,1,900 coho,18,950 pink, and 8,409 chum salmon in Unimak Pass. Unimak Pass was defined as closed to commercial salmon fishing under the Alaska Peninsula portion of the finfish regulations but open to commercial salmon fishing under the Aleutian Islands portion of the finfish regulation book. After 1984, regulations were passed by the Alaska Board of Fisheries closing the Unimak Pass area to commercial salmon fishing until at least July 10.

Considerations for scheduling chum analysis

There are multiple aspects to be considered in developing a time line for the Council's analysis of proposed changes to the management measures for non-Chinook (chum) salmon bycatch in the EBS pollock fishery. These include (but may not be limited to): scope of the analysis (complexity of the Council's alternatives), staff availability due to analysts' respective workloads and timeframe for additional responsibilities, the determination of the appropriate NEPA document (EA versus EIS), outreach on the project (given that this has been recommended by the Council's outreach committee and the salmon bycatch workgroup for further outreach efforts, see also Item C-4(c)), and the timing of implementation of any preferred action by the Council.

At this meeting the Council will be revising its current suite of alternatives for this analysis. At that time the Council may wish to give some consideration to the complexity of the proposed alternatives, based upon lessons learned in conjunction with the Chinook EIS analysis and the need to best understand the specific impacts of the different alternatives.

Given that the current suite of alternatives for the chum management measures analysis is similar in nature to those analyzed under the Chinook EIS and that the analytical framework of this analysis may be similar to the Chinook analysis, there are benefits to retaining much of the analytical staff that was responsible for the Chinook EIS to work on the chum analysis. Keeping the majority of the primary analytical team for the analysis would greatly facilitate the analytical aspects, due to familiarity with the analytical framework, as well as allow for streamlining in documentation based upon lessons learned in the past two years of work on the Chinook EIS document.

However, many of the primary analysts (consisting of analysts from the Alaska Fisheries Science Center (AFSC), NMFS Alaska Regional Office, and Council staff) have scheduling constraints due to other responsibilities. These responsibilities include statutory deadlines for some analyses (meeting ACL requirements for Crab and Scallop FMPs), Council prioritization of deadlines for others, and on-going annual requirements, including, crab rebuilding plan analyses, revising SSL measures, primary authorship on annual stock assessments (including the EBS pollock stock assessment and duties related to primary authorship of that assessment), Plan Team responsibilities, and other staff work responsibilities. Given the nature of these diverse work assignments by primary analysts as well as the scheduling necessary for acquiring and analyzing the data, retaining these staff for the subsequent chum analysis would necessitate a start time for an analysis no sooner than June 2010. Following that timeframe, staff would be available at staggered time periods to begin the primary analytical work required for the analysis. Prior to this time, the Council would have had several meetings to refine alternatives where the SSC will have reviewed and presumably approved the proposed methodology. To the extent possible, partial analyses will be completed for review prior to the full analysis scheduled to begin in the summer of 2010. Staff schedules proposed in this document assumes that the comprehensive analysis of alternatives will begin no sooner than June 2010. This is also concurrent with the proposed availability of updated genetic region of origin bycatch data from the AFSC by June 2010 (see 11/29/09 letter from DeMaster to Olson under Agenda Item B-2).

In addition, based on the response to the outreach efforts made during the Chinook EIS, and the Council formation of a Rural Community Outreach Committee, the outreach component for the chum analysis will be a high priority. Based on recommendations contained in the draft Chum Outreach Plan (see Agenda Item C-4(c)), use of the Federal Subsistence Regional Advisory Council meetings and other annual regional meetings in western Alaska was determined an effective means of conducting rural outreach on this type of initiative. Consideration would thus need to be given to the most effective timing

for conducting an outreach effort (with respect to the timing of the availability of the analysis as well as the time frame for Council decision-making). The schedule for the chum analysis would preferably include rural community outreach, including regional meetings, prior to the Council's selection of a preliminary preferred alternative at initial review.

Finally the Council may wish to consider both the timing and location of Council meetings for decision-making on this analysis as well as the relative time frame for implementation of any management measure following final action by the Council. NMFS staff have indicated that depending upon the complexity of the action, and whether (as anticipated) any chum-related action would be a "B-season" measure for implementation timing, it could take up to 15 months to implement a final rule following Council final action.

