

# **BERING SEA SALMON BYCATCH MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT (EIS)**

## **STAFF DISCUSSION PAPER: REVIEW OF DRAFT ALTERNATIVES**

### **OVERVIEW OF INFORMATION PROVIDED FOR APRIL MEETING**

At the April 2008 Council meeting, the Council is scheduled to review and revise the suite of alternatives considered in the draft Bering Sea Salmon Bycatch Management Environmental Impact Statement (EIS). To guide this review, the following staff report describes the alternatives currently under consideration by the Council and provides some preliminary analyses. This draft report will form the basis for Chapter 2: "Description of Alternatives" in the EIS. Also, the scoping report, providing a summary of comments received by NMFS during the scoping period is provided separately.

At the February 2008 Council meeting, the Council directed staff to reorganize the alternatives into separate actions for Chinook salmon (Action 1) and non-Chinook salmon (Action 2) made revisions to the alternatives themselves by changing the range of fishery-level caps under consideration and the methodology for subdividing these caps by sector, and within cooperatives for the inshore catcher vessel sector. The fishery-level caps involve splits by sector and cooperative provisions for straight AFA-sector and CDQ catch percentages as well as percentage break-outs based upon historical catch use by each sector. Also, non-Chinook species caps were recalculated to include only the contribution from the pollock pelagic trawl fishery (previously caps included all gears and target fisheries). Since the February meeting, staff continued to refine the design of area closures for Council consideration. A description of previous area-closure considerations and rationale for the proposed revisions under Council Actions 1 and 2 are provided along with consideration of bycatch rates.

The Council motion from February 2008 is attached to this report as appendix A. The annual and seasonal mortality of salmon by species in pollock pelagic trawl fishery used to calculate the cap levels by species per Council motion in February are attached as Appendix B. These cap levels are included under Action 1: Alternative 2 and Action 2: Alternative 2 in this draft description of alternatives.

Additional information will be provided in the briefing materials for the April Council meeting. To the extent possible, the supplemental documents will include discussions on methods to analyze the status quo alternative, preliminary results from the adult equivalency (AEQ) model, approaches to specify trigger cap levels for proposed area closures, descriptive information on the various rollover and salmon cap transfer provisions, comparisons of alternatives (including flow charts) to assist in the selection of a preliminary preferred alternative, and a draft table of contents of the EIS/RIR/IRFA.

The action before the Council at the April meeting is to review and refine the alternatives as necessary. Pending Council actions in April, an initial review draft of the full analysis is scheduled for June 2008.



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## DRAFT DESCRIPTION OF ALTERNATIVES

The following description provides a detailed overview of the revised alternatives and options for the forthcoming EIS analysis. These restructured alternatives incorporate all refinements through the Council's February 2008 motion. Additional refinements to the alternatives through the April Council meeting will be incorporated into this chapter prior to incorporation in the EIS scheduled for initial review in June 2008. The Council may also formulate different alternatives to be analyzed by selecting aspects of the alternatives as listed below. Section 3.0 of this chapter provides additional information and structure for formulating the Council's preferred alternative. [Note section 3.0 will be provided in the April Council briefing materials]

Separate actions are being considered for Chinook salmon and non-Chinook (primarily chum) salmon in this amendment package. The alternative structure is organized accordingly. In choosing their preferred alternatives, the Council may select different alternatives (and components and options) for each action. Action 1 is for alternatives to manage Chinook salmon while Action 2 is for alternatives to manage non-Chinook salmon. For each action 4 alternatives, including the Status quo are considered. There are two options, A and B which apply to specific alternatives. A detailed description of the components elements and options for each of the 4 alternatives under each action is contained below. The description of the alternative level-options is provided below. Also indicated in conjunction with these alternative-level options are the alternatives for which they apply. The analysis will consider each of these two options as applied to the respective alternatives in conjunction with the impact analysis of all of the components and options for each specific alternative. However, to avoid unnecessary repetition the description of these options is not included under each alternative in the detailed descriptions of specific components and options by Action. It is understood that these may be applied to any of the alternatives for which they are indicated. Further information on the selection of option A or Option B are contained in section 3.0, discussion of comparison of alternatives and selection of preliminary preferred alternative.

### **Action 1: Chinook salmon**

- Alternative 1: Status Quo**
- Alternative 2: Hard cap**
- Alternative 3: Fixed closures**
- Alternative 4: Triggered closures**

#### **Option A (applies to Alternatives 2 and 4):**

**Modify the PSC accounting period to begin at the start of the B season in one calendar year and continue through the A season of the following calendar year. If this option is not selected, the accounting period is the calendar year.**

#### **Option B (applies to Alternatives 3 and 4 only):**

**Exempt those vessels participating in a VRHS system from area closures**

### **Action 2: Non-Chinook salmon (Chum)**

- Alternative 1: Status Quo**
- Alternative 2: Hard cap**
- Alternative 3: Fixed closures**
- Alternative 4: Triggered closures**

**Option A (applies to Alternatives 2 and 4):**

**Modify the PSC accounting period to begin at the start of the B season in one calendar year and continue through the A season of the following calendar year. If this option is not selected, the accounting period is the calendar year.**

**Option B (applies to Alternatives 3 and 4 only):**

**Exempt those vessels participating in a VRHS system from area closures**

Additional components and options are included under individual alternatives are presented. The ranges of caps under consideration by species (Alternative 2) as well as the sector and cooperative level break-outs are detailed. Per Council motion (February 2008), the impact analysis of implementing a specific cap level will be based on a subset of the range as indicated in the tables under for each component and option. The Council may select any cap levels included in the range of alternatives in choosing its preferred alternative.

Note that these alternatives are not intended to be mutually exclusive and the Council may choose to select elements from each of the alternatives together to formulate their preferred alternative (see section 3.0). Under the description of each alternative below, information is provided on the specific elements and options to the alternatives (for alternatives 2-4) as well as how the CDQ program would be treated under that alternative.

**Description of Option A: Modify the PSC Accounting Period**

This option applies to cap alternatives under Action 1 (Chinook) and Action 2 (Chum) for both hard cap alternatives (alternative 2) and Trigger cap alternatives (Alternative 4). The selection of this option would modify the accounting year for the salmon biological year. This means that the accounting system for salmon species would begin in the B season and continue through the A season, i.e. accounting would begin in June and continue through May. The intention of this option is that it more closely tracks the salmon biological year whereby juvenile salmon (those primarily taken as bycatch) likely enter the Bering Sea in the fall to feed and remain on the grounds throughout the winter. This group then migrates to other locations during the summer months prior to beginning their return to the natal streams (those that are of spawning age) in the summer. Thus, the same cohort of salmon that are being caught in the B season remain on the grounds in the A season and any closure potentially triggered by high B season Chinook catch would protect the same age class of salmon from additional impacts in the A season. This is in contrast to the current accounting system whereby the catch accounting for salmon begins January 1 and tracks through December 31<sup>st</sup>. A closure which is triggered due to high rates of catch following the A season is then actually protecting a different cohort of salmon in the B season from those that triggered the need for protection following the A season.

**Description of Option B: Exemption for participation in VRHS system**

This option applies to the area closure alternatives under Action 1 (Chinook) and Action 2 (non-Chinook) for Alternative 3 (Fixed closures) and Alternative 4 (Triggered closures). The selection of this option in conjunction with new area closures would indicate that pollock cooperatives and CDQ groups who participate in a voluntary rolling "hot spot" (VRHS) closure system to avoid salmon bycatch will be granted an exemption to closures. Cooperatives or other vessels which are not participating in a VRHS system will be subject to the new area closures if triggered or fixed.



## **1.0 ACTION 1: CHINOOK SALMON**

### **1.1 Alternative 1: Status Quo (Chinook)**

Alternative 1 retains the current program of Chinook 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.

For Chinook salmon, the Chinook Salmon Savings Areas were established under BSAI Amendment 21b and revised under BSAI Amendment 58. These areas close to pollock trawling if 29,000<sup>1</sup> Chinook salmon are taken. The timing of the closure depends upon when the limit is reached:

1. If the limit is triggered before April 15, the areas close immediately through April 15. After April 15, the areas re-open, but are again closed from September 1-December 31.
2. If the limit is reached after April 15, but before September 1, the areas would close on September 1 through the end of the year.
3. If the limit is reached after September 1, the areas close immediately through the end of the year.

BSAI amendment 58 modified the initial Chinook salmon savings area measures (established under amendment 21b, ADF&G 1995a). Modifications from this amendment in 1999 included: a reduced Chinook limit from 48,000 to 29,000 over a four year period, year-round accounting of Chinook bycatch in the pollock fishery beginning on January 1 of each year, revised boundaries of the savings area closures, and new closure dates. The initial Chinook Salmon Savings Areas included an area south of the Pribilof Islands. This area was removed as a savings area under amendment 58 (NMFS 1999). The revision to the closure dates under this amendment specified the additional closure from September 1-December 31 under the conditions listed in bullets 1-3 above.

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 (NPFMC 2005). The VRHS enables participants in the pollock fisheries to be responsive to current bycatch rates and fish in areas with relatively lower salmon bycatch rates, rather than rely on static closure areas that were established based on historical bycatch rates.

Under this alternative, the CDQ Program would continue to receive allocations of 7.5 percent of the BS and AI Chinook salmon PSC limits and 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 (Chinook)**

This alternative would establish a Chinook salmon bycatch cap on the pollock fishery upon attainment of which all directed pollock fishing would cease. Only those Chinook caught by the pollock fleet would accrue towards the cap and the cap applies only to the pollock fleet when triggered. Several different means of managing this hard cap are provided under this alternative; at the fishery level (single hard cap for the entire pollock fishery); at the sector level (each of the 4 sectors including CDQ receives a sector-

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<sup>1</sup> This number is inclusive of the allocation to CDQ groups. Non-CDQ Chinook salmon limit is 26,825.

specific cap) and at the cooperative level (whereby the sector-level cap for the shore-based CV fleet is further subdivided and managed at the individual cooperative level).

If applied as a single hard cap to all combined sectors, the CDQ Program would receive allocations of 7.5% of any hard cap established for Chinook salmon in the BS. These PSQ reserves would be further allocated among the six CDQ groups based on percentage allocations approved by NMFS on August 8, 2005. Each CDQ group would be prohibited from exceeding its salmon PSQ allocation. This prohibition would require the CDQ group to stop directed fishing for pollock CDQ once its PSQ allocation is reached because further directed fishing for pollock likely would result in exceeding its PSQ allocation.

If the hard cap is subdivided, two options are provided (under component 2) for the allocation to the CDQ program.

### 1.2.1 Component 1: Hard Cap Formulation

Component 1 establishes the hard cap number by two methodologies, option 1 based upon averages of historical numbers and other considerations as noted below and option 2 which uses a modeling methodology to establish a framework for periodically setting the cap based upon salmon returns. Component 1 sets the formulation for the overall cap which 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).

#### 1.2.1.1 Option 1: Range of numbers for hard cap formulation

A range of numbers is established for consideration as hard caps for Chinook salmon. Table 1 lists the numbers in numerical order highest to lowest for overall caps. Here the CDQ allocation of the cap is 7.5% of the total cap, with the remainder for the combined non-CDQ fishery.

**Table 1 Range of suboptions for hard cap with breakout for CDQ allocation (7.5%) and remainder for non-CDQ fleet**

Sub Option	Overall Fishery cap #s Chinook	CDQ allocation	Non-CDQ cap (all sectors combined)
i)	87,500	6,563	80,938
ii)	68,392	5,129	63,263
iii)	57,333	4,300	53,033
iv)	47,591	3,569	44,022
v)	43,328	3,250	40,078
vi)	38,891	2,917	35,974
vii)	32,482	2,436	30,046
viii)	29,323	2,199	27,124

The following section provides the rationale (by suboption number) for each cap number listed in Table 1. Suboption i) 87,500 Chinook salmon represents the upper end of the recent range of observations for Chinook bycatch in the BSAI fishery Incidental Take Statement (ITS)(NMFS 1-11-07 supplemental Biological Opinion). An ITS specifies the expected take of an ESA listed species for the activity consulted on. This amount is related to the ESA consultation on the incidental catch of ESA-listed salmonids in the BSAI groundfish trawl fisheries. None of the ESA-listed salmonids are from Western Alaskan stocks. Additional information on the listed stocks, their relative contribution in the overall bycatch of Chinook salmon in the BSAI groundfish fisheries and the ESA consultation are covered in specific chapter on ESA listed species.

Suboptions ii-vi refer to average bycatch numbers by the pollock pelagic trawl fishery over a range of historical year combinations from 1997 through 2006, dropping some years over the period under consideration in some options. Suboption ii) is the three year average from 2004-2006; iii) is the 5 year average (2002-2006); iv) is the 10 year average (1997-2006) with the lowest year (2000) dropped from the years over which average occurred due to the injunction on the fishery in that year. Suboption v) is the straight 10 year average (including all years 1997-2006), while vi) is the average over those 10 years (1997-2006) dropping the highest year of bycatch (2006) for contrast against the 10 year average minus the lowest year under consideration in suboption iv).

The final two suboptions under consideration (representing the low end of the range of caps considered) represent the 5 year average from 1997-2001 (suboption vii) and the 10 year average 1992-2001 (suboption viii). These year combinations were 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). Additional information on the Yukon River Agreement and the Pacific Salmon Treaty itself are contained in Chapter 1.

For analytical purposes the following range of numbers will be utilized to analyze the impacts of managing the pollock fishery under any of these cap levels (Table 2).

**Table 2 Range of Chinook salmon caps for use in the analysis of impacts**

	Chinook	CDQ	Non-CDQ
i)	87,500	6,563	80,938
ii)	68,100	5,108	62,993
iii)	48,700	3,653	45,048
iv)	29,300	2,198	27,103

#### **1.2.1.1.1 Suboption: Periodic adjustments to cap based on updated bycatch information.**

The Council would reassess updated salmon bycatch information after a certain number of years and determine if adjustments to the hard cap implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

#### **1.2.1.2 Option 2: Framework Cap (cap set relative to salmon returns):**

Caps under this option will be based on analysis by species and involve consideration of run-size impacts. Since this approach involves a number of uncertain components (e.g., river-of-origin, ocean survival, future expected run-size) the cap will be derived from estimated probabilities that account for this uncertainty. This option provides a framework so that the cap regulation could be modified as scientific information improves. Such changes in the cap are envisioned on a periodic basis (say every 2-5 years) as data and input variables critical to the model calculations improve and merit revisions to cap levels. Variables and data that are likely to change with improved scientific information include river of origin information on the stock composition of bycatch samples, stock size estimates by river system, and age-specific survival of salmon returning to individual river systems.

The developed modeling methods are designed to account uncertainty due to both natural variability and observation (measurement) errors. The cap formula would be based on the selection of an acceptable impact level (at specified probability) for a set of rivers or systems. This impact level can then be used to back-calculate the cap level. For example, a framework for this option might be to establish a cap that has only a 10% probability of exceeding a 10% impact level to a particular run. The impact measure relates the historical bycatch levels relative to the subsequent returning salmon run  $k$  in year  $t$ :

$$u_{t,k} = \frac{C_{t,k}}{C_{t,k} + S_{t,k}}$$

where  $C_{t,k}$  and  $S_{t,k}$  are the bycatch and stock size estimates of Chinook salmon. The calculation of  $C_{t,k}$  includes the bycatch of salmon returning to spawn in year  $t$  and the bycatch from previous years of the same cohort (i.e., at younger, immature ages). This latter component needs to be decremented by highly uncertain ocean survival rates. Additionally, uncertainty on age-assignments and river-of-origin, as well as uncertainty of run-size impact these values. A complete description of the model, estimation procedure, and input values are detailed in Appendix X [Placeholder for appendix documentation]

A policy decision is required in specifying an acceptable (probability based) run-size impact level by river system in order to calculate a corresponding salmon bycatch cap level. For regulatory purposes, the adopted procedure must be based on objective criteria and may not be discretionary in nature. Clearly, the probability of an acceptable run size impact level is discretionary and therefore must be an approved fixed value that can vary only with completely revised analyses. The value is thus a policy decision before the Council. Other non-discretionary aspects of the approach may be modified as information improves following standard scientific guidelines and review by the SSC. For the present analysis, a range of impact levels and corresponding cap levels are provided to the Council for consideration and comparison with the fixed value cap levels specified under option 1.

### 1.2.2 Component 2: Sector Allocation

Under this component the hard cap is managed at the sector level for the fishery. This entails separate sector level caps for the CDQ sector, the shoreside 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 specified for that sector, a fishery closure would occur for 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, options 1 and 2. However using each of those options (and suboptions) for cap formulation, the cap is then subdivided into sector level caps according to the following formulas:

Divide the final cap by sectors based on:

**Option 1)** 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 is intended to follow 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, option 1. Note that here the CDQ allocation of salmon is higher than under status quo (10% rather than 5%).