Following are two possible schedules for the analysis of management measures for chum salmon bycatch in the Bering Sea pollock fisheries. Both schedules include proposed outreach meetings (in italics). Currently, the NEPA analysis of the proposed action is scheduled to be an environmental assessment, thus, the following tentative schedules are based on this premise, recognizing that it is possible to determine that an EIS is necessary during development of the analysis. It is assumed however that an EIS determination would affect the timing of the analysis after initial review as indicated below (thus would likely delay the timing of Council final action, but would be unlikely to impact the timeframes laid out prior to that). This schedule is also tentative pending Council direction in December 2009 and in the future. The determination that an EIS is necessary, addition of new alternatives, changes to the meeting schedule, and additional outreach meetings, are examples of factors that could alter the schedule.

Tentative schedule for chum analysis, with final action in June 2011:

December 2009:	Council review and refine alternatives; discuss timeline; request for staff assistance/data from ADF&G.
February 2010:	SSC review of methodological approach for analysis and review of available data/discussion of methods for dealing with data limitations.
April 2010:	Not on Council agenda (unless requested).
May 2010	*Proposed community teleconference in order to receive input prior to Council final review of alternatives. Staff presents analytical schedule, Council meeting dates, chum bycatch trend data to-date, current suite of alternatives, and information on how to participate in the Council process.*
June 2010:	Council review and revise alternatives (final opportunity to revise alternative prior to analysis); review of draft subsistence and commercial sections.
October 2010	*Outreach meeting on proposed action (AVCP, Bethel)*
December 2010	*Potential presentation to Yukon River Panel*
June - December 2010:	Preparation of initial review draft (given noted staff workload and timing).
Mid-January 2011:	**Initial review draft available.**
February 2011 (Seattle, WA):	**Council initial review**; Council selection of preliminary preferred alternative (PPA) (the PPA must be within range of alternatives analyzed for this schedule to work).
February/March 2011:	*Rural community outreach meetings on Council initial review draft (and PPA). Potentially seven regional meetings.*
February - April 2011:	Preparation of revised analysis for public review (for Council final action).
May 2011:	Public review draft analysis available.
June 2011 (Nome, AK):	**Council final action**; selection of preferred alternative

Tentative schedule for chum analysis, with final action in Oct 2011:

An alternative schedule is shown below, which schedules Council final action in October 2011 (instead of June 2011). This schedule is also tentative pending Council direction in December 2009 and in the future and as with the previous schedule currently assumes that the NEPA analysis of the proposed action is scheduled to be an environmental assessment. The determination that an EIS is necessary, addition of new alternatives, changes to the meeting schedule, and additional outreach meetings, are examples of factors that could alter the schedule.

December 2009	Council review and refine alternatives; discuss timeline; request for staff assistance/data from ADF&G; review draft outreach plan.
February 2010	SSC review of methodological approach for analysis and review of available data/discussion of methods for dealing with data limitations.
April 2010	Not on Council agenda (unless requested).
May 2010	*Proposed community teleconference in order to receive input prior to Council final review of alternatives. Staff presents analytical schedule, Council meeting dates, chum bycatch trend data to-date, current suite of alternatives, and information on how to participate in the Council process.*
June 2010	**Council review and revise alternatives (final opportunity to revise alternative prior to initial review analysis); review of draft subsistence and commercial sections.**
October 2010	*Outreach meeting on proposed action (AVCP, Bethel)*
December 2010	*Potential presentation to Yukon River Panel*
June - December 2010	Preparation of preliminary review.
Mid-January 2011	Preliminary review draft available.
February 2011 (Seattle, WA)	**Council preliminary review.**
February/March 2011	*Rural community outreach meetings on Council preliminary review draft. Potentially seven regional meetings.*
February - April 2011	Preparation of revised analysis for initial review.
May 2011	Initial review draft analysis available.
June 2011 (Nome, AK)	**Council initial review; review of outreach report; Council selection of preliminary preferred alternative (PPA);** must be within range of alternatives analyzed.
October 2011 (Anch)	**Council final action; selection of preferred alternative.**

Note that the schedule above differs from the first one in that it proposes a preliminary review of the analysis in February 2011, outreach meetings in February/March 2011 as noted above, and initial review and selection of a preliminary preferred alternative (PPA) at the June 2011 meeting in Nome. This would allow several advantages with regard to rural community outreach: input provided at the February/March 2011 community outreach meetings would be available to the Council *prior* to initial review and selection of a PPA; initial review and selection of a PPA would occur in rural Alaska, as opposed to Seattle; and there would be more time between the outreach meetings and Council final action for the public to

provide input. However, the alternative schedule would necessarily delay final action on the analysis until at least October 2011, but would not necessarily affect the implementation date.

AGENDA C-4(b)
Supplemental
DECEMBER 2009

YUKON RIVER DRAINAGE FISHERIES ASSOCIATION

December 1, 2009

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501

Mr. Doug Mecum, Regional Administrator
NOAA Fisheries, Alaska Region
PO Box 21668
Juneau, AK 99802

Re: Agenda Item C-4(b) Chum Salmon Bycatch

Dear Mr. Olson, Mr. Mecum and Council members:

The Yukon River Drainage Fisheries Association (YRDFA) appreciates the opportunity to comment on the issue of chum salmon bycatch. YRDFA is an association of commercial and subsistence fishermen and women on the Yukon River in Alaska with a mission of promoting healthy, wild salmon fisheries on the Yukon River.

Chum salmon are a vital subsistence resource throughout Western Alaska, even more so in these times of Chinook salmon shortages. In formulating the alternatives under consideration by the Council for the forthcoming chum salmon bycatch management measures, it is essential that the Council includes only alternatives which can reasonably be expected to provide bycatch reductions as required under National Standard 9 and protections for Western Alaskan chum salmon. To this end, **we wholeheartedly support the motion passed by the salmon bycatch workgroup which modifies the current suite of alternatives, and urge the Council to move the workgroup's recommendations forward for analysis.**

The range of numbers considered for hard caps and trigger caps under the alternatives is of key importance in the ability of the Council to reduce chum salmon bycatch with this action. The range of cap alternatives in the Council's June 2009 motion is derived from a series of historical averages over various time frames. Two of the averages include only years prior to 2002 in an attempt to reference the obligations under the Yukon River Salmon Agreement, which went into force in that year. The other averages use standard 3, 5 and 10 year time series up to the current year at the time the alternatives were initially formulated at the beginning of this most recent iteration of Chinook and chum salmon bycatch management measures.

Since Chinook and chum measures were bifurcated, the Council now has an opportunity to revise these alternatives. The averages were utilized because they provided a reference point for what historical bycatch levels had been, and therefore what levels of bycatch might be achievable. To this end, these averages should be updated to include the most recent data, through 2009. The cap numbers available will then more accurately reflect recent bycatch experience. This complies with the Council's obligations under National Standard 2 to use the best scientific information available. This is particularly important

725 CHRISTENSEN DRIVE, SUITE 3-B • ANCHORAGE, ALASKA 99501
TELEPHONE: 907-272-3141 • 1-877-99YUKON(9-8566)
FAX: 907-272-3142 • EMAIL:info@yukonsalmon.org
WWW.YUKONSALMON.ORG

given the timetable for completion of this action. With final action contemplated for June 2011, these averages which are outdated now will be severely outdated by the time the Council takes action.

Chum salmon bycatch in the Bering Sea pollock fishery has direct impacts on Western Alaskan stocks. Available data indicates that dependant on location and season, 20-53% of chum salmon are of Western Alaskan origin (Wilmot et. al., 1998). This is a substantial proportion of Western Alaska salmon, particularly in years of high bycatch. The presence of hatchery fish in the chum salmon bycatch along with wild Western Alaska fish does not lessen the urgency of reducing chum salmon bycatch. The Council's obligation is to reduce chum salmon bycatch, and this focus should not be lessened by the presence of hatchery fish. We urge the Council to move forward with effective chum salmon bycatch measures to protect Western Alaska chum salmon stocks by advancing the alternatives as recommended by the workgroup.

Thank you for your continued efforts on this important issue. We look forward to working with you to reduce chum salmon bycatch in the Bering Sea pollock fishery.