**Table 3 Sector split caps resulting from option 1 percentage allocation: 10% CDQ and the remaining 90% divided 50% inshore CV fleet; 10% for the mothership fleet; and 40% for the offshore CP fleet**

**Option 1) Sector level caps**

Sub Option	Fishery cap #s Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	87,500	8,750	39,375	7,875	31,500
ii)	68,392	6,839	30,776	6,155	24,621
iii)	57,333	5,733	25,800	5,160	20,640
iv)	47,591	4,759	21,416	4,283	17,133
v)	43,328	4,333	19,498	3,900	15,598
vi)	38,891	3,889	17,501	3,500	14,001
vii)	32,482	3,248	14,617	2,923	11,694
viii)	29,323	2,932	13,195	2,639	10,556

For analytical purposes the following ranges will be utilized (Table 4 ):

**Table 4 Range of Sector level Chinook salmon caps for use in the analysis of impacts**

	Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	87,500	8,750	39,375	7,875	31,500
ii)	68,100	6,810	30,645	6,129	24,516
iii)	48,700	4,870	21,915	4,383	17,532
iv)	29,300	2,930	13,185	2,637	10,548

**Option 2) Historical average of percent bycatch by sector based on:**

- a) 3 year (2004-2006) average: CDQ 3%; inshore CV fleet 70%; mothership fleet 6%; offshore CP fleet 21%.
- b) 5 year (2002-2006) average: CDQ 4%; inshore CV fleet 65%; mothership fleet 7%; offshore CP fleet 24%.
- c) 10 year (1997-2006) average: CDQ 4%; inshore CV fleet 62%; mothership fleet 9%; offshore CP fleet 25%.

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. Similar to the years considered for the overall cap formulation, the historical years do not consider the most recent (and historical high) of 2007.

**Option 2a** uses the historical averages of percent bycatch by sector from the most recent time period under consideration in this analysis (2004-2006). This results in the following average percentages by sector: CDQ 3%; inshore CV fleet 70%; mothership fleet 6%; offshore CP fleet 21%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 5 )

**Table 5 Sector level caps based upon historical average percent bycatch from 2004-2006 (option 2a)****Option 2a)****Sector level caps (2004-2006 average historical bycatch)**

Sub Option	Fishery cap #s Chinook	CDQ 3%	Inshore CV 70%	Mothership 6%	Offshore CPs 21%
i)	87,500	2,625	61,250	5,250	18,375
ii)	68,392	2,052	47,874	4,104	14,362
iii)	57,333	1,720	40,133	3,440	12,040
iv)	47,591	1,428	33,314	2,855	9,994
v)	43,328	1,300	30,330	2,600	9,099
vi)	38,891	1,167	27,224	2,333	8,167
vii)	32,482	974	22,737	1,949	6,821
viii)	29,323	880	20,526	1,759	6,158

For analytical purposes the following range of sector split caps is shown in Table 6:

**Table 6 Range of Sector level Chinook salmon caps (option 2a) for use in the analysis of impacts**

	Fishery cap #s Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	87,500	2,625	61,250	5,250	18,375
ii)	68,100	2,043	47,670	4,086	14,301
iii)	48,700	1,461	34,090	2,922	10,227
iv)	29,300	879	20,510	1,758	6,153

Option 2b considers the historical averages of percent bycatch by sector from the 5 year time period (2002-2006). This results in the following average percentages by sector: CDQ 4%; inshore CV fleet 65%; mothership fleet 7%; offshore CP fleet 24%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 7)

**Table 7 Sector level caps based upon historical average percent bycatch from 2002-2006 (option 2b)****Option 2b)****Sector level caps (2002-2006 average historical bycatch)**

Sub Option	Fishery cap #s Chinook	CDQ 4%	Inshore CV 65%	Mothership 7%	Offshore CPs 24%
i)	87,500	3,500	56,875	6,125	21,000
ii)	68,392	2,736	44,455	4,787	16,414
iii)	57,333	2,293	37,266	4,013	13,760
iv)	47,591	1,904	30,934	3,331	11,422
v)	43,328	1,733	28,163	3,033	10,399
vi)	38,891	1,556	25,279	2,722	9,334
vii)	32,482	1,299	21,113	2,274	7,796
viii)	29,323	1,173	19,060	2,053	7,038

For analytical purposes the following range of sector split caps for this option are shown in Table 8.

**Table 8 Range of Sector level Chinook salmon caps (option 2b) for use in the analysis of impacts**

	Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	87,500	3,500	56,875	6,125	21,000
ii)	68,100	2,724	44,265	4,767	16,344
iii)	48,700	1,948	31,655	3,409	11,688
iv)	29,300	1,172	19,045	2,051	7,032

Option 2c considers the historical averages of percent bycatch by sector from the 10 year time period (1997-2006). This results in the following average percentages by sector: CDQ 4%; inshore CV fleet 62%; mothership fleet 9%; offshore CP fleet 25%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 9).

**Table 9 Sector level caps based upon historical average percent bycatch from 2002-2006 (option 2b)**

### Option 2c)

#### Sector level caps (1997-2006 average historical bycatch)

Sub Option	Fishery cap #s	CDQ	Inshore CV	Mothership	Offshore CPs
	Chinook	4%	62%	9%	25%
i)	87,500	3,500	54,250	7,875	21,875
ii)	68,392	2,736	42,403	6,155	17,098
iii)	57,333	2,293	35,546	5,160	14,333
iv)	47,591	1,904	29,506	4,283	11,898
v)	43,328	1,733	26,863	3,900	10,832
vi)	38,891	1,556	24,112	3,500	9,723
vii)	32,482	1,299	20,139	2,923	8,121
viii)	29,323	1,173	18,180	2,639	7,331

For analytical purposes the following range of sector split caps for this option will be utilized (Table 10):

**Table 10 Range of Sector level Chinook salmon caps (option 2c) for use in the analysis of impacts**

	Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	87,500	3,500	54,250	7,875	21,875
ii)	68,100	2,724	42,222	6,129	17,025
iii)	48,700	1,948	30,194	4,383	12,175
iv)	29,300	1,172	18,166	2,637	7,325

### 1.2.3 Component 3: Sector Transfer

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

**Option 2)** NMFS would rollover unused salmon bycatch to other sectors and other cooperatives still fishing

[placeholder for description of this component]

### 1.2.4 Component 4: Cooperative provisions

These provisions apply for the in-shore catcher vessels cooperatives. Each cooperative would receive a salmon allocation managed at the cooperative level. In order to allow for effective monitoring and management requirements, except for catcher vessels that deliver unsorted cod ends, participation in the pollock fishery for vessels would require a minimum of 100% observer coverage or video monitoring to

ensure no at-sea discards. If the cooperative salmon cap is reached, the cooperative must stop fishing for pollock.

The initial allocation of salmon by cooperative within the shore-based CV fleet is based upon the percent of total sector pollock catch their co-op allocation represents. The annual pollock quota for this fleet is divided up based upon application of a formula in the regulations for catch by cooperative per the specific sum of the catch history of the vessels the cooperative represents. Under 679.62(e)(1), the individual catch history of each vessel is equal to the vessel's best 2 of 3 years inshore pollock landings from 1995 through 1997 and includes landings to catcher/processors for vessels that made 500 or more mt landings to catcher/processors from 1995 through 1997. Each year fishing permits are issued by cooperative with 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 the open access allocation under these circumstances.

The range of cooperative level allocations are based upon the 2008 pollock quota allocations and the options for the range of sector splits for the shore-based CV fleet based upon component 2, options 1 and 2 applied to component 1 options 1 and 2 (Table 11 to Table 14). For analytical purposes, the range of cooperative allocations will be analyzed using the ranges as indicated in Table 15 and Table 16.



**Table 11 Inshore cooperative allocations resulting from application of component 2, option 1 allocation to the inshore CV fleet (50% of allocation after 10% to CDQ)**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation*	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	87,500	39,375	12,263	451	3,733	1,132	4,800	9,551	7,444	0
ii)	68,392	30,776	9,585	353	2,918	885	3,752	7,465	5,819	0
iii)	57,333	25,800	8,035	296	2,446	742	3,145	6,258	4,878	0
iv)	47,591	21,416	6,670	245	2,030	616	2,611	5,195	4,049	0
v)	43,328	19,498	6,073	223	1,849	561	2,377	4,729	3,686	0
vi)	38,891	17,501	5,451	201	1,659	503	2,134	4,245	3,309	0
vii)	32,482	14,617	4,552	168	1,386	420	1,782	3,545	2,763	0
viii)	29,323	13,195	4,110	151	1,251	379	1,609	3,201	2,495	0

\*(50% CV after CDQ)

**Table 12 Inshore cooperative allocations resulting from application of component 2, option 2a allocation to the inshore CV fleet (average historical bycatch from 2004-2006)**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation*	Inshore cooperative allocation:								open access AFA vessels
			31.145%	1.146%	9.481%	2.876%	12.191%	24.256%	18.906%	0.000%	
			Akutan CV Assoc	Arctic Enterprise Assoc	Northern Victor Fleet coop	Peter Pan Fleet coop	Unalaska coop	Unisea Fleet coop	Westward Fleet coop		
i)	87,500	61,250	19,076	702	5,807	1,762	7,467	14,857	11,580	0	
ii)	68,392	47,874	14,910	549	4,539	1,377	5,836	11,612	9,051	0	
iii)	57,333	40,133	12,499	460	3,805	1,154	4,893	9,735	7,588	0	
iv)	47,591	33,314	10,376	382	3,158	958	4,061	8,081	6,298	0	
v)	43,328	30,330	9,446	348	2,876	872	3,697	7,357	5,734	0	
vi)	38,891	27,224	8,479	312	2,581	783	3,319	6,603	5,147	0	
vii)	32,482	22,737	7,082	261	2,156	654	2,772	5,515	4,299	0	
viii)	29,323	20,526	6,393	235	1,946	590	2,502	4,979	3,881	0	

\*(70% based on 3 year average 2004-2006)

**Table 13 Inshore cooperative allocations resulting from application of component 2, option 2b allocation to the inshore CV fleet (average historical bycatch from 2002-2006)**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation*	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	87,500	56,875	17,714	652	5,392	1,636	6,934	13,796	10,753	0
ii)	68,392	44,455	13,845	509	4,215	1,279	5,419	10,783	8,405	0
iii)	57,333	37,266	11,607	427	3,533	1,072	4,543	9,039	7,046	0
iv)	47,591	30,934	9,634	355	2,933	890	3,771	7,503	5,848	0
v)	43,328	28,163	8,771	323	2,670	810	3,433	6,831	5,325	0
vi)	38,891	25,279	7,873	290	2,397	727	3,082	6,132	4,779	0
vii)	32,482	21,113	6,576	242	2,002	607	2,574	5,121	3,992	0
viii)	29,323	19,060	5,936	218	1,807	548	2,324	4,623	3,603	0

\*(65% based on 5 year average 2002-2006)

**Table 14 Inshore cooperative allocations resulting from application of component 2, option 2c allocation to the inshore CV fleet (average historical bycatch from 1997-2006)**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation*	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA sels
i)	87,500	54,250	16,896	622	5,143	1,560	6,614	13,159	10,257	0
ii)	68,392	42,403	13,206	486	4,020	1,220	5,169	10,285	8,017	0
iii)	57,333	35,546	11,071	407	3,370	1,022	4,333	8,622	6,720	0
iv)	47,591	29,506	9,190	338	2,798	849	3,597	7,157	5,578	0
v)	43,328	26,863	8,367	308	2,547	773	3,275	6,516	5,079	0
vi)	38,891	24,112	7,510	276	2,286	693	2,940	5,849	4,559	0
vii)	32,482	20,139	6,272	231	1,909	579	2,455	4,885	3,807	0
viii)	29,323	18,180	5,662	208	1,724	523	2,216	4,410	3,437	0

\*62% based on 10 year average 1997-2006

**Table 15 Cap ranges for analysis of hard cap component 2, option 1 for component 4, cooperative provisions**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	87,500	39,375	12,263	451	3,733	1,132	4,800	9,551	7,444	0
ii)	68,100	30,645	9,544	351	2,905	881	3,736	7,433	5,794	0
iii)	48,700	21,915	6,825	251	2,078	630	2,672	5,316	4,143	0
iv)	29,300	13,185	4,106	151	1,250	379	1,607	3,198	2,493	0

**Table 16 Cap ranges for analysis of hard cap component 2, option 2 (a-c) for component 4 cooperative provisions**

Cap Suboption	Overall fishery cap level Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
2a(i)	87,500	61,250	19,076	702	5,807	1,762	7,467	14,857	11,580	0
2a(ii)	68,100	47,670	14,847	546	4,520	1,371	5,811	11,563	9,012	0
2a(iii)	48,700	34,090	10,617	391	3,232	980	4,156	8,269	6,445	0
2a(iv)	29,300	20,510	6,388	235	1,945	590	2,500	4,975	3,878	0
2b(i)	87,500	56,875	17,714	652	5,392	1,636	6,934	13,796	10,753	0
2b(ii)	68,100	44,265	13,786	507	4,197	1,273	5,396	10,737	8,369	0
2b(iii)	48,700	31,655	9,859	363	3,001	910	3,859	7,678	5,985	0
2b(iv)	29,300	19,045	5,932	218	1,806	548	2,322	4,620	3,601	0
2c(i)	87,500	54,250	16,896	622	5,143	1,560	6,614	13,159	10,257	0
2c(ii)	68,100	42,222	13,150	484	4,003	1,214	5,147	10,241	7,982	0
2c(iii)	48,700	30,194	9,404	346	2,863	868	3,681	7,324	5,708	0
2c(iv)	29,300	18,166	5,658	208	1,722	522	2,215	4,406	3,434	0

### 1.2.4.1 Cooperative transfer options

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

**Option 1)** Lease their remaining pollock to another coop (inter-cooperative transfer) within their sector for that year (or similar method to allow pollock harvest with individual coop accountability)

[placeholder for NOAA GC description of specific provisions under which this can apply]

**Option 2)** Transfer salmon bycatch from other inshore cooperatives

[placeholder for inserting information on how cooperative transfers]

**Rollover suboption:** NMFS will rollover unused salmon bycatch to other sectors and inshore cooperatives still fishing [pull from component 3 option 2 discussion]

## 1.3 Alternative 3: Fixed closures (Chinook)

Fixed closure management measures are pre-defined regulatory times and areas where pelagic pollock trawling would be prohibited.

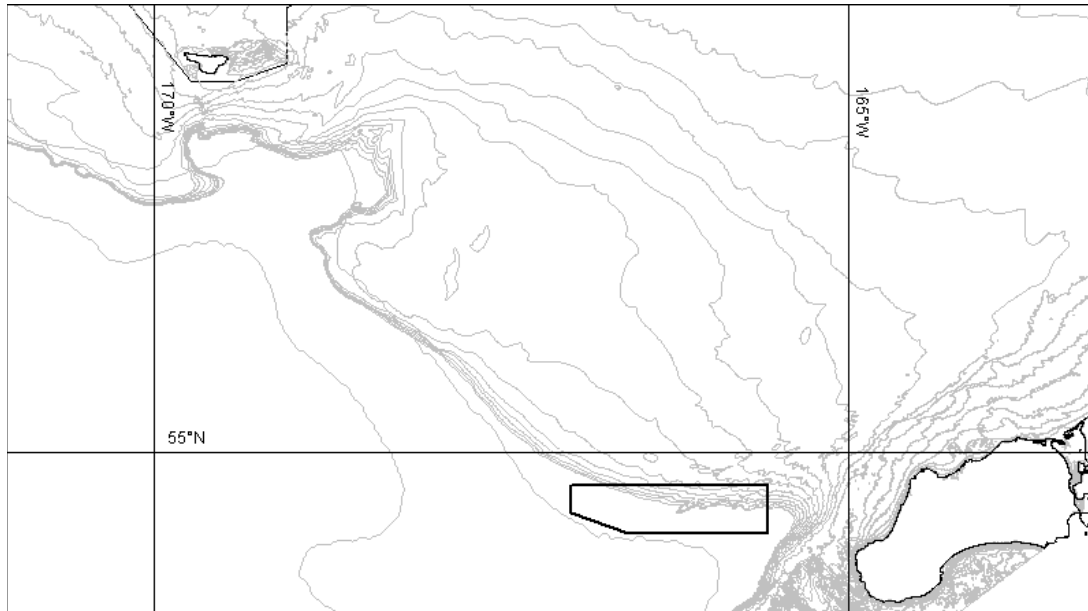
The CDQ groups would be required to comply with any fixed closures that were established to reduce salmon bycatch. This alternative does not include salmon bycatch PSC limits or allocations to the CDQ Program or among the CDQ groups.

Note per discussion and preliminary analysis below by option, staff has the following recommendations for fixed area closure option revisions.

### Staff recommendations for revised Alternative 1.3 components:

#### 1.3.1 Component 1: A season

One fixed closure option is proposed for the A season. This closure option was brought forward to the Council in February 2008 in conjunction with the industry's adoption of this closure region as a salmon savings conservation area under the 2008 ICA agreement.



**Figure 1 Fixed A season closure for Chinook (termed ICA for inter-cooperative agreement conservation area).**

The coordinates of the A season closure option are as follows (Table 17):

**Table 17 A season fixed closure coordinates**

55° 0'	166° 30'	56° 8'	170° 0'
55° 0'	165° 30'	56° 8'	168° 15'
55° 53'	165° 30'	56° 8'	168° 0'
55° 53'	165° 0'	55° 30'	166° 0'
54° 45'	165° 0'	55° 30'	165° 30'
54° 15'	165° 15'	56° 30'	165° 30'
54° 30'	166° 30'	56° 30'	170° 0'
56° 0'	169° 15'	56° 8'	170° 0'
56° 0'	168° 15'		
55° 0'	166° 30'		

This duration of this closure would be for the entire A season. Table 18 below shows the relative seasonal pollock catch as compared to the overall Chinook catch in the A season as well as the break-outs by week within this area and outside of it. This closure is a very small defined area with relatively limited pollock catch effort by week and occasionally high rates of Chinook catch.