Sincerely,

Rebecca Robbins Gisclair
Policy Director

World Wildlife Fund
Kamchatka/Bering Sea Ecoregion
406 G. Street, Suite 303
Anchorage, AK 99501 USA

Tel: (907) 279-5504
Fax: (907) 279-5509

www.worldwildlife.org

December 1, 2009

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 W. 4th Street, Suite 306
Anchorage, AK 99501-2252

Mr. Doug Mecum
Acting Regional Administrator
NOAA Fisheries, Alaska Region
709 W. 9th Street
Juneau, AK 99802-1668

Re: Salmon Bycatch C-4(b)

Dear Mr. Olson and Mr. Mecum,

World Wildlife Fund (WWF) once again appreciates the opportunity to comment on the salmon bycatch reduction measures being considered by the North Pacific Fishery Management Council (Council). We submit this letter in continued support of salmon bycatch reduction efforts in the Bering Sea and Aleutian Islands (BSAI) pollock fisheries. We also maintain our recommendation that the Council take swift action to address the bycatch of non-Chinook (chum) salmon in the BSAI pollock fishery.

It is critically important that the Council consider appropriate and effective ranges for hard caps and trigger caps under the proposed alternatives if the Council intends to meaningfully reduce chum salmon bycatch through this action. The alternatives proposed in the Council's June 2009 motion were developed based on a series of historical averages over various time frames. Two of the previously selected historical averages include only years prior to 2002 in an attempt to reference the obligations under the Yukon River Salmon Agreement. The other selected historical averages use standard, but arbitrary, 3, 5 and 10-year time series up to the current year at the time the Council initially developed the combined proposed alternatives for Chinook and chum salmon bycatch management measures.

Since the Council separated the Chinook and chum measures, the Council now has an opportunity to revise the chum bycatch alternatives. The Council based the previously selected alternatives on historical bycatch levels that implied what levels might be achievable by the pollock fleet. The Council should now update these averages to reflect the most recent data through 2009. Incorporation of this new data more accurately reflects recent bycatch experience and thus, would be more consistent with the National Standard 2 mandate to use the best available scientific information.

WWF wishes to remind the Council that the salmon bycatch issue is one of international importance and consequence. Current stock of origin science indicates that a large proportion of chum salmon captured in the BSAI pollock fishery are of Japanese or Russian origin. Also, speculation remains that a large proportion of this bycatch is from hatchery production. However, these two observations are irrelevant in the context of reducing chum salmon bycatch as a pollock trawl cannot distinguish between an Asian hatchery chum and an Alaskan wild chum. Just because the bycatch may be "diluted" with hatchery fish does not mean we should not take steps to protect vulnerable wild stocks. Without more standardized and regularly analyzed stock of origin data, it would be inappropriate to simply pass off chum

salmon bycatch as inconsequential in light of a perceived high proportion of hatchery or foreign fish. Moreover, because of the international consequence, it is imperative that the Council take its responsibility seriously to simply reduce *all* salmon bycatch, as the action the Council takes will inevitably have reverberations in Russian and Japanese fisheries facing similar challenges.

In conclusion, WWF supports the motion passed by the salmon bycatch workgroup which modifies the current suite of alternatives, and urge the Council to move the workgroup's recommendations forward for analysis. We also continue to recommend the Council consider a precautionary hard cap scenario similar to that selected under the Chinook salmon bycatch measures.

Thank you for your time and consideration of these comments.

Respectfully,

Alfred Lee "Bubba" Cook Jr.
Kamchatka/Bering Sea Ecoregion Senior Fisheries Program Officer
World Wildlife Fund

KAWERAK, INC. ○ P.O. Box 948 ○ Nome, AK 99762
TEL: (907) 443-5231 • FAX: (907) 443-4452

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December 2, 2009

Mr. Eric Olson, Chair
North Pacific Fishery Management Council
605 W. Fourth Avenue, Suite 306
Anchorage, AK 99501-2252

Mr. Doug Mecum, Regional Administrator
NOAA Fisheries, Alaska Region
P.O. Box 21668
Juneau, AK 99802-1668

RE: Chum Salmon Bycatch in the Bering Sea Pollock Fishery

Dear Mr. Olson and Mr. Mecum;

The people of the Bering Strait/Norton Sound region rely upon subsistence resources that they harvest and put away each season. Subsistence foods provide the basis for a healthy diet, and subsistence activities are used to teach our traditions and culture to future generations. We take only what we need to feed our families and share with elders. Salmon is the cornerstone of our subsistence lifestyle, and chum salmon are an essential source of protein in our region.