**Table 18 A season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook and effort observed inside of proposed area based on 2004-2006 NMFS observer data broken out by week.**

Period	Closure	Rate In	Rate Outside	Pollock inside	Chinook inside	Effort inside
A-season	ICA	0.752	0.057	1%	8%	1%
Jan 20-25	ICA	-	0.046	0%	0%	0%
Jan 26-31	ICA	-	0.044	0%	0%	0%
Feb 1-7	ICA	0.780	0.061	5%	37%	3%
Feb 8-14	ICA	0.661	0.075	1%	6%	1%
Feb 15-30	ICA	-	0.065	0%	0%	0%
Feb 22-28	ICA	-	0.054	0%	0%	0%
March 1-7	ICA	0.450	0.049	0%	2%	1%

### **1.3.1 Component 1: Timing options**

~~Option 1) Closure during portion or all of A season~~

~~Option 2) Closure during portion of all of B season~~

**Staff comments:** The timing associated with the closure options are indicated in conjunction with specific closures themselves thus this component as structured is unnecessary

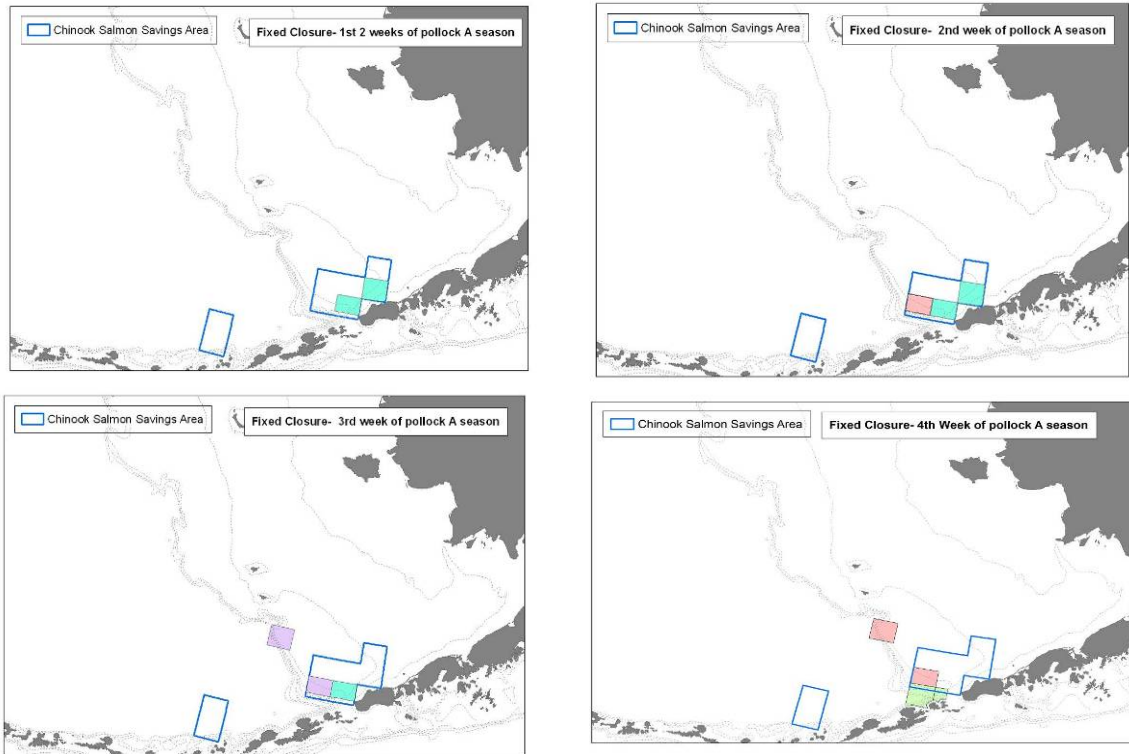
### **1.3.2 Component 2: Area options**

~~Option 1) Closures areas defined by historic effort~~

~~1a) Fixed A season closure (Chinook)–Note this is folded into the staff recommendation for fixed closure~~

~~1b) Sequential two-week A season closures (Chinook)~~

**Staff comments:** The following moving closure was proposed in a staff discussion paper in December 2007 and adopted by the Council in February 2008. As indicated in Figure 2, the closure areas are comprised of ADF&G statistical areas and vary by week based upon weekly analysis of the highest bycatch by stat areas over their 3 year timeframe considered (2004-2006). Further analysis and consideration of this option indicates that the catch rates are not as high (for salmon or as low for pollock) in these areas as previously considered in February. Closure of these areas is not likely to achieve desirable bycatch reduction. **For these reasons, staff recommends striking this closure option from further consideration at this time.**

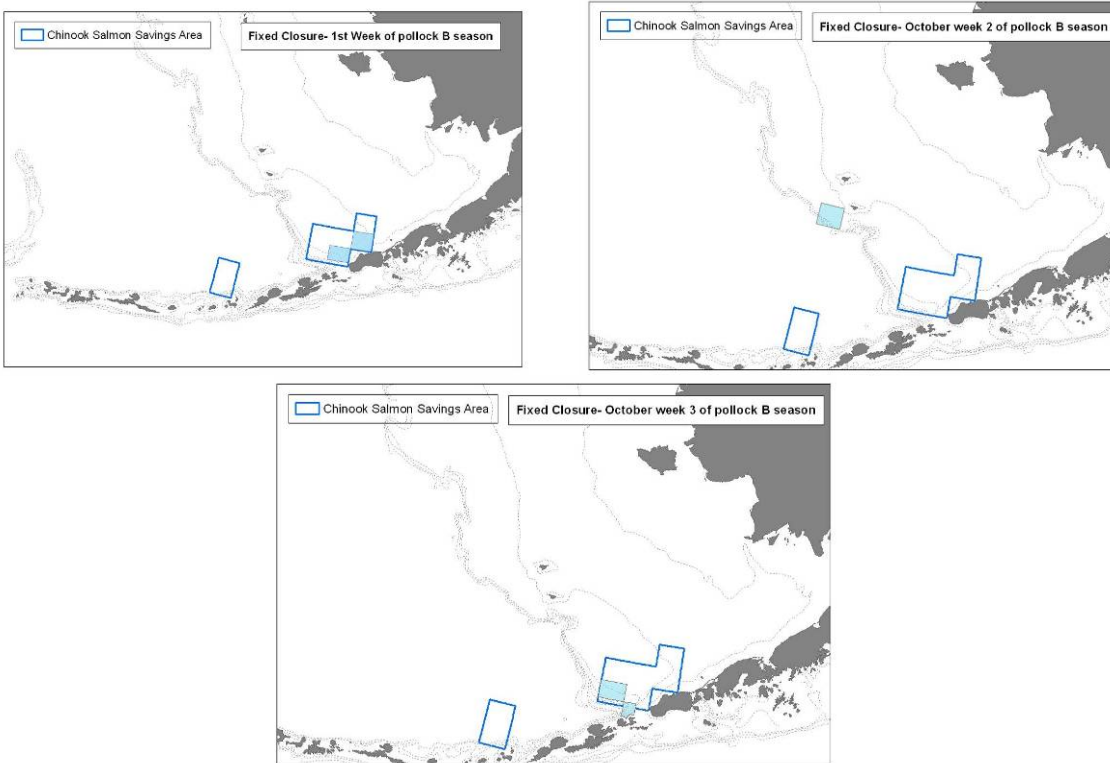


**Figure 2** Previously proposed area closure for reducing Chinook salmon bycatch for BS pelagic trawlers during the pollock A season [Note these closures are no longer recommended for inclusion in the alternatives at this time]. Panel a) Area closures for 1st two weeks of Pollock A season. Areas are composed by ADF&G statistical areas 645501 and 655430. Panel b) Area closures for 2nd week of pollock A season. Areas are composed by ADF&G statistical areas 645501, 655430 and 665430. Panel c) Area closures for 3rd week of pollock A season. Areas are composed by ADF&G statistical areas 655430, 665430, and 685530. Panel d) Area closures for 4th week of pollock A season. Areas are composed by ADF&G statistical areas 665430, 685530, 665401, and 655409.

**1e) Sequential two week B season closures (Chinook)**

This closure was indicated by staff in February to be undesirable as currently configured due to the lack of consideration of existing and competing closure over the time period under consideration in the B season for this closure. Staff have proposed B season closures that attempt to account for the closure consideration over the time period being evaluated. **This closure is not recommended by staff for inclusion in the analysis as it is likely mis-specified and thus unlikely to achieve desirable bycatch reduction.**





**Figure 3** Previously proposed fixed area closure for reducing Chinook salmon bycatch for BS pelagic trawlers during 1<sup>st</sup> week of October Pollock B season [Note these areas are no longer recommended for inclusion as area closures at this time]. Panel a) Areas closed during 1<sup>st</sup> week of pollock B season. Areas are composed by ADF&G statistical areas 645501 and 655430. Panel b) Area closed during 2<sup>nd</sup> week of pollock B season Area is composed by ADF&G statistical area 705600. Panel c) Areas closed during 3<sup>rd</sup> week of October Pollock B season. Areas are composed by ADF&G statistical areas 655409 and 665430.

**Option 2) Candidate Closure areas defined by rate-based criteria**

2a) Rate-based criteria 0.10 Chinook/pollock (t)

**Staff comments:** This closure configuration has been modified slightly and is included in staff recommendations below.

~~2b) Rate-based criteria 0.125 Chinook/pollock (t)~~

~~2c) Rate-based criteria 0.15 Chinook/pollock (t)~~

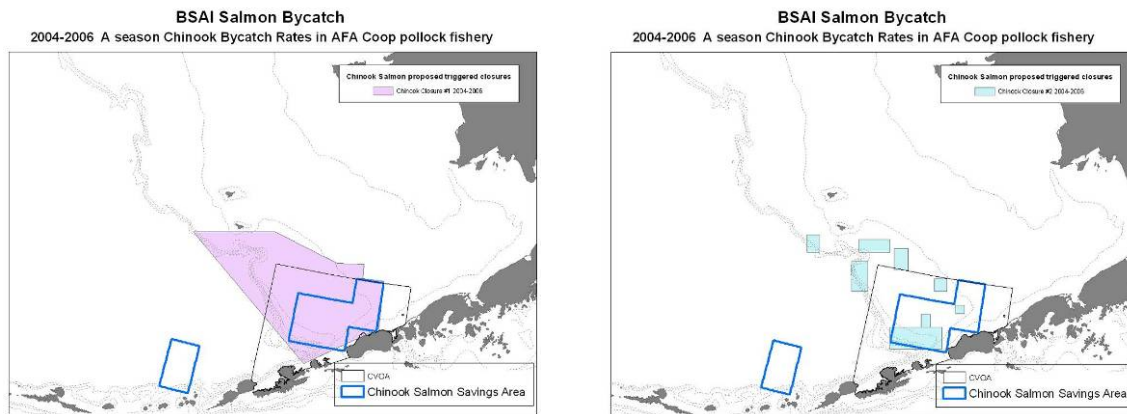
~~2d) Rate-based criteria 0.175 Chinook/pollock (t)~~

2e) Rate-based criteria 0.20 Chinook/pollock (t)

**Staff comments:** Note this rate has been utilized to define an area closure but results in a different configuration than that previously proposed.

These four rates as indicated above were analyzed in 10km square blocks with associated rate-break cutoffs and are shown in the trigger closure section. However, the higher rate-break closures as indicated for suboption 2e) in February as shown in Figure 4 resulted in a closure configuration of combined patchwork-like small, disassociated closures. Given the known difficulty in managing and enforcing a closure of this type, staff reevaluated both the large and small scale area closures using the rate-based criteria and proposed alternative configurations (under Alternative 4, Triggered closures). The revised closures are intended by staff to provide a more realistic closure scenario for management and enforcement utilizing similar criteria as was used to define the end-points of the previously adopted

closures. The mid-points as suggested by the Council for consideration (suboptions 2b-2d) were also considered in creating the closures as suggested in Alternative 4.



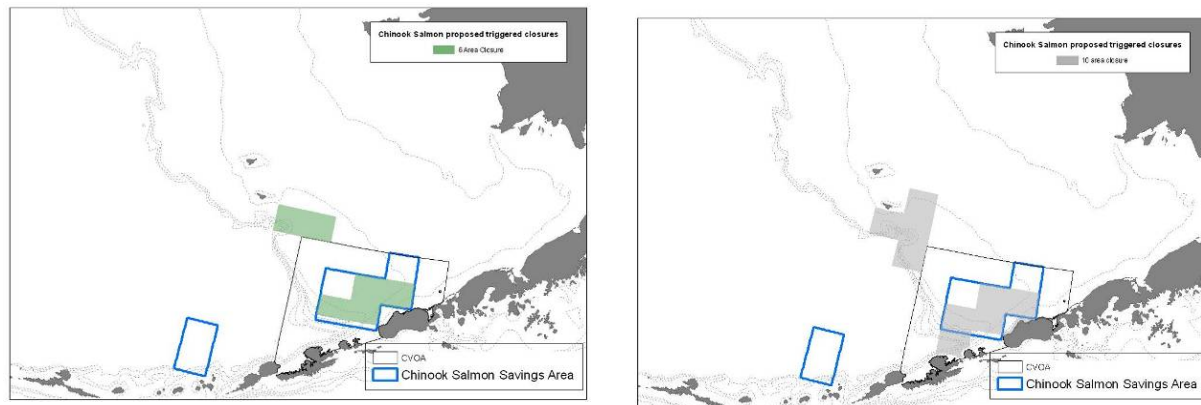
**Figure 4** Previously recommended closure configuration based upon rate based closure configurations [Note revised closures to replace these are included in Alternative 4 staff suggestions]: panel a) threshold criteria of 0.10 Chinook/t of pollock using 2004-2006 observer estimates in the pollock A season. Panel b) threshold bycatch rate 0.20 Chinook/t of pollock using 2004-2006 observer estimates in the pollock A season.

~~Option 3) Candidate Closure areas defined by percent bycatch reduction criteria~~

~~3a) 50% bycatch reduction closure~~

~~3b) 75% bycatch reduction closure~~

**Staff comments:** These closure configurations have some problems with the data utilized to formulate the closure itself and are not thought to achieve the desired bycatch reduction goal as currently configured (**Figure 5**). Equivalent bycatch reduction goals can be met instead by the triggered closure configurations proposed by staff in the recommendations to follow. Further these closure configurations as recommended by staff are also categorized to indicate the relative percentage bycatch reduction achieved over time with the closure and hence meets the equivalent goal of bycatch reduction as perceived in these options.



**Figure 5** Previously recommended closure configurations based on overall bycatch reduction goals [Note revised closures to replace these are included in Alternative 4 staff suggestions]: Panel a) example of 50%

bycatch reduction based on 2004-2006 observed bycatch numbers and pollock CPUE. Panel b) example of 75% bycatch reduction based on 2004-2006 observed bycatch numbers and pollock CPUE.

#### **1.3.2.1.1 Suboption: Periodic adjustments to areas based on updated bycatch information.**

The Council will reassess updated salmon bycatch information after a certain number of years and determine if adjustments to any closure areas implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

### **1.4 Alternative 4: Triggered closures (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. The duration of the closure may vary according to stair-stepped cap levels whereby additional areas close (or reopen) depending on seasonal thresholds for species specific bycatch levels. Closures may involve a single area or multiple areas. Additional details on candidate closure areas and times are presented below.

Absent a subdivided cap, the CDQ Program would receive allocations of 7.5 percent of any BS Chinook salmon trigger cap and 10.7 percent of any non-Chinook salmon trigger cap as PSQ reserves. These PSQ reserves would be further allocated among the six CDQ groups based on percentage allocations approved by NMFS on August 8, 2005. Areas would close to directed pollock fishing for a particular CDQ group when that group's trigger cap is reached.

#### **1.4.1 Component 1: Trigger Cap Formulation**

Cap formulation for trigger caps is equivalent to those under consideration for hard caps. See section 1.2.1 for additional information on how caps are to be formulated for this component.

#### **1.4.2 Component 2: Sector Allocation**

Sector allocations are equivalent to those under consideration for hard caps. See section 1.2.2 for additional information on how caps are to be allocated by sector for this component.

#### **1.4.3 Component 3: Sector Transfer**

[placeholder in case there are any necessary changes to sector transfer provisions under this component from hard cap component]

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

**Option 2)** NMFS will rollover unused salmon bycatch to other sectors and other cooperatives still fishing

#### **1.4.4 Component 4: Area options**

**Staff recommendations** follow on closure configurations to replace those listed below. Timing options are included in the description of each area as appropriate for the closure itself. Methods for spatial

investigations included analysis of historical bycatch rates summarized by 10km square blocks both for the recent time period consistent with cap formulation options as displayed (2004-2006) as well as compared against longer-term historical data (1992-2007) and individual years, particularly those years in which the exemption to regulatory closures was in place (2007 A season, 2006-2007 B seasons).