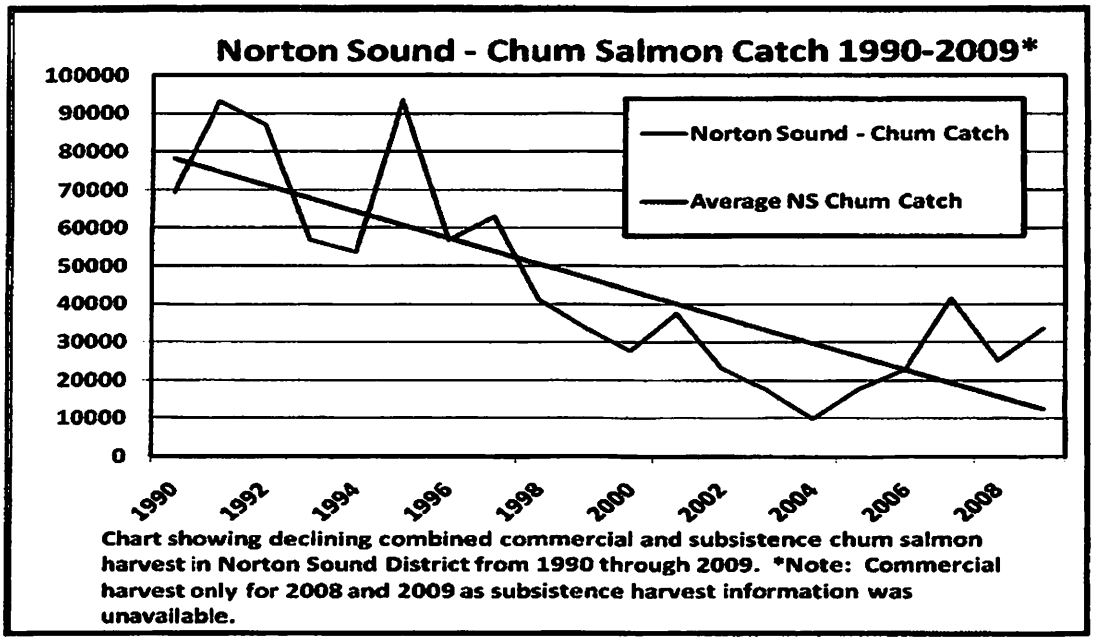

Chart showing declining combined commercial and subsistence chum salmon harvest in Norton Sound District from 1990 through 2009. *Note: Commercial harvest only for 2008 and 2009 as subsistence harvest information was unavailable.

The chum salmon populations in the Norton Sound District are in a serious state of decline, and subsistence fishermen in the Nome Subdistrict have faced the most restrictive regulations in the state due to low abundance of chum salmon. The very low chum salmon returns in 2009 brought back memories of the Norton Sound Fisheries Disaster which occurred just ten years before. Regional ADF&G managers have very limited options available when salmon populations are so depressed, and our subsistence users continue to bear the full burden of chum salmon conservation. Even as our people cope with subsistence restrictions, our salmon populations continue to shrink. The burden of salmon conservation must be shared!