**Option 1: Timing options**

- i. ~~A season~~
- ii. ~~B season~~

**Option 2: Area options**

- i. ~~Adjust area according to the number of salmon caught~~
- ii. ~~Single area closure~~
- iii. ~~Multiple area closures~~

Candidate areas (need to fold into option 2 above)

- 1) ~~Closures areas defined by historic effort~~
  - 1a) ~~Fixed A season closure (Chinook)~~
  - 1b) ~~Sequential two week A season closures (Chinook)~~
  - 1c) ~~Sequential two week B season closures (Chinook)~~
- 2) ~~Candidate Closure areas defined by rate based criteria~~
  - 2a) ~~Rate based criteria 0.10 Chinook/pollock (t)~~
  - 2b) ~~Rate based criteria 0.125 Chinook/pollock (t)~~
  - 2c) ~~Rate based criteria 0.15 Chinook/pollock (t)~~
  - 2d) ~~Rate based criteria 0.175 Chinook/pollock (t)~~
  - 2e) ~~Rate based criteria 0.20 Chinook/pollock (t)~~
- 3) ~~Candidate Closure areas defined by percent bycatch reduction criteria~~
  - 3a) ~~50% bycatch reduction closure~~
  - 3b) ~~75% bycatch reduction closure~~

**Staff recommendations for triggered Chinook closures:**

Three A season and two B season closures are put forward as triggered closure options for Chinook salmon. Further details on the areas, amount of pollock per Chinook catch seasonally and by week as well as the proposed proportion of the trigger and timing of closure thereof are listed for each configuration. Closures are reorganized as A and B season options. Each closure option as presented may be considered as a single closure option as listed, as well as a part of a package of expanding area closure option as noted in the options listed.

The following table summarizes by season the rates and relative catch inside the proposed closure area by season (Table 19 A-season and B-season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook, and effort, observed inside proposed areas based on 2004-2006 NMFS observer data.). Additional information on the weekly catch and effort are contained in the summary tables for each closure section below.

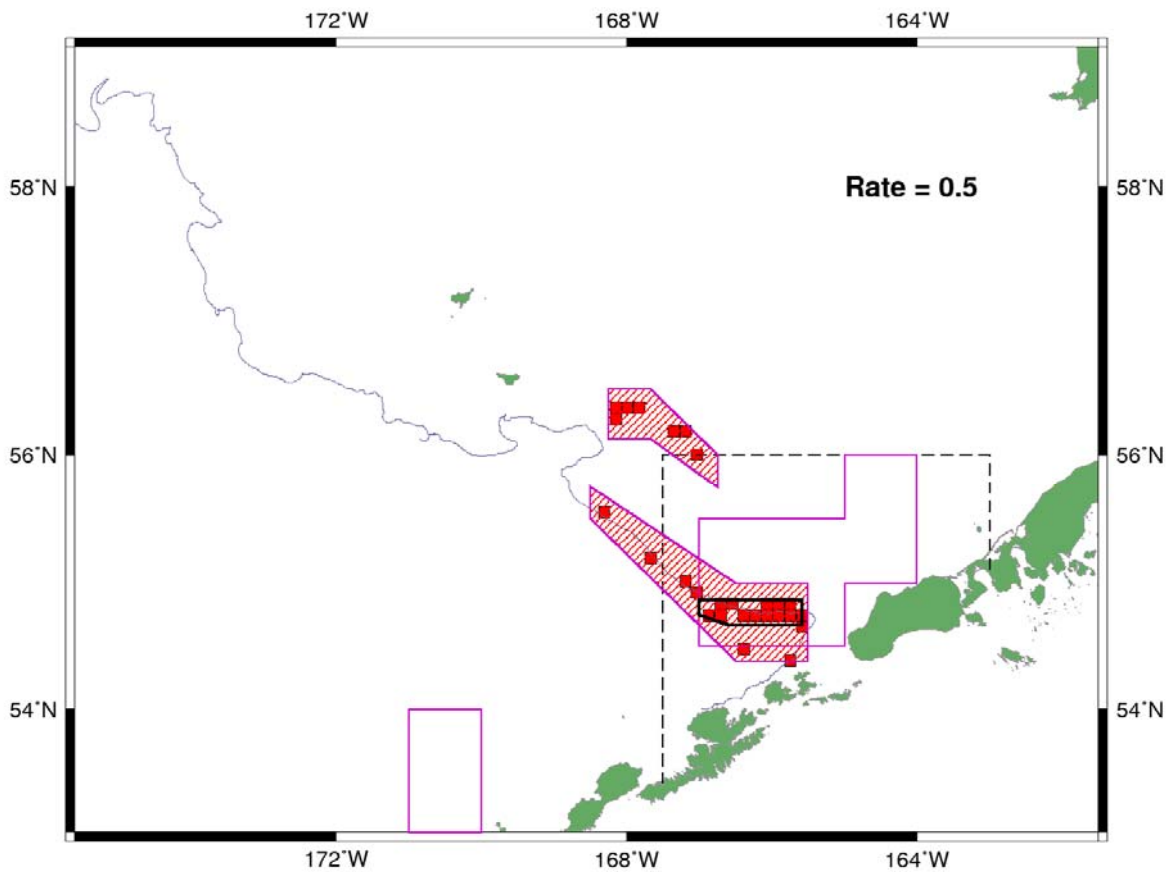
**Table 19 A-season and B-season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook, and effort, observed inside proposed areas based on 2004-2006 NMFS observer data.**

Season	Closure	Rate In	Rate Outside	Pollock inside	Chinook inside	Effort Inside
A	ICA	0.752	0.057	1%	8%	1%
A	Small	0.300	0.049	5%	24%	5%
A	Med	0.121	0.036	30%	59%	31%
A	Big	0.089	0.020	59%	86%	59%
B	Small	0.295	0.023	3%	28%	5%
B	Big	0.078	0.012	29%	73%	41%

**Option 1: A season closures**

**Option 1a) Small closure.**

This closure was identified by rate-based analysis delineating regions where average bycatch rates summarized by 10 km square blocks exceeded 0.5 Chinook per ton of pollock (Figure 6).



**Figure 6 Proposed A season area closure (option 1a)**

Over the entire A season the area defined from this closure contained 24% of the Chinook catch and only 5% of the total pollock catch from 2004-2006 (Table 19). By week the area has the highest amounts of Chinook catch throughout the month of February (Table 23 A-season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook, and effort, observed inside proposed areas based on 2004-2006 NMFS observer data broken out by week.). The coordinates of the closure are the following (Table 20):

**Table 20 Option 1a) Small area A-season coordinates**

55° 00'	166° 30'	56° 08'	168° 15'
55° 00'	165° 30'	56° 30'	168° 15'
54° 23'	165° 30'	56° 30'	167° 41'
54° 23'	165° 30'	56° 00'	166° 45'
54° 23'	166° 30'	55° 45'	166° 45'
55° 30'	168° 30'	56° 08'	167° 41'
55° 45'	168° 30'	56° 08'	168° 15'
55° 00'	166° 30'	56° 08'	168° 15'

As a single closure, the trigger for this closure is proposed as follows:

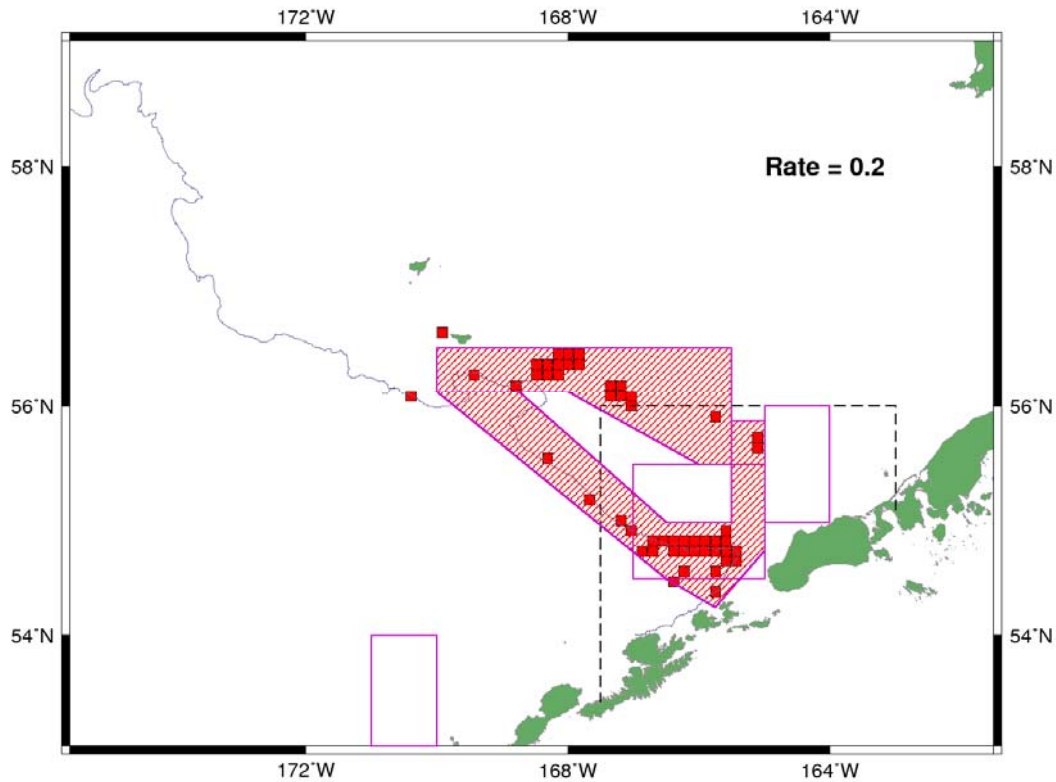
[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

If included as a multiple area closure (option for A season staircase) this would be the first step of the area closure. More information on that is contained in the description of option 1d.

#### **Option 1b) Medium closure**

This closure was identified by rate-based analysis delineating regions where average bycatch rates summarized by 10 km square blocks exceeded 0.2 Chinook per ton of pollock (Figure 7). Here the area comprised by the closure accounts for 59% of the Chinook and 30% of the pollock on average over the

entire A season for the 3 year time period 2004-



**Figure 7 Proposed A season medium area closure (option 1b)**

By week this closure encompasses consistently high Chinook (>20% by week, ranging as high as 79% in mid-February) with percentages of pollock catch ranging by week from 10-44% (Table 23). This particular area was constructed to include a range of areas comprised of finer-scale rate-based 10km square grids as requested by the Council in their February 2008 motion. This broader-scale area closure encompassing the finer-scale rate breakouts (as indicated in Figure 8) is recommended rather than consideration of individual, smaller-scale, disassociated small block closures by rate-based criteria which increase analytical burden and are more difficult to both manage and enforce.

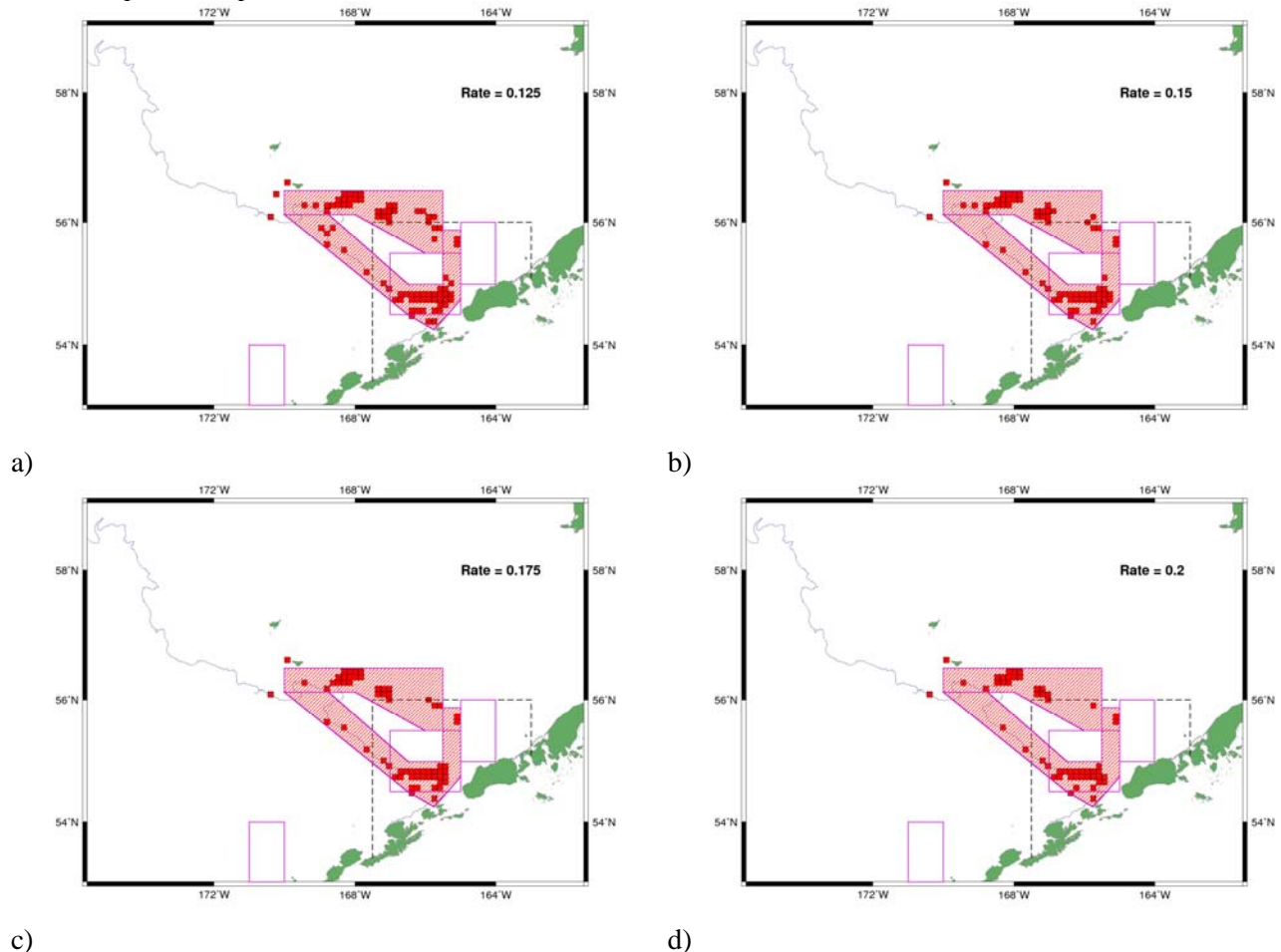
The coordinates of this closure are shown in Table 21.

**Table 21 Option 1b A-season area closure coordinates**

55° 00'	166° 30'	56° 08'	170° 00'
55° 00'	165° 30'	56° 08'	168° 45'
55° 53'	165° 30'	56° 08'	168° 00'
55° 53'	165° 00'	55° 30'	166° 00'
54° 45'	165° 00'	55° 30'	165° 30'
54° 15'	165° 45'	56° 30'	165° 30'
54° 30'	166° 30'	56° 30'	170° 00'
56° 08'	170° 00'	56° 08'	170° 00'
56° 08'	168° 45'		
55° 00'	166° 30'		

As a single closure option, the trigger for this region would be formulated as follows:  
 [Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

If included as a multiple area closure (option 1d for A season stair-step expanding area closure) this would be the second step of the expanding area closure. More information on that is contained in the description of option 1d.



**Figure 8 Range of rate-based area for consideration as candidate closures per February 2008 Council motion panel a) 0.125 Chinook/t of pollock; panel b) 0.15 Chinook/t of pollock; panel c) 0.175 Chinook/t of pollock; panel d) 0.2 Chinook/t of pollock. For reference the proposed option 1b area closure is shown in dappled shading.**

In February 2008, the Council reviewed candidate closures using a rate-based methodology that included rate-based cutoffs of 0.1 Chinook/ton pollock and 0.2 Chinook/ton pollock. At that time the Council requested that staff evaluate a range of options between these two end points with the intent to evaluate if these would provide for additional closure configurations. Figure 8 shows the relative 10km square blocks with rate cutoffs based on the following ranges, 0.125, 0.15, 0.175 and 0.2. For comparison against the closure designed on the rate-based cutoff of 0.2, the shaded area is included in all of the snapshots. As this figure demonstrates, the distinction between closure configurations based on the mid-range of orates between 0.1 to .2 Chinook/t pollock does not appear substantial enough to merit additional closures for these break-outs at this time. **Staff does not recommend continuing to include**



these rate-based closure considerations (0.125, 0.15, 0.175 Chinook/t pollock) in the suite of alternatives at this time

### Option 1c) Large area

This closure was identified by rate-based analysis delineating regions where average bycatch rates summarized by 10 km square blocks exceeded 0.1 Chinook per ton of pollock (Figure 9). Here the area comprised by the closure accounts for 85% of the Chinook and 59% of the pollock on average over the entire A season for the 3 year time period 2004-2006 (Table 23).

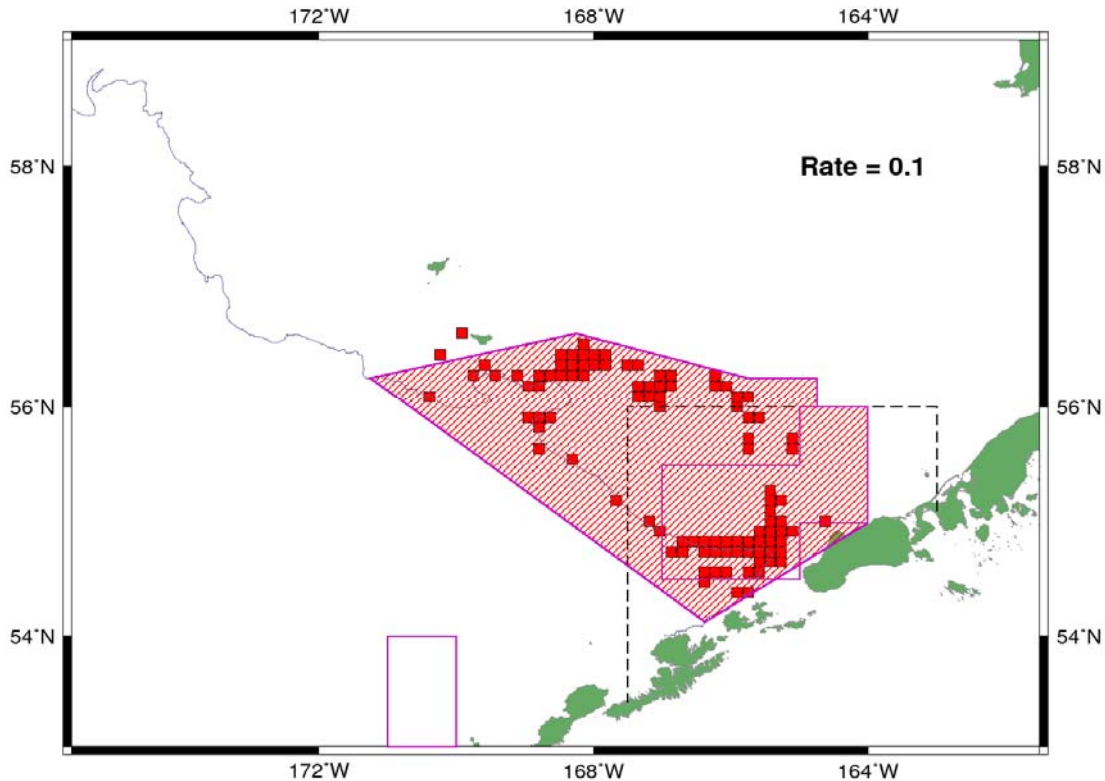


Figure 9 Option 1c large A season proposed are closure in conjunction with 10km sq blocks indicating bycatch rates in excess of 0.1 rates based on 2004-2006 NMFS observer data.

The coordinates of this closure are the following (Table 22):

Table 22 Option 1c)A-season large area coordinates

56° 15'	171° 15'	56° 00'	164° 45'
56° 38'	168° 15'	56° 00'	164° 00'
56° 15'	165° 45'	55° 00'	164° 00'
56° 15'	164° 45'	54° 08'	166° 23'
		56° 15'	171° 15'

By week this closure encompasses consistently high Chinook (>73% by week, ranging as high as 97%) with very high percentages of pollock catch ranging by week from 46-83% (Table 23)).

As a single closure option, the trigger for this region would be formulated as follows:

[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

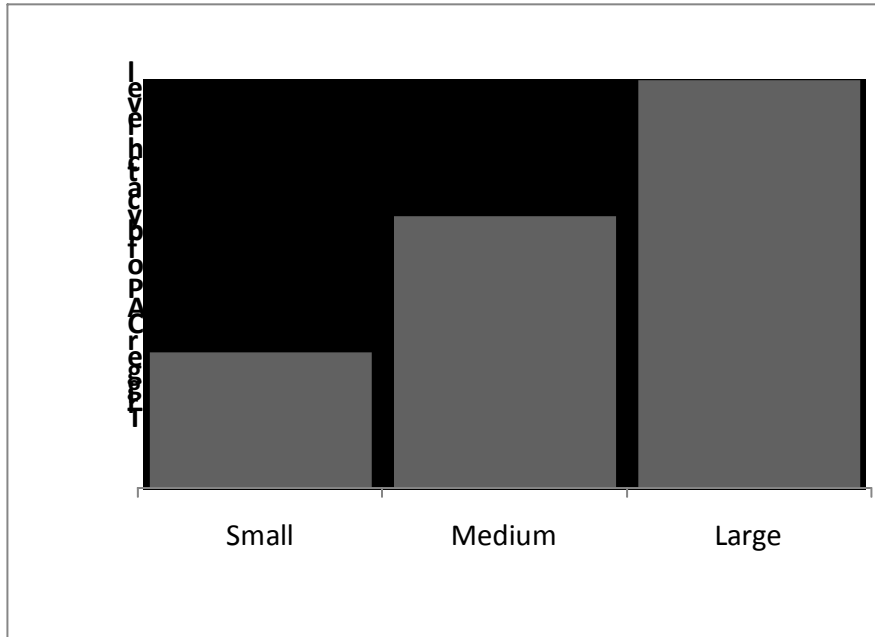
If included as a multiple area closure (option 1d for A season stair-step expanding area closure) this would be the final step of the expanding area closure option. More information on that is contained in the description of option 1d.

**Table 23 A-season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook, and effort, observed inside proposed areas based on 2004-2006 NMFS observer data broken out by week.**

Period	Closure	Rate In	Rate Outside	Pollock inside	Chinook inside	Effort
<b>All A-season</b>	<b>ICA</b>	<b>0.752</b>	<b>0.057</b>	<b>1%</b>	<b>8%</b>	<b>1%</b>
Jan 20-25	ICA	-	0.046	0%	0%	0%
Jan 26-31	ICA	-	0.044	0%	0%	0%
Feb 1-7	ICA	0.780	0.061	5%	37%	3%
Feb 8-14	ICA	0.661	0.075	1%	6%	1%
*Feb 15-30	ICA	-	0.065	0%	0%	0%
*Feb 22-28	ICA	-	0.054	0%	0%	0%
*March 1-7	ICA	0.450	0.049	0%	2%	1%
<b>All A-season</b>	<b>Small</b>	<b>0.300</b>	<b>0.049</b>	<b>5%</b>	<b>24%</b>	<b>5%</b>
Jan 20-25	Small	0.129	0.045	1%	1%	0%
Jan 26-31	Small	0.156	0.044	0%	1%	0%
Feb 1-7	Small	0.560	0.060	7%	41%	4%
Feb 8-14	Small	0.166	0.063	15%	32%	16%
*Feb 15-30	Small	0.247	0.046	10%	36%	10%
*Feb 22-28	Small	0.381	0.044	3%	20%	4%
*March 1-7	Small	0.231	0.048	1%	5%	2%
<b>All A-season</b>	<b>Medium</b>	<b>0.121</b>	<b>0.036</b>	<b>30%</b>	<b>59%</b>	<b>31%</b>
Jan 20-25	Medium	0.109	0.039	10%	24%	10%
Jan 26-31	Medium	0.067	0.040	14%	21%	11%
Feb 1-7	Medium	0.245	0.047	24%	62%	23%
Feb 8-14	Medium	0.131	0.037	44%	74%	46%
*Feb 15-30	Medium	0.134	0.022	39%	79%	41%
*Feb 22-28	Medium	0.092	0.025	44%	74%	46%
*March 1-7	Medium	0.076	0.036	36%	55%	39%
<b>All A-season</b>	<b>Big</b>	<b>0.089</b>	<b>0.020</b>	<b>59%</b>	<b>86%</b>	<b>59%</b>
Jan 20-25	Big	0.053	0.009	83%	97%	75%
Jan 26-31	Big	0.058	0.016	67%	88%	66%
Feb 1-7	Big	0.126	0.017	71%	95%	69%
Feb 8-14	Big	0.104	0.017	71%	94%	71%
*Feb 15-30	Big	0.115	0.014	51%	90%	51%
*Feb 22-28	Big	0.084	0.020	54%	83%	57%
*March 1-7	Big	0.079	0.026	46%	73%	51%

\*Note that in 2006 directed fishing for pollock in the non-CDQ trawl fishery in the Chinook Salmon Savings Area closed on February 15<sup>th</sup> until April 15<sup>th</sup>.

**Option 1d) Expanding area closure.** This closure option takes all three areas collectively as an expanding area closure. A stair-step trigger cap limit closes each area as threshold trigger levels are reached (Figure 10). This stair-step begins with the closure of area 1a at trigger level 1, then if bycatch continues and trigger level 2 is reached, area 1b closes. If bycatch continues high enough to reach trigger level 3, then area 1c closes. Here closures once triggered are considered to remain closed for the remainder of the season. Additional information will be provided in the Council briefing materials with respect to how these specific proportional trigger levels would be formulated.



**Figure 10: Diagram of example cap thresholds (Y axis) and resulting area closures (x axis) under the option 1d expanding area closure option.**

**Option 2: B season area closure options:**

Two different closure configurations are proposed as B season closure options. These closures could be considered as separate triggered closures options as described in the suboptions below or considered as a combined stairstep closure beginning with the smaller closure and moving to the larger area closure dependant upon reaching the appropriate trigger threshold.

**Option 2a) Small closure:**

This closure was identified by rate-based analysis delineating regions where average bycatch rates in the 10 km square blocks exceeded 0.5 Chinook salmon per ton of pollock (Figure 11). Over the entire B season the area defined from this closure contained 28% of the Chinook catch and only 3% of the total pollock catch from 2004-2006 (Table 19). Weekly rates on average over the time period considered show relatively high Chinook catch by week compared to pollock catch in this area throughout September to October (Table 26).

The coordinates of the closure are shown in Table 24:

**Table 24 Option 2a) Small area B-season coordinates**

56° 08'	171° 30'	54° 45'	167° 00'
56° 24'	171° 30'	56° 00'	170° 00'
56° 15'	170° 15'	56° 00'	170° 00'
55° 00'	166° 45'	56° 08'	171° 30'

As a single closure, the trigger for this closure is proposed as follows:

[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

If included as a multiple area closure (option 2c for B season stair-step area closure) this would be the first step of the area closure. More information on that is contained in the description of option 2c. .

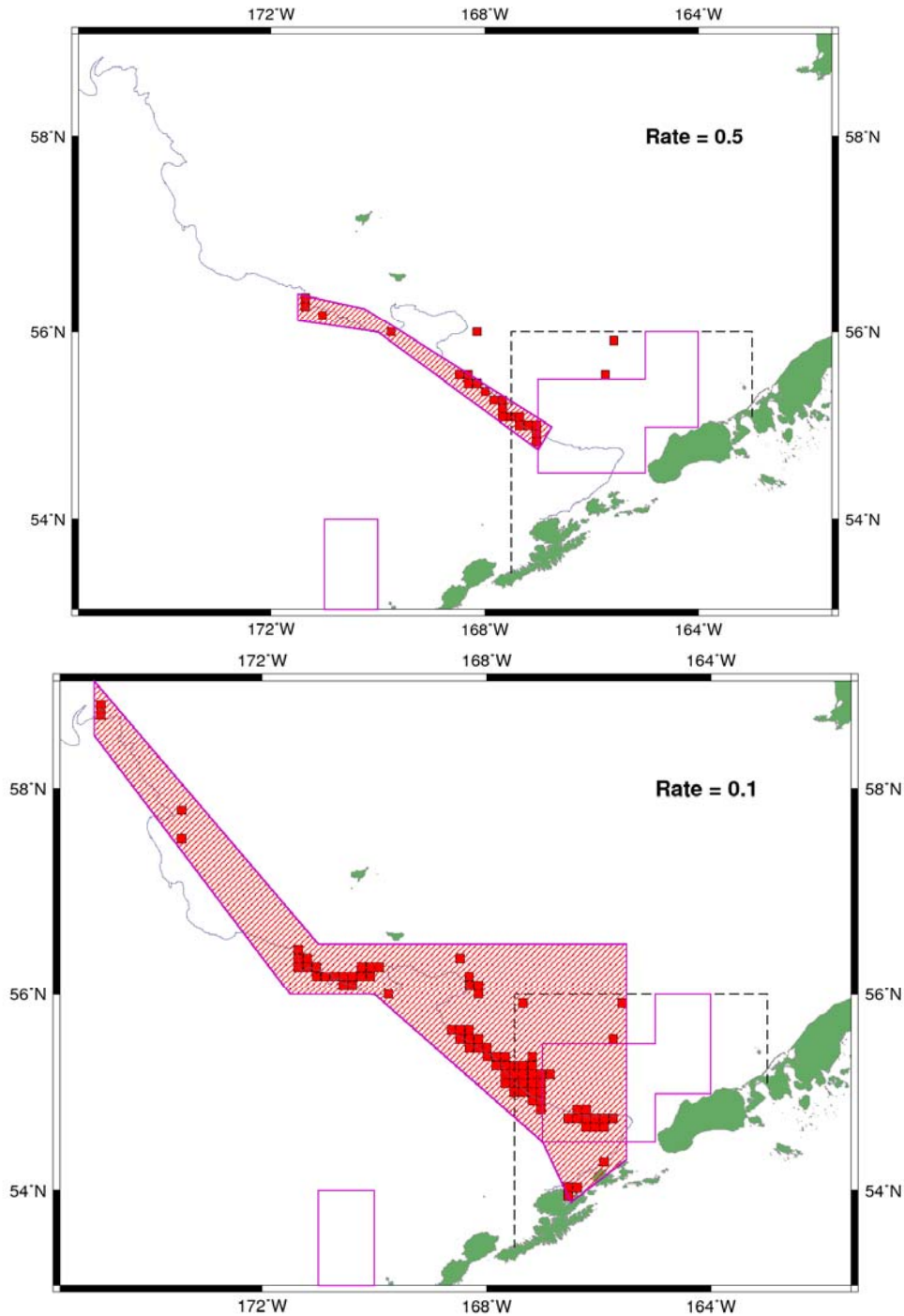
### **Option 2b) Large closure**

This closure was identified by rate-based analysis delineating regions where average bycatch rate exceeded 0.1 Chinook salmon per ton of pollock (Figure 11). Over the entire B season the area defined from this closure contained 73% of the Chinook catch and only 29% of the total pollock catch from 2004-2006 (Table 19). Weekly rates on average over the time period considered show relatively high Chinook catch by week compared to pollock catch in this area throughout September to October (Table 26).

The coordinates of the closure are the following:

**Table 25 Option 2b Big area B-season coordinates**

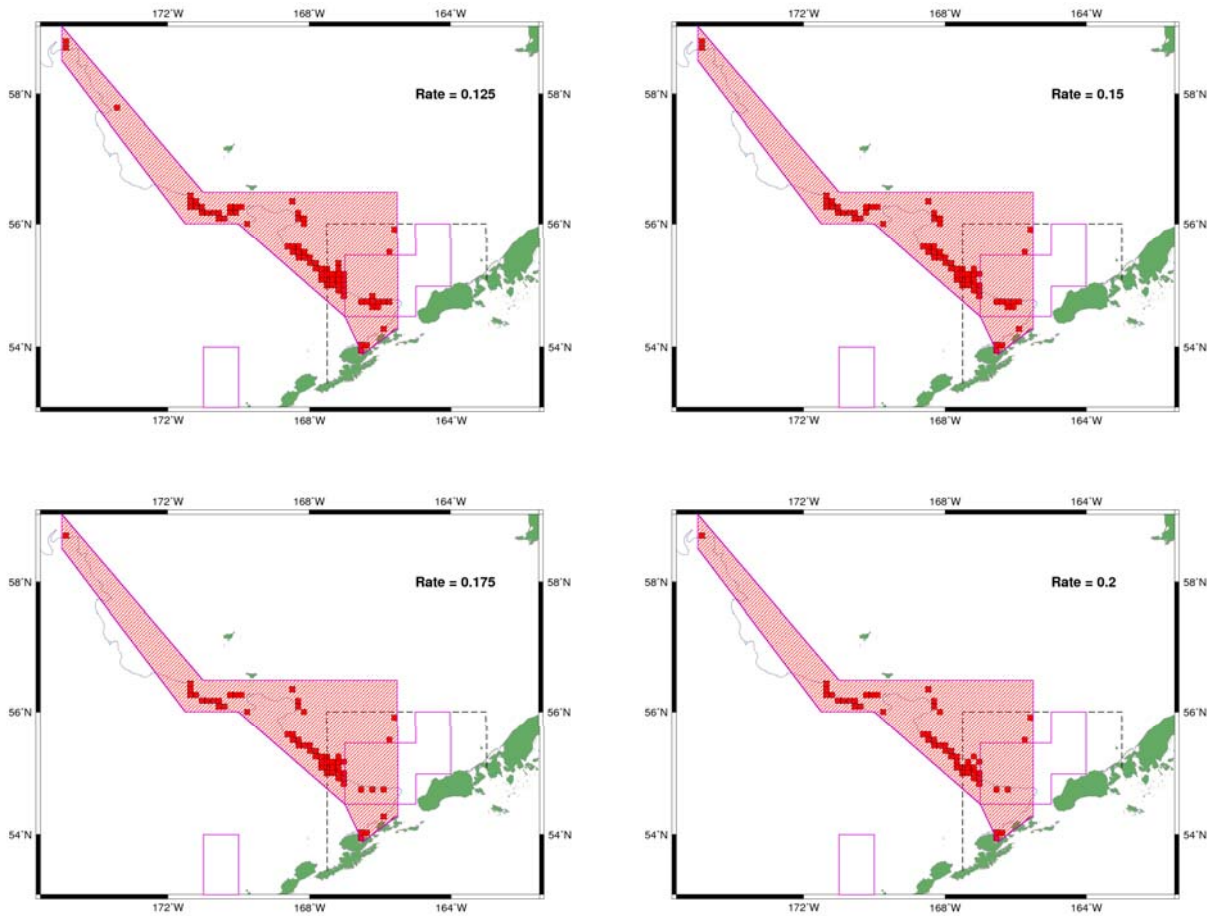
58° 30'	175° 00'	54° 20'	165° 30'
59° 00'	175° 00'	53° 53'	166° 30'
56° 30'	171° 00'	54° 30'	167° 00'
56° 30'	165° 30'	56° 00'	170° 00'
55° 53'	165° 30'	56° 00'	170° 00'
54° 45'	165° 30'	56° 00'	171° 30'
		58° 30'	175° 00'



**Figure 11** Comparisons of the proposed B-season Chinook closed areas (big, and small) and 10km cells where the Chinook bycatch catch per t of pollock exceeded the average indicated by “Rate = ...” legends. Values based on 2004-2006 NMFS observer data.