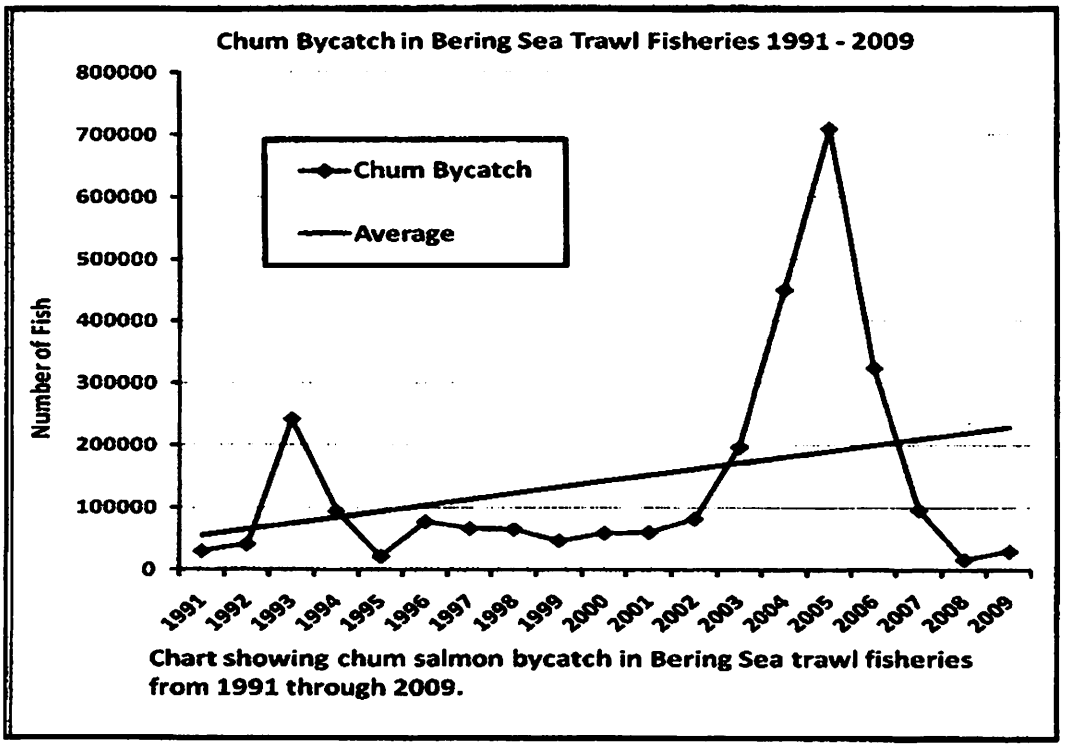

Chart showing chum salmon bycatch in Bering Sea trawl fisheries from 1991 through 2009.

Kawerak supports the motion passed by the salmon bycatch workgroup which modifies the Council's current set of alternatives. We also strongly recommend that the Council ask for analysis of the salmon bycatch workgroup's recommendations. We request the Council to take immediate action to reduce chum salmon bycatch in the Bering Sea pollock fishery. The Council's current preliminary alternatives include one that is so absurdly high that it has only been exceeded once in the history of the pollock fishery! Western Alaska tribes and subsistence users need the Council to consider options that would force the Bering Sea pollock trawlers to take share some of the burden for chum salmon conservation.

Thank you for considering our comments on this important fisheries issue. If you require any additional information, please contact Michael L. Sloan, Fisheries Biologist, at 907-443-4384 or msloan@kawerak.org.

Sincerely,
KAWERAK, INC.

M. Edwardo for LB

Loretta Bullard, President

Nome Fishermen's Association

North Pacific Fishery Management Council
195th Plenary Session
December 9-15, 2009
Anchorage, Hilton Hotel
Testimony of Tim Smith, president
Nome Fishermen's Association

Introduction

My name is Tim Smith

I'm a biologist by training. I received a Master's degree from UAF in 1976

I have been working as a professional on the west coast of Alaska for 35 years; working with fish and wildlife.

I am also a pilot; I have spent about 7,500 hours flying fish and game surveys and radio-tracking instrumented animals mostly on the Seward Peninsula.

I started flying Norton Sound salmon surveys in 1981. I have surveyed all of the salmon spawning rivers on Norton Sound during the past 28 years. I radio-tracked spawning chum and silver salmon fitted with radios in the Fish River system repeatedly during 2002-2006.

Norton Sound salmon runs have been weak for nearly 30 years but the returns during the summer of 2009 in the Nome area were the worst I have seen. I believe high seas interception in pollock trawl fisheries has contributed to the depletion of our salmon stocks and continued trawler bycatch will not only prevent their recovery but may push some of them to extinction if it hasn't already done that.

Message

Norton Sound chum salmon stocks are severely depleted and have been for many years. Commercial salmon fishing in the Nome Area last occurred in 1989; twenty years ago. It may never reopen.

In 1999 we became the only area in the state to have a Tier II fishery. That's where only a few selected subsistence fishermen can fish and everyone else is left sitting on the beach. Last summer, subsistence fishing was essentially closed which created a severe hardship for many people who depend on salmon for food.