As a single closure, the trigger for this closure is proposed as follows: [Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

If included as a multiple area closure (option 2c for B season stair-step expanding area closure) this would be the second (and final) step of the area closure. More information on that option is contained under option 2c.



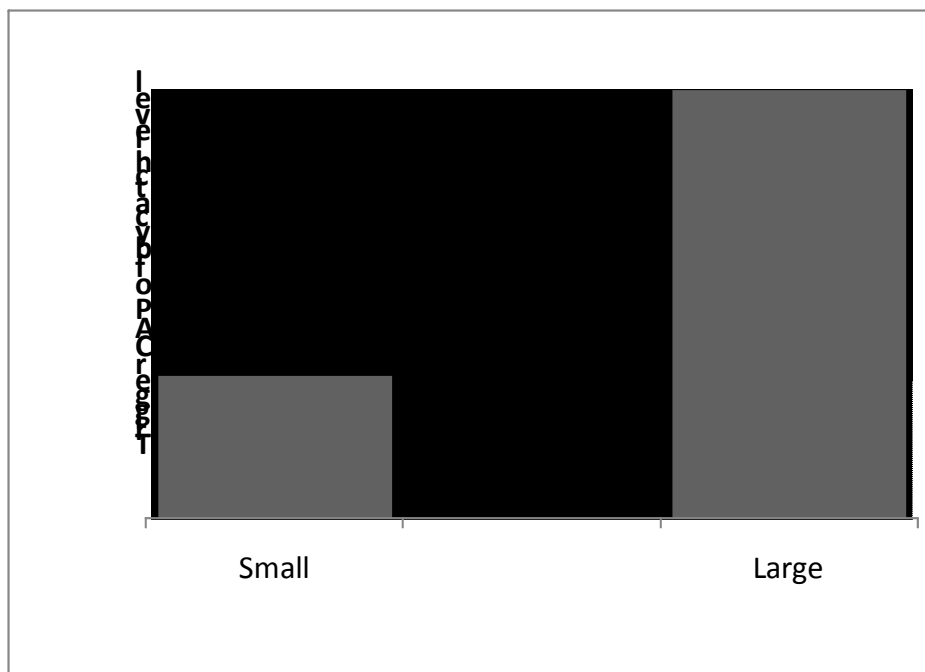
**Figure 12 Range of rate-based area for consideration as candidate closures per February 2008 Council motion panel a) 0.125 Chinook/t of pollock; panel b) 0.15 Chinook/t of pollock; panel c) 0.175 Chinook/t of pollock; panel d) 0.2 Chinook/t of pollock. For reference the proposed option 2b area closure is shown in dapped shading.**

Similar to the discussion under the range of rate-based considerations for A season closures, in February 2008, the Council reviewed candidate closures using a rate-based methodology that included rate-based cutoffs of 0.1 Chinook/ton pollock and 0.2 Chinook/ton pollock. At that time the Council requested that staff evaluate a range of options between these two end points with the intent to evaluate if these would provide for additional closure configurations. Figure 12 shows the relative 10km square blocks with rate cutoffs based on the following ranges, 0.125, 0.15, 0.175 and 0.2. For comparison, the option 2b closure designed on the rate-based cutoff of 0.1 (i.e., the shaded area) is included in all of the snapshots. As this figure demonstrates, the distinction between closure configurations based on the mid-range of rates between 0.1 to 0.2 Chinook/t pollock does not appear substantial enough to merit additional closures for these break-outs at this time. **Staff does not recommend continuing to include these rate-based closure considerations (0.125, 0.15, 0.175 Chinook/t pollock) in the suite of alternatives at this time.**

**Table 26 B-season rates (Chinook/t of pollock) in and outside of proposed closures relative to the proportion of pollock, Chinook, and effort, observed inside proposed areas based on 2004-2006 NMFS observer data broken out by week. Note that in September during the years 2004-2006 the Chinook Salmon Savings Area closed to directed non-CDQ pollock fishing. During 2006 the fleet operated under an exemption to regulatory closures.**

Period	Closure	Rate Inside	Rate Outside	Pollock inside	Chinook inside	Effort inside
<b>B-season</b>	<b>Small</b>	<b>0.295</b>	<b>0.023</b>	<b>3%</b>	<b>28%</b>	<b>5%</b>
Sept 1-7	Small	0.069	0.022	4%	12%	5%
Sept 8-14	Small	0.239	0.041	4%	19%	7%
Sept 15-21	Small	0.239	0.036	3%	16%	6%
Sept 22-30	Small	0.276	0.038	3%	17%	6%
Oct 1-7	Small	0.437	0.085	5%	20%	9%
Oct 8-14	Small	0.927	0.123	11%	48%	16%
Oct 15-21	Small	0.515	0.148	10%	28%	14%
<b>B-season</b>	<b>Big</b>	<b>0.078</b>	<b>0.012</b>	<b>29%</b>	<b>73%</b>	<b>41%</b>
Sept 1-7	Big	0.059	0.017	17%	43%	31%
Sept 8-14	Big	0.097	0.029	29%	57%	45%
Sept 15-21	Big	0.103	0.025	21%	52%	38%
Sept 22-30	Big	0.156	0.021	17%	60%	33%
Oct 1-7	Big	0.348	0.042	19%	66%	36%
Oct 8-14	Big	0.498	0.027	39%	92%	58%
Oct 15-21	Big	0.309	0.025	56%	94%	72%

**Option 2c: Expanding area closure.** This closure option takes both B season areas together as an expanding area closure. A stair-step trigger cap limit closes each area as threshold trigger levels are reached (figure x). This stair-step begins with the closure of area 2a at trigger level 1. If bycatch continues and trigger level 2 is reached, area 2b closes. Here closures once triggered are considered to remain closed for the remainder of the season. Additional information will be provided in the Council briefing materials with respect to how these specific proportional trigger levels would be formulated.



**Figure 13** Diagram of example cap thresholds (Y axis) and resulting area closures (x axis) under the option 2c expanding area closure option.

#### 1.4.4.1.1 Suboption: Periodic adjustments to areas based on updated bycatch information.

The Council will reassess updated salmon bycatch information after a certain number of years and determine if adjustments to the area closures implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

## 2.0 ACTION 2: NON-CHINOOK SALMON (CHUM)

This action is for non-Chinook salmon species. For catch accounting and PSC limits all 4 species are aggregated into an 'other salmon' or non-Chinook salmon species category. Chum salmon continues to comprise over 99.6% of the total catch in this category (Table 27).

**Table 27** Composition of bycatch by species in the non-Chinook salmon category 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



For this reason this action while generalized for all non-Chinook species, is focused upon chum salmon. Chapter 6 will likewise focus upon on the biology and impacts for chum salmon species only understanding that the remaining species, comprise collectively less than 0.04% of the total catch in any year in this category.

## 2.1 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.

For chum salmon, the Chum Salmon Savings Area was established in 1994 by emergency rule, and then formalized in the BSAI Groundfish FMP in 1995 under Amendment 35 (ADF&G 1995b). This area is closed to pollock trawling from August 1 through August 31. Additionally, if 42,000<sup>2</sup> 'other' salmon are caught in the Catcher Vessel Operational Area (CVOA) during the period August 15-October 14, the area remains closed to pollock trawling for the remainder of the period September 1 through October 14 in the Chum Salmon Savings Area. As catcher processors are prohibited from fishing in the CVOA during the "B" season, unless they are participating in a CDQ fishery, only catcher vessels and CDQ fisheries are affected by the PSC limit.

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 this alternative, the CDQ Program would continue to receive allocations of 7.5 percent of the BS and AI Chinook salmon PSC limits and 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.

## 2.2 Alternative 2: Hard Cap (non-Chinook)

This alternative would establish a non-Chinook salmon bycatch cap on the pollock fishery upon attainment of which all directed pollock fishing would cease. Only those BSAI non-Chinook caught by the pollock fleet would accrue towards the cap and the cap applies only to the pollock fleet when triggered.

If applied as a single hard cap to all sectors, the CDQ Program would receive an allocation of 10.7% of any hard cap established for non-Chinook salmon. The PSQ reserve would be further allocated among the six CDQ groups based on percentage allocations approved by NMFS on August 8, 2005. Each CDQ group would be prohibited from exceeding its salmon PSQ allocation. This prohibition would require the CDQ group to stop directed fishing for pollock CDQ once its PSQ allocation is reached because further directed fishing for pollock likely would result in exceeding its PSQ allocation.

If the hard cap is subdivided, two options are provided (under component 2) for the allocation to the CDQ program.

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<sup>2</sup> This number is inclusive of the allocation to CDQ groups. Non-CDQ 'other salmon' limit is 38,850.

### 2.2.1 Component 1: Hard Cap Formulation

Component 1 establishes the hard cap number by two methodologies, option 1 based upon averages of historical numbers and other considerations as noted below and option 2 which uses a modeling methodology to establish a framework for periodically setting the cap based upon salmon returns. Component 1 sets the formulation for the overall cap which 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 1 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 28 Range of suboptions for hard cap for non-Chinook with breakout for CDQ allocation (10.7%) and remainder for non-CDQ fleet**

Sub Option	Non-Chinook	CDQ	Non-CDQ
i)	58,176	6,225	51,951
ii)	76,252	8,159	68,093
iii)	147,204	15,751	131,453
iv)	203,080	21,730	181,350
v)	220,614	23,606	197,008
vi)	347,984	37,234	310,750
vii)	488,045	52,221	435,824

The following section provides the rationale (by suboption number) for each cap number listed in Table 28. Suboption i-ii (58,176 and 76,252, the low end of the range of caps considered) represent the 5 year average from 1997-2001 (i) and the 10 year average 1992-2001 (suboption ii). These year combinations were 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).

Suboptions iii-vii refer to average bycatch numbers by the pollock pelagic trawl fishery over a range of historical year combinations from 1997 through 2006, dropping some years over the period under consideration in some options. Suboption iii) is the 10 year average (1997-2006) with the highest year (2005) dropped from the years over which average occurred while suboption iv) is the 10 year average (1997-2006) with the lowest year (1999) dropped from the years over which average occurred. Suboption v) is the straight 10 year average (including all years 1997-2006), vi) is the 5 year average (2002-2006) and vii) is the three year average for the most years under consideration (2004-2006).

For analytical purposes the following range of numbers will be utilized:

**Table 29 Range of non-Chinook salmon caps for use in the analysis of impacts.**

	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

**Option 2: Framework Cap (cap set relative to salmon returns):**

Caps under this option will be based on analysis by species and involve consideration of run-size impacts. Since this approach involves a number of uncertain components (e.g., river-of-origin, ocean survival, future expected run-size) the cap will be derived from estimated probabilities that account for this uncertainty. This option provides a framework so that the cap regulation could be modified as scientific information improves. Such changes in the cap are envisioned on a periodic basis (say every 2-5 years) as data and input variables critical to the model calculations improve and merit revisions to cap levels. Variables and data that are likely to change with improved scientific information include river of origin information on the stock composition of bycatch samples, stock size estimates by river system, and age-specific survival of salmon returning to individual river systems.

The developed methods are designed to account uncertainty due to both natural variability and observation (measurement) errors. The choice of management alternative can be based on the selection of an acceptable impact level (at specified probability) for a set of rivers or systems. This impact level can then be used to back-calculate the cap level. For example, a framework for this alternative might be to establish a cap that has only a 10% probability of exceeding a 10% impact level to a particular run. The impact measure relates the historical bycatch levels relative to the subsequent returning salmon run  $k$  in year  $t$ :

$$u_{t,k} = \frac{C_{t,k}}{C_{t,k} + S_{t,k}}$$

where  $C_{t,k}$  and  $S_{t,k}$  are the bycatch and stock size estimates of chum salmon. The calculation of  $C_{t,k}$  includes the bycatch of salmon returning to spawn in year  $t$  and the bycatch from previous years of the same cohort (i.e., at younger, immature ages). This latter component needs to be decremented by highly uncertain ocean survival rates. Additionally, uncertainty on age-assignments and river-of-origin, as well as uncertainty of run-size impact these values. A complete description of the model, estimation procedure, and input values are detailed in Appendix X.

A policy decision is required in specifying an acceptable (probability based) run-size impact level by river system in order to calculate a corresponding salmon bycatch cap level. For regulatory purposes, the adopted procedure must be based on objective criteria and may not be discretionary in nature. Clearly, the probability of an acceptable run size impact level is discretionary and therefore must be an approved fixed value that can vary only with completely revised analyses. The value is thus a policy decision before the Council. Other non-discretionary aspects of the approach may be modified as information improves following standard scientific guidelines and review by the SSC. For the present analysis, a range of impact levels and corresponding cap levels are provided to the Council for consideration and comparison with the fixed value cap levels specified under option 1.

### 2.2.1.1.1 Suboption: Periodic adjustments to cap based on updated bycatch information.

The Council will reassess updated salmon bycatch information after a certain number of years and determine if adjustments to the hard cap implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

## 2.2.2 Component 2: Sector Allocation

Under this component the hard cap is managed at the sector level for the fishery. This entails 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 specified for that sector, a fishery closure would occur for 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, options 1 and 2. However using each of those options (and suboptions) for cap formulation, the cap is then subdivided into sector level caps according to the following formulas:

Divide the final cap by sectors based on:

**Option 1)** 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 is intended to follow 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, option 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%).

**Table 30 Sector split caps resulting from option 1 percentage allocation: 10% CDQ and the remaining 90% divided 50% inshore CV fleet; 10% for mothership fleet; 40% for the offshore CP fleet**

### Option 1) Sector level caps

Sub Option	Fishery cap #s Non- Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	58,176	5,818	26,179	5,236	20,943
ii)	76,252	7,625	34,313	6,863	27,451
iii)	147,204	14,720	66,242	13,248	52,993
iv)	203,080	20,308	91,386	18,277	73,109
v)	220,614	22,061	99,276	19,855	79,421
vi)	347,984	34,798	156,593	31,319	125,274
vii)	488,045	48,805	219,620	43,924	175,696

For analytical purposes the following ranges will be utilized (Table 31):

**Table 31 Range of sector level non-Chinook caps for use in the analysis of alternatives**

	Non- Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	58,000	5,800	26,100	5,220	20,880
ii)	201,300	20,130	90,585	18,117	72,468
iii)	345,000	34,500	155,250	31,050	124,200
iv)	488,000	48,800	219,600	43,920	175,680

**Option 2)** Historical average of percent bycatch by sector based on:

- a) 3 year (2004-2006) average CDQ 1%; inshore CV fleet 86%; mothership fleet 2%; offshore CP fleet 11%
- b) 5 year (2002-2006) average: CDQ 2%; inshore CV fleet 84%; mothership fleet 3%; offshore CP fleet 11%.
- c) 10 year (1997-2006) average: CDQ 2%; inshore CV fleet 82%; mothership fleet 4%; offshore CP fleet 12%.

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. Similar to the years considered for the overall cap formulation, the historical years do not consider the most recent (and historical high) of 2007.

**Option 2a** uses the historical averages of percent bycatch by sector from the most recent time period under consideration in this analysis (2004-2006). This results in the following average percentages by sector: CDQ 1%; shore-based CV fleet 86%; mothership fleet 2%; offshore CP fleet 11%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 32).

**Table 32 Sector level caps based upon historical average percent bycatch from 2004-2006 (option 2a)**

**Option 2a) Sector level caps (2004-2006 average)**

Sub Option	Fishery cap #s Non-Chinook	CDQ 1%	Inshore CV 86%	Mothership 2%	Offshore CPs 11%
i)	58,176	582	50,031	1,164	6,399
ii)	76,252	763	65,577	1,525	8,388
iii)	147,204	1,472	126,595	2,944	16,192
iv)	203,080	2,031	174,649	4,062	22,339
v)	220,614	2,206	189,728	4,412	24,268
vi)	347,984	3,480	299,266	6,960	38,278
vii)	488,045	4,880	419,719	9,761	53,685

For analytical purposes the following range of sector split caps will be utilized for this option:

**Table 33 Range of sector level caps (option 2a) for use in the analysis of impacts**

	Non-Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	58,000	580	49,880	1,160	6,380
ii)	201,300	2,013	173,118	4,026	22,143
iii)	345,000	3,450	296,700	6,900	37,950
iv)	488,000	4,880	419,680	9,760	53,680

**Option 2b** considers the historical averages of percent bycatch by sector from the 5 year time period (2002-2006). This results in the following average percentages by sector: CDQ 2%; inshore CV fleet 84%; mothership fleet 3%; offshore CP fleet 11%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 34).

**Table 34 Sector level caps based upon historical average percent bycatch from 2002-2006 (option 2b)**

**Option 2b) Sector level caps (2002-2006 average)**

Sub Option	Fishery cap #s Non-Chinook	CDQ 2%	Inshore CV 84%	Mothership 3%	Offshore CPs 11%
i)	58,176	1,164	48,868	1,745	6,399
ii)	76,252	1,525	64,052	2,288	8,388
iii)	147,204	2,944	123,651	4,416	16,192
iv)	203,080	4,062	170,587	6,092	22,339
v)	220,614	4,412	185,316	6,618	24,268
vi)	347,984	6,960	292,307	10,440	38,278
vii)	488,045	9,761	409,958	14,641	53,685

For analytical purposes the following range of sector split caps for this option will be utilized (Table 35):

**Table 35 Range of sector level non-Chinook salmon caps (option 2b) for use in the analysis of impacts**

	Non-Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	58,000	1,160	48,720	1,740	6,380
ii)	201,300	4,026	169,092	6,039	22,143
iii)	345,000	6,900	289,800	10,350	37,950
iv)	488,000	9,760	409,920	14,640	53,680

**Option 2c** considers the historical averages of percent bycatch by sector from the 10 year time period (1997-2006). This results in the following average percentages by sector: CDQ 2%; inshore CV fleet 82%; mothership fleet 4%; offshore CP fleet 12%. Those percentages are applied to the range of caps under consideration in component 1, option 1 (Table 36).