I don't think Norton Sound chinook and chum salmon stocks can recover if they continue to be taken in large numbers as bycatch on the high seas. It is impossible to protect weak salmon stocks in mixed stock fisheries. The current biological data don't allow us to quantify the impact of bycatch on specific stocks or to determine the stream of origin of fish caught as bycatch at the level necessary to assess the impact on Norton Sound streams.

The only thing we can do is continue to count fish and document the decline of our salmon populations as some of them are being pushed to extinction and even that is problematic. We can't determine the stock composition of the salmon that return to our streams either and it is probable that many of the fish we count are straying from other areas.

One of the fallacies of fish counting is the assumption that the fish counted are returning to their stream of origin. Most of the data on homing and straying comes from hatchery fish and there is reason to believe that hatchery fish don't home and stray the same way wild fish do. The few studies of wild stocks have found high straying rates. Although there are no data on straying among Norton Sound salmon, I think it is reasonable to believe that fish from some of the strong stocks that migrate through Norton Sound stray into our rivers.

This means that an indigenous salmon stock could become extinct and we would be unable to detect it with the currently available science because salmon straying from other stocks would continue to find their way into our rivers and be counted.

The data suggest that many of the fish that spawn in our rivers are not adapted to the cold temperatures they encounter there. Norton Sound streams are some of the coldest that support salmon egg and fry development. Chum salmon fry trickle out through the summer rather than in a synchronized pulse. That suggests to me that their parents came from rivers having different temperature regimes.

Another problem for restoring Norton Sound salmon stocks and salmon harvesting opportunity is their low recruitment rates and that may be because a large proportion of the spawners we count are poorly adapted to conditions in our rivers.

Small run size combined with weak recruitment and unquantifiable natural mortality factors combined with high seas interception make stock recovery doubtful.

Years ago, we worried about the impact of commercial salmon fisheries at Area M or False Pass on western Alaska chum salmon. Nothing has changed except that now we are aware of large numbers of bycatch in the trawl industry. Area M fishermen continue to intercept Norton Sound salmon and we still don't have any useful data to assess the impact of the combined interception on our weak stocks.

Recommendations

Norton Sound chum and chinook populations are small and vulnerable to overharvesting. Salmon bycatch in the pollock trawl industry must be capped at the lowest level possible and even then it could still be too high to protect our weak stocks.

We should continue efforts to determine stream of origin of fish in the bycatch at a scale that would be meaningful for management.

I realize that's not what the trawl industry wants to hear but it is irresponsible to continue to drive western Alaska salmon stocks, that people have depended upon for generations, to extinction and that is what is happening.

Doing so violates the State of Alaska Constitutional mandate for sustained yield management and the national standards of fishery conservation and management.

C-4(b) Bering Sea Chum Salmon Bycatch Analysis

1:48 12/13/09

Motion

The Council requests staff begin analysis of the following alternatives, to be brought for further review and refinement in June 2010. The below alternatives are from the Council's June 2009 motion as shown throughout the December discussion paper, starting on page 6. Additions are shown underlined and deletions in strikethrough. Additions or deletions that are consistent with Salmon Bycatch Workgroup (SBW) or Advisory Panel (AP) recommendations are marked.

Alternative 1 – Status Quo

Alternative 1 retains the current program of the Chum Salmon Savings Area (SSA) closures triggered by separate non-CDQ and CDQ caps with the fleet's exemption to these closures per regulations for Amendment 84 and as modified by the Amendment 91 Chinook bycatch action.

Alternative 2 – Hard Cap

Component 1: Hard Cap Formulation (with CDQ allocation of 10.7%)

a) ~~58,000~~ 50,000
b) ~~206,000~~ 75,000
c) ~~353,000~~ 125,000
d) ~~488,000~~ 200,000
e) 300,000

Component 2: Sector Allocation

Use blend of CDQ/CDQ partner bycatch numbers for historical average calculations.