**Table 36 Sector level caps based upon historical percent bycatch from 1997-2006 (option 2c)**

**Option 2c) Sector level caps (1997-2006 average)**

Sub Option	Fishery cap #s Non-Chinook	CDQ 2%	Inshore CV 82%	Mothership 4%	Offshore CPs 12%
i)	58,176	1,164	47,704	2,327	6,981
ii)	76,252	1,525	62,527	3,050	9,150
iii)	147,204	2,944	120,707	5,888	17,664
iv)	203,080	4,062	166,526	8,123	24,370
v)	220,614	4,412	180,903	8,825	26,474
vi)	347,984	6,960	285,347	13,919	41,758
vii)	488,045	9,761	400,197	19,522	58,565

For analytical purposes the following range of sector split caps for this option will be utilized:

**Table 37 Range of sector level non-Chinook caps for use in the analysis of impacts (option 2c)**

	Non-Chinook	CDQ	Inshore CV	Mothership	Offshore CPs
i)	58,000	1,160	47,560	2,320	6,960
ii)	201,300	4,026	165,066	8,052	24,156
iii)	345,000	6,900	282,900	13,800	41,400
iv)	488,000	9,760	400,160	19,520	58,560

### 2.2.3 Component 3: Sector Transfer

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

**Option 2)** NMFS will rollover unused salmon bycatch to other sectors and other cooperatives still fishing [placeholder for NMFS description of option]

### 2.2.4 Component 4: Cooperative provisions

These provisions apply for the in-shore catcher vessel cooperatives. Each cooperative receives a salmon allocation managed at the cooperative level. In order to allow for effective monitoring and management requirements, except for catcher vessels that deliver unsorted cod ends, participation in the pollock fishery for vessels will require a minimum of 100% observer coverage or video monitoring to ensure no at-sea discards. If the cooperative salmon cap is reached, the cooperative must stop fishing for pollock.

The initial allocation of salmon by cooperative within the inshore CV fleet is based upon the percent of total sector pollock catch their co-op allocation represents. The annual pollock quota for this fleet is divided up based upon application of a formula in the regulations for catch by cooperative per the specific sum of the catch history of the vessels the cooperative represents. Under 679.62(e)(1), the individual catch history of each vessel is equal to the vessel's best 2 of 3 years inshore pollock landings from 1995 through 1997 and includes landings to catcher/processors for vessels that made 500 or more mt landings to catcher/processors from 1995 through 1997. Each year, fishing permits are issued by cooperative with 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 the open access allocation under these circumstances.

The range of cooperative level allocations are based upon the 2008 pollock quota allocations and the options for the range of sector splits for the inshore CV fleet based upon component 2, options 1 and 2 applied to component 1 options 1 and 2 (Table 38–Table 41). For analytical purposes, the range of cooperative allocations will be analyzed using the ranges as indicated in Table 42 and Table 43.

**Table 38 Inshore cooperative allocations resulting from application of component 2, option 1 allocation to the inshore CV fleet (50% of allocation after 10% to CDQ)**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	58,176	26,179	8,154	300	2,482	753	3,192	6,350	4,949	0
ii)	76,252	34,313	10,687	393	3,253	987	4,183	8,323	6,487	0
iii)	147,204	66,242	20,631	759	6,280	1,905	8,076	16,068	12,524	0
iv)	203,080	91,386	28,462	1,047	8,664	2,628	11,141	22,167	17,277	0
v)	220,614	99,276	30,920	1,138	9,412	2,855	12,103	24,080	18,769	0
vi)	347,984	156,593	48,771	1,795	14,847	4,504	19,090	37,983	29,605	0
vii)	488,045	219,620	68,401	2,517	20,822	6,316	26,774	53,271	41,521	0

**Table 39 Inshore cooperative allocation resulting from application of component 2, option 2a allocation to the inshore CV fleet (average historical bycatch from 2004-2006)**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	58,176	50,031	15,582	573	4,743	1,439	6,099	12,136	9,459	0
ii)	76,252	65,577	20,424	752	6,217	1,886	7,994	15,906	12,398	0
iii)	147,204	126,595	39,428	1,451	12,003	3,641	15,433	30,707	23,934	0
iv)	203,080	174,649	54,394	2,001	16,558	5,023	21,291	42,363	33,019	0
v)	220,614	189,728	59,091	2,174	17,988	5,457	23,130	46,020	35,870	0
vi)	347,984	299,266	93,206	3,430	28,373	8,607	36,484	72,590	56,579	0
vii)	488,045	419,719	130,721	4,810	39,794	12,071	51,168	101,807	79,352	0



**Table 40 Inshore cooperative allocation resulting from application of component 2, option 2b allocation to the inshore CV fleet (average historical bycatch from 2002-2006)**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	58,176	48,868	15,220	560	4,633	1,405	5,957	11,853	9,239	0
ii)	76,252	64,052	19,949	734	6,073	1,842	7,809	15,536	12,110	0
iii)	147,204	123,651	38,511	1,417	11,723	3,556	15,074	29,993	23,378	0
iv)	203,080	170,587	53,129	1,955	16,173	4,906	20,796	41,378	32,251	0
v)	220,614	185,316	57,717	2,124	17,570	5,330	22,592	44,950	35,036	0
vi)	347,984	292,307	91,039	3,350	27,714	8,407	35,635	70,902	55,263	0
vii)	488,045	409,958	127,681	4,698	38,868	11,790	49,978	99,439	77,507	0

**Table 41 Inshore cooperative allocation resulting from application of component 2, option 2c allocation to the inshore CV fleet (average historical bycatch from 1997-2006)**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop	18.906% Westward Fleet coop	0.000% open access AFA vessels
i)	58,176	47,704	14,858	547	4,523	1,372	5,816	11,571	9,019	0
ii)	76,252	62,527	19,474	717	5,928	1,798	7,623	15,166	11,821	0
iii)	147,204	120,707	37,594	1,383	11,444	3,472	14,715	29,279	22,821	0
iv)	203,080	166,526	51,864	1,908	15,788	4,789	20,301	40,392	31,483	0
v)	220,614	180,903	56,342	2,073	17,151	5,203	22,054	43,880	34,202	0
vi)	347,984	285,347	88,871	3,270	27,054	8,207	34,787	69,214	53,948	0
vii)	488,045	400,197	124,641	4,586	37,943	11,510	48,788	97,072	75,661	0

**Table 42 Range of cooperative level caps for use in analysis of impacts of component 4 as applied to component 2, option 1**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							Westward Fleet coop	0.000% open access AFA vessels
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop			
i)	58,000	26,100	8,129	299	2,475	751	3,182	6,331	4,934	0	
ii)	206,300	90,585	28,213	1,038	8,588	2,605	11,043	21,972	17,126	0	
iii)	353,000	155,250	48,353	1,779	14,719	4,465	18,927	37,657	29,352	0	
iv)	488,000	219,600	68,394	2,517	20,820	6,316	26,771	53,266	41,518	0	

**Table 43 Cap ranges for analysis of hard cap component 2, option 2 (a-c) for component 4 cooperative provision**

Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector allocation	Inshore cooperative allocation:							Westward Fleet coop	0.000% open access AFA vessels
			31.145% Akutan CV Assoc	1.146% Arctic Enterprise Assoc	9.481% Northern Victor Fleet coop	2.876% Peter Pan Fleet coop	12.191% Unalaska coop	24.256% Unisea Fleet coop			
2a(i)	58,000	49,880	15,535	572	4,729	1,435	6,081	12,099	9,430	0	
2a(ii)	206,300	173,118	53,918	1,984	16,413	4,979	21,105	41,992	32,730	0	
2a(iii)	353,000	296,700	92,407	3,400	28,130	8,533	36,171	71,968	56,094	0	
2a(iv)	488,000	419,680	130,709	4,810	39,790	12,070	51,163	101,798	79,345	0	
2b(i)	58,000	48,720	15,174	558	4,619	1,401	5,939	11,818	9,211	0	
2b(ii)	206,300	169,092	52,664	1,938	16,032	4,863	20,614	41,015	31,969	0	
2b(iii)	353,000	289,800	90,258	3,321	27,476	8,335	35,330	70,294	54,790	0	
2b(iv)	488,000	409,920	127,670	4,698	38,865	11,789	49,973	99,430	77,499	0	
2c(i)	58,000	47,560	14,813	545	4,509	1,368	5,798	11,536	8,992	0	
2c(ii)	206,300	165,066	51,410	1,892	15,650	4,747	20,123	40,038	31,207	0	
2c(iii)	353,000	282,900	88,109	3,242	26,822	8,136	34,488	68,620	53,485	0	
2c(iv)	488,000	400,160	124,630	4,586	37,939	11,509	48,784	97,063	75,654	0	

### 2.2.4.1 Cooperative transfer options

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

**Option 1)** Lease their remaining pollock to another coop (inter-cooperative transfer) within their sector for that year (or similar method to allow pollock harvest with individual coop accountability)  
[placeholder for NOAA GC guidance on the specific provisions under which this can occur]

**Option 2)** Transfer salmon bycatch from other inshore cooperatives  
[placeholder for inserting information from NMFS on how cooperative transfers would work]

**Rollover suboption:** NMFS will rollover unused salmon bycatch to other sectors and inshore cooperatives still fishing  
[pull from component 3 option 2 discussion, NMFS]

## 2.3 Alternative 3: Fixed closures (non-Chinook)

Fixed closure management measures are pre-defined regulatory times and areas where pelagic pollock trawling would be prohibited.

The CDQ groups would be required to comply with any fixed closures that were established to reduce salmon bycatch. No salmon bycatch PSC limits would be established, so no allocations would be made to the CDQ Program or among the CDQ groups.

### Option 1: Area options

August B season candidate closure



**Figure 14** Previously proposed fixed area closure for August Pollock B season [Note areas no longer recommended for inclusion in alternatives]. Areas are composed by ADF&G statistical areas 685530 and 675530.

**Staff comments:** This closure configuration did not take into account the existing Chum SSA closure existing at the same time and therefore may be mis-specified. No August closures in addition to status quo (i.e retaining existing Chum SSAs) are proposed by staff at this time based upon catch rates for non-Chinook salmon and the timing of catch in the fishery. No fixed closures for non-Chinook salmon are proposed by staff at this time.

### **2.3.1.1.1 Suboption: Periodic adjustments to areas based on updated bycatch information.**

The Council will reassess updated salmon bycatch information after a certain number of years and determine if adjustments to any area options implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

## **2.4 Alternative 4: 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. The duration of the closure may vary according to stair-stepped cap levels whereby additional areas close (or reopen) depending on seasonal thresholds for species specific bycatch levels. Closures may involve a single area or multiple areas. Additional details on candidate closure areas and times are presented below.

Absent a subdivided cap, the CDQ Program would receive allocations of 7.5 percent of any BS Chinook salmon trigger cap and 10.7 percent of any non-Chinook salmon trigger cap as PSQ reserves. These PSQ reserves would be further allocated among the six CDQ groups based on percentage allocations approved by NMFS on August 8, 2005. Areas would close to directed pollock fishing for a particular CDQ group when that group's trigger cap is reached.

### **2.4.1 Component 1: Trigger Cap Formulation**

Cap formulation for trigger caps is equivalent to those under consideration for hard caps. See section 2.2.1 for additional information on how caps are to be formulated for this component.

### **2.4.2 Component 2: Sector Allocation**

Sector allocations are equivalent to those under consideration for hard caps. See section 2.2.2 for additional information on how caps are to be allocated by sector for this component.

### **2.4.3 Component 3: Sector Transfer**

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

**Option 2)** NMFS will rollover unused salmon bycatch to other sectors and other cooperatives still fishing [NMFS discussion on sector transfers to come]

### **2.4.4 Component 4: Area options**

**Staff proposals** for non-Chinook salmon closure configurations were based on spatial analysis of historical bycatch rates summarized by 10km square blocks. Here a longer time period was considered in designing closures (1991-2007) in order to account for the impact of various closures during this period, especially the Chum SSA closures in August, as well as closures during the period September 14-October 14 since 2002. In addition, data were broken out by periods prior to the invocation of regulatory closures (Figure 15) and also examined by individual year, particularly for years in which the exemption to regulatory closures were in place (2007 A season, 2006-2007 B seasons) as well as particular individual years of notable high bycatch (e.g., 1993, 2003, 2004, 2005 and 2006).

**Staff recommendations for triggered Chinook closures:**

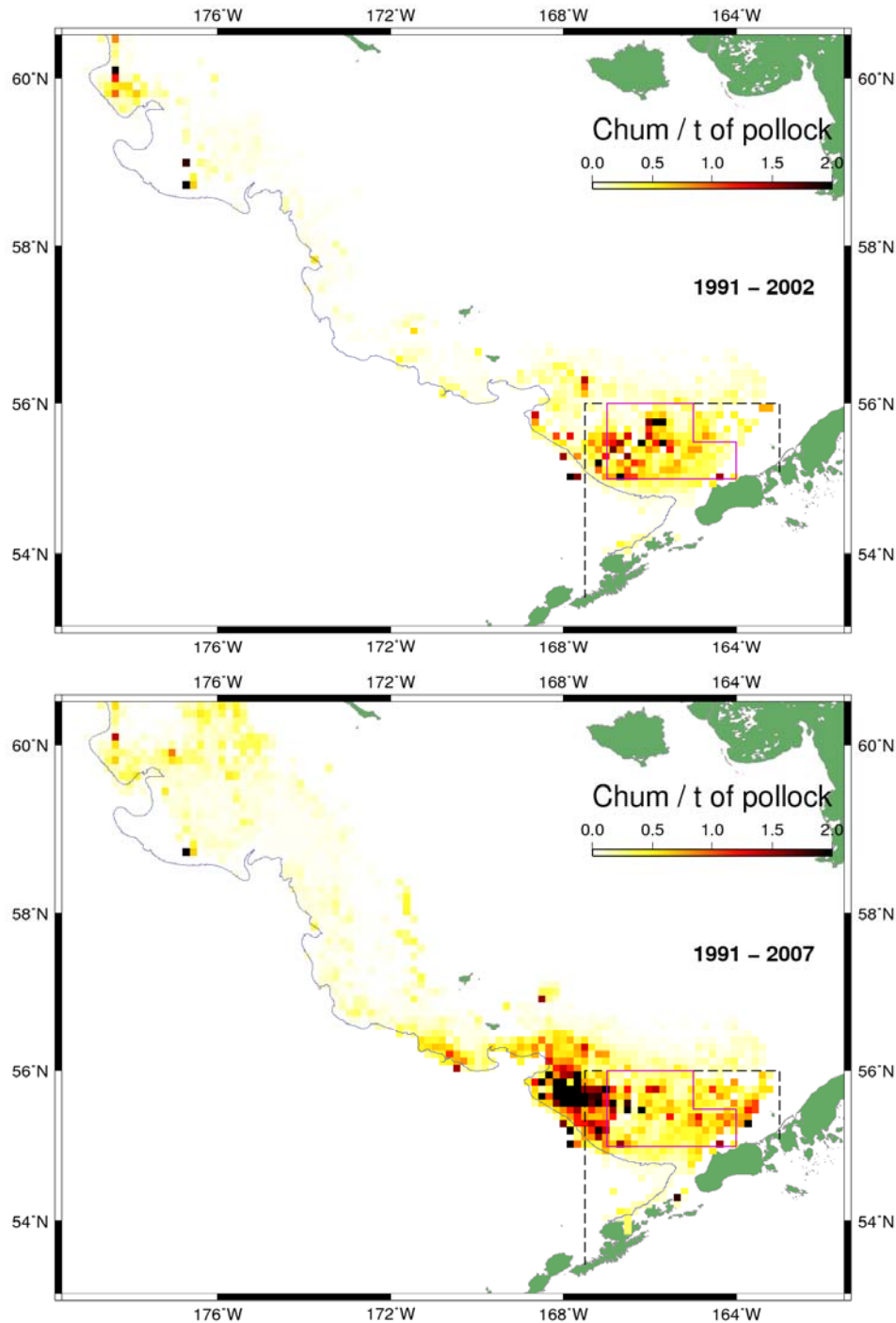
Three B season closures are put forward as triggered closure options for non-Chinook salmon. Further details on the areas, amount of pollock per Chinook catch seasonally and by week as well as the proposed proportion of the trigger and timing of closure thereof are listed for each configuration. Closures are reorganized as B season options. Each closure option as presented may be considered as a single closure option as listed, as well as a part of a package of expanding area closure option as noted in the options listed.

Option 1: Areas (note all B season closures for non-Chinook)

- ~~i. Adjust area according to the number of salmon caught~~
- ~~ii. Single area closure~~
- ~~iii. Multiple area closures~~

~~Candidate areas (need to fold into above)~~

- ~~i. August B season candidate closure~~



**Figure 15 Historical chum B-season bycatch rates 1991-2002 (top panel) relative to CVOA and Chum salmon savings area (similar to data used to derive original area determination) compared to data from 1991-2007 (lower panel).**

Given additional analysis of chum bycatch rates over the historical and recent time periods and in consideration of years of variable bycatch of non-Chinook salmon, **staff recommends the following three closure areas be folded into the analysis as triggered closures for non-Chinook salmon.** These

closures would be considered as separate triggered closures individually as well as collectively as a stair-step expanding closure option in the alternatives.