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
    1) Pro-rata to pollock AFA pollock sector allocation
    2) Historical average
        i. ~~2004-2006~~ 2007-2009 *[SBW]*
        ii. ~~2002-2006~~ 2005-2009 *[SBW]*
        iii. ~~1997-2006~~ 2000-2009 *[SBW]*
    3) Allocation based on 75% pro-rata and 25% historical
    4) Allocation based on 50% pro-rata and 50% historical
    5) Allocation based on 25% pro-rata and 75% historical
c) Allocate 10.7% to CDQ, remainder divided among other sectors *[SBW]*

1997-2004

Component 3: Sector Transfer

a) No transfers or rollovers
b) Allow NMFS-approved transfers between sectors
    Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
        1) 50%
        2) 70%
        3) 90%

c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Component 4: Cooperative Provision

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.
   Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:
   1) 50%
   2) 70%
   3) 90%

b) Allow NMFS to rollover unused bycatch allocation to inshore cooperatives that are still fishing. *[SBW and AP]*

Alternative 3 – Trigger Closure

Component 1: Trigger Cap Formulation

Cap level

a) ~~45,000~~ 25,000
b) ~~58,000~~ 50,000
c) ~~206,000~~ 75,000
d) ~~353,000~~ 125,000
e) ~~488,000~~ 200,000

Application of Trigger Caps

a) Apply trigger to all chum bycatch
~~b) Apply trigger to all chum bycatch in the CVOA~~
~~c)~~ b) Apply trigger to all chum bycatch between specific dates

Component 2: Sector allocation

Use blend of CDQ/CDQ partner bycatch numbers for historical average calculations.

a) No sector allocation
b) Allocations to Inshore, Catcher Processor, Mothership, and CDQ
   1) Pro-rata to pollock AFA pollock sector allocation
   2) Historical average
      i. ~~2004-2006~~ 2007-2009 [SBW]
      ii. ~~2002-2006~~ 2005-2009 [SBW]
      iii. ~~1997-2006~~ 2000-2009 [SBW]
   3) Allocation based on 75% pro-rata and 25% historical
   4) Allocation based on 50% pro-rata and 50% historical
   5) Allocation based on 25% pro-rata and 75% historical
c) Allocate 10.7% to CDQ, remainder divided among other sectors *[SBW]*

Component 3: Sector Transfer

a) No transfers or rollovers
b) Allow NMFS-approved transfers between sectors

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

1) 50%
2) 70%
3) 90%

c) Allow NMFS to roll-over unused bycatch allocation to sectors that are still fishing

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

1) 50%
2) 70%
3) 90%

Components 4: Cooperative Provisions

a) Allow allocation at the co-op level for the inshore sector, and apply transfer rules (Component 3) at the co-op level for the inshore sector.

Suboption: Limit transfers to the following percentage of salmon that is available to the transferring entity at the time of transfer:

1) 50%
2) 70%
3) 90%

b) Allow NMFS to roll-over unused bycatch allocation to cooperatives that are still fishing *[SBW and AP]*

Component 5: Area Option

a) Area identified in October, 2008 discussion paper (B-season chum bycatch rate-based closure described on pages 14-15 of December 2009 discussion paper)

~~b) Existing Chum Salmon Savings Area (differs from status quo with application of other components)~~

b) New areas [to be identified by staff] which are small, discrete closure areas, each with its own separate cap whereby bycatch in that area only accrues towards the cap *[SBW and AP]*

Component 6: Timing Option – Dates of Area Closure

~~a) Existing closure dates (August 1 – August 31 and September 1 through October 14 if trigger is reached.)~~ *[SBW and AP]*

~~b)~~ New closure dates [to be developed from staff analysis of seasonal proportions of pollock and chum salmon by period across additional ranges of years]

Component 7: Rolling Hot Spot (RHS) Exemption – Similar to status quo, participants in a vessel-level (platform level for Mothership fleet) RHS would be exempt from regulatory triggered closure(s).

a) Sub-option: RHS regulations would contain an ICA provision that the regulatory trigger closure (as adopted in Component 5) apply to participants that do not maintain a certain level of rate-based chum salmon bycatch performance.

PUBLIC TESTIMONY SIGN-UP SHEET +C-4(c) rural outreach

Agenda Item: C-4(b) Chum Salmon Bycatch

	NAME (PLEASE PRINT)	TESTIFYING ON BEHALF OF:
1	John Grouw Glenn Reed	UCB
2	Bubba Cook	WWF
3	Glenn Reed	PSPA
4		
5	Tim Smith	Nome Fishermen's Association
6	Becca Robbins Gisclair	YRDFA
7	Stephen Taufen	Groundswell Fisheries Movement
8	Stephanie Madsen	APA
9	Paul Ryan	BBEDC
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NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person " to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.