**Option 1a) Small closure.** This closure was identified by rate-based analysis delineating regions where average bycatch rate exceeded 0.9 chum salmon per ton of pollock (Figure 16). 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 (Table 50)

**Table 44 Option 1a) Small 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'

As a single closure option, the trigger for this region would be formulated as follows:  
[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

**Option 1b) Medium closure.** This closure was identified by rate-based analysis delineating regions where the average bycatch rate exceeded 0.5 chum salmon per ton of pollock over the time period considered (Figure 16). Over the entire B season, this area accounts for 77% of the chum salmon on average (1993-2007) and 45% of the pollock catch (Table 49).

**Table 45 Option 1b) Medium area closure coordinates**

56° 08'	163° 00'	56° 53'	171° 8'
54° 53'	164° 8'	56° 30'	170° 00'
54° 23'	166° 8'	56° 45'	167° 53'
56° 00'	169° 23'	56° 15'	165° 30'
56° 00'	170° 53'	56° 38'	164° 8'
56° 30'	172° 30'	56° 08'	163° 00'

As a single closure option, the trigger for this region would be formulated as follows:  
[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

**Option 1c) Large closure.** This closure was identified by rate-based analysis delineating regions where the average bycatch rate exceeded 0.1 chum salmon per ton of pollock over the time period considered (Figure 16). Over the entire B season, this area accounts for 92% of the chum salmon on average (1993-2007) and 84% of the pollock catch (Table 48).

**Table 46 Option 1c) Large area closure coordinates**

57° 08'	171° 00'	55° 08'	163° 53'	57° 45'	174° 00'	60° 30'	175° 15'
57° 08'	167° 53'	54° 30'	165° 45'	58° 38'	175° 00'	59° 00'	172° 38'
56° 45'	167° 53'	55° 00'	167° 45'	58° 38'	176° 38'	58° 30'	172° 38'
56° 15'	165° 23'	55° 53'	169° 23'	59° 23'	178° 23'	58° 30'	171° 15'
56° 30'	163° 38'	56° 00'	170° 53'	60° 00'	179° 00'	57° 08'	171° 00'
56° 08'	163° 00'	56° 38'	172° 30'	60° 30'	179° 00'		
55° 45'	163° 00'	57° 00'	174° 00'				

As a single closure option, the trigger for this region would be formulated as follows:  
[Additional information on the proportional trigger cap level for all closures will be provided in the Council briefing materials].

**Option 2) Expanding area closure.** This closure option takes all three areas collectively as an expanding area closure. A stair-step trigger cap limit closes each area as threshold trigger levels are reached. This stair-step begins with the closure of area 1a at trigger level 1, then if bycatch continues and trigger level 2 is reached, area 1b closes. If bycatch continues high enough to reach trigger level 3, then area 1c closes. Additional information will be provided in the Council briefing materials with respect to how these specific proportional trigger levels would be formulated.



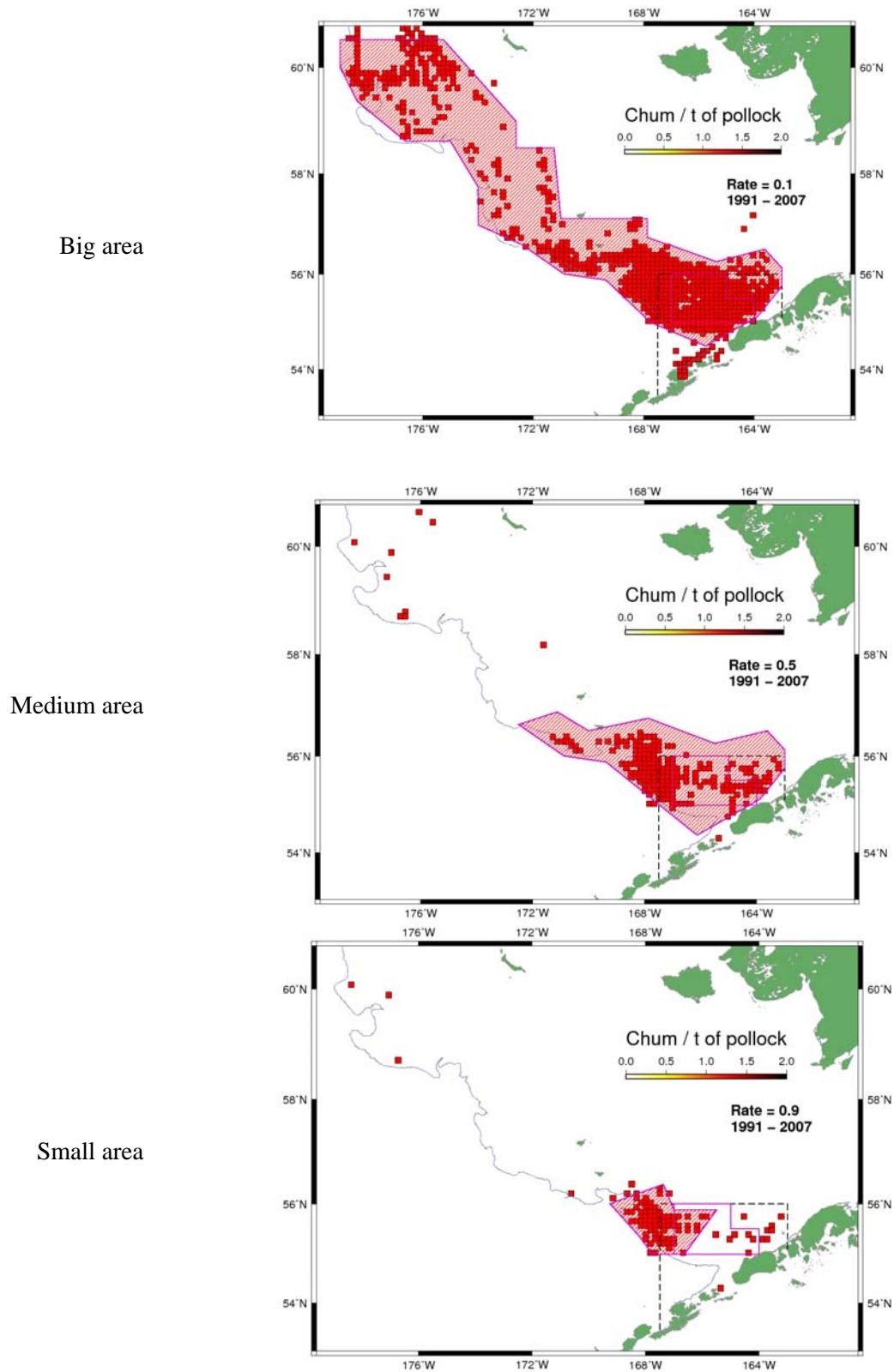


Figure 16 B-season chum salmon proposed closures over different rates based on 1991-2007 NMFS observer data. Filled in 10x10km cells represent locations where the average bycatch rate exceeded 0.1 chum salmon

per t of pollock (top panel), 0.5 chum per t of pollock (middle panel) and 0.9 (bottom panel).

**Table 47 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).**

<b>Periods</b>	<b>Seasonal pollock proportion</b>	<b>Seasonal "other" salmon proportion</b>	<b>Seasonal effort proportion</b>
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 48 Average 1993-2007 seasonal pattern of other salmon bycatch per t of pollock in and outside of candidate closure areas (big, medium, and small) by different periods.**

Area	Periods	Rate In	Rate Outside	Pollock inside	Chum Inside	Effort Inside
<b>Big</b>	<b>All of B season</b>	<b>0.222</b>	<b>0.099</b>	<b>84%</b>	<b>92%</b>	<b>81%</b>
Big	Jun 1-7	0.000	0.339	0%	0%	0%
Big	Jun 8-14	0.191	0.160	82%	85%	63%
Big	Jun 15-21	0.285	0.166	91%	94%	82%
Big	Jun 22-30	0.176	0.087	90%	95%	89%
Big	Jul 1-7	0.185	0.822	91%	68%	86%
Big	Jul 8-14	0.101	0.527	94%	76%	90%
Big	Jul 15-21	0.321	0.234	95%	96%	93%
Big	Jul 22-31	0.182	0.051	93%	98%	93%
Big	Aug 1-7	0.416	0.065	89%	98%	89%
Big	Aug 8-14	0.201	0.045	93%	98%	92%
Big	Aug 15-21	0.302	0.034	89%	99%	88%
Big	Aug 22-31	0.143	0.057	89%	95%	87%
Big	Sep 1-7	0.235	0.052	80%	95%	78%
Big	Sep 8-14	0.247	0.056	80%	94%	77%
Big	Sep 15-21	0.253	0.083	77%	91%	75%
Big	Sep 22-30	0.152	0.088	78%	86%	76%
Big	Oct 1-7	0.222	0.080	69%	86%	66%
Big	Oct 8-14	0.260	0.057	71%	92%	68%
Big	Oct 15-21	0.245	0.068	74%	91%	72%
Big	Oct 22-31	0.178	0.018	83%	98%	79%

**Table 49 Average 1993-2007 seasonal pattern of other salmon bycatch per t of pollock in and outside of candidate closure areas (big, medium, and small) by different periods.**

Area	Periods	Rate In	Rate Outside	Pollock inside	Chum Inside	Effort Inside
Medium	All of B	0.350	0.084	45%	77%	46%
Medium	Jun 1-7	0.000	0.339	0%	0%	0%
Medium	Jun 8-14	0.217	0.124	66%	78%	47%
Medium	Jun 15-21	0.376	0.117	61%	83%	54%
Medium	Jun 22-30	0.290	0.034	52%	90%	51%
Medium	Jul 1-7	0.375	0.152	42%	64%	41%
Medium	Jul 8-14	0.220	0.063	40%	70%	40%
Medium	Jul 15-21	0.794	0.049	36%	90%	35%
Medium	Jul 22-31	0.454	0.033	33%	87%	35%
Medium	Aug 1-7	0.978	0.035	36%	94%	38%
Medium	Aug 8-14	0.422	0.031	41%	90%	42%
Medium	Aug 15-21	0.487	0.125	41%	73%	45%
Medium	Aug 22-31	0.192	0.091	42%	60%	43%
Medium	Sep 1-7	0.318	0.108	43%	69%	44%
Medium	Sep 8-14	0.292	0.133	47%	66%	49%
Medium	Sep 15-21	0.317	0.102	52%	77%	53%
Medium	Sep 22-30	0.210	0.079	45%	68%	47%
Medium	Oct 1-7	0.298	0.072	47%	78%	48%
Medium	Oct 8-14	0.325	0.059	54%	86%	54%
Medium	Oct 15-21	0.302	0.053	59%	89%	58%
Medium	Oct 22-31	0.206	0.049	65%	89%	62%

**Table 50 Average 1993-2007 seasonal pattern of other salmon bycatch per t of pollock in and outside of candidate closure areas (big, medium, and small) by different periods.**

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

#### 2.4.4.1.1 Suboption: Periodic adjustments to areas based on updated bycatch information.

The Council will reassess updated salmon bycatch information after a certain number of years and determine if adjustments to any area options implemented under this action are needed. If the Council selects this option, it would specify when the reassessment of salmon bycatch information would occur. Any revisions to the salmon bycatch management measures would require additional analysis and rulemaking. The Council may reassess any management measure at any time and does not need to specify a particular time for reassessment of the salmon bycatch management measures.

### 3.0 COMPARISON OF ALTERNATIVES

This section will be provided in the briefing materials for the April Council meeting. It will contain comparative information across alternatives, components and options pertinent to the impact analysis of these alternatives as well as graphic information (e.g. tables and flowcharts) intended to assist the Council in identifying a preferred alternative by species.

**APPENDIX 1: COUNCIL MOTION FROM FEBRUARY 2008****D-1(a) BSAI Salmon Bycatch Motion**

The Council forwards the problem statement and alternatives and options as provided in the February 2008 D-1(a) staff discussion paper for analysis with the following revisions. Additions are underlined and deletions are shown in strikethrough.

Replace the current problem statement present in December analysis with the following:

An effective approach to salmon prohibited species bycatch reduction in the Bering Sea pollock trawl fishery is needed. Current information suggests these harvests include stocks from Asia, Alaska, Yukon, British Columbia, and lower-48 origin. Chinook salmon are a high-value species extremely important to Western Alaskan village commercial and subsistence fishermen and also provide remote trophy sport fishing opportunities. Other salmon (primarily made up of chum salmon) harvested as bycatch in the Bering Sea pollock trawl fishery also serve an important role in Alaska subsistence fisheries. However, in response to low salmon runs, the State of Alaska has been forced to close or greatly reduce some commercial, subsistence and sport fisheries in Western Alaska. Reasons for reductions in the number of Chinook salmon returning to spawn in Western Alaska rivers and the Canadian portion of the Yukon River drainage are uncertain, but recent increases Bering Sea bycatch may be a contributing factor.

Conservation concerns acknowledged by the Council during the development of the Salmon Savings Areas have not been resolved. Continually increasing Chinook salmon bycatch indicates the VRHS under the salmon bycatch intercooperative agreement approach is not yet sufficient on its own to stabilize, much less, reduce the total bycatch. Hard caps, area closures, and/or other measures may be needed to reduce salmon bycatch to the ~~maximum~~ extent practicable under National Standard 9 of the MSA. We recognize the MSA requires use of the best scientific information available. The Council intends to develop an adaptive management approach which incorporates new and better information as it becomes available. Salmon bycatch must be reduced to address the Council's concerns for those living in rural areas who depend on local fisheries for their sustenance and livelihood and to contribute towards efforts to reduce bycatch of Yukon River salmon under the U.S./Canada Yukon River Agreement obligations.

**Option 1 (applies to Alternatives 2 and 4):**

Modify the PSC accounting period to begin at the start of the B season in one calendar year and continue through the A season of the following calendar year (if this option is not selected, the accounting period is the calendar year).

**Option 2 (applies to Alternatives 3 and 4 only):**

Exempt those vessels participating in a VRHS system from area closures.

**Alternative 1: Status Quo****Alternative 2: Hard Cap****Option 1: Hard cap based upon average historical bycatch (1997-2006)****Sub-****option Description**

	<b>Chinook</b>	<b>Chum</b>
i) 3 year average (2004-2006)	68,392	498,733
ii) 5 year average (2002-2006)	57,333	355,194
iii) 10 year average (1997-2006)	43,328	207,620
iv) 10 year average (1997-2006): drop lowest year	47,591	225,515
v) 10 year average (1997-2006): drop highest year	38,891	151,585
vi) 10% increase of historical average (3 years, 2004-2006)	75,231	548,607
vii) 20% increase of historical average (3 years, 2004-2006)	82,070	598,480
viii) 30% increase of historical average (3 years, 2004-2006)	88,909	648,353
ix) 10% increase of highest year (pre-2007)	91,583	783,133
x) 20% increase of highest year (pre-2007)	99,908	854,327
xi) 30% increase of highest year (pre-2007)	108,234	925,521

**Option 2: Cap set relative to salmon returns****Option 3: Cap set based on Incidental Take Permit amount**

This involves setting the Chinook (only) cap at 87,500 fish.

**Option 4: Set cap in accordance with International treaty considerations relative to bycatch levels pre-accession to the Yukon River Agreement (1992-2001, based on average historical bycatch pre-2002)****Sub-****option**

<b>Description</b>	<b>Chinook</b>	<b>Chum</b>
i) 3 year average (1999-2001)	16,795	55,542
ii) 5 year average (1997-2001)	29,323	60,046
iii) 10 year average (1992-2001)	32,482	77,943

**Analysis of hard cap levels**

For analysis, spread the range of estimated bycatch under Options 1, 3, and 4 and select four equally spaced numbers for analysis, approximately as follows:

	<u>Chinook</u>	<u>Chum</u>
<u>Analysis point 1</u>	<u>29,323</u>	<u>60,046</u>
<u>Analysis point 2</u>	<u>48,715</u>	<u>206,275</u>
<u>Analysis point 3</u>	<u>68,108</u>	<u>352,504</u>
<u>Analysis point 4</u>	<u>87,500</u>	<u>498,733</u>

**Option 5: Divide the final cap by sectors based on**

i) 10% of the cap to the CDQ sector, and the remaining allocated as follows: 50% shore based CV fleet; 10% for the mothership fleet; and 40% for the offshore CP fleet

ii) Historical average of percent bycatch by sector based on 3, 5, and 10 year averages (see Alternative 2, Option 1 for range of years)

Transfer suboptions:

i) Transfer salmon bycatch among sectors (industry initiated)

ii) NMFS will rollover unused salmon bycatch to other sectors and ~~inshore~~ **other** cooperatives still fishing

**Option 6: Divide the sector cap by cooperative based upon the percent of total sector pollock catch their coop allocation represents. Except for catcher vessels that deliver unsorted cod end, participation in pollock fishery for vessels will require a minimum of 100% observer coverage or video monitoring to ensure no at-sea discards. When ~~the Chinook~~ a salmon coop cap is reached, the coop must stop fishing for pollock and may:**

i) Lease their remaining pollock to another coop (inter-cooperative transfer) within their sector for that year (or similar method to allow pollock harvest with individual coop accountability)

ii) ~~Purchase~~ Transfer salmon bycatch from other inshore cooperatives

Rollover suboption: NMFS will rollover unused salmon bycatch to other sectors and inshore cooperatives still fishing

**Option 7: Periodic adjustment for updated bycatch information**

A time period may be specified after which caps may be re-specified with updated bycatch data.

**Alternative 3: Fixed closures**

**Option 1: Timing options**

i. A season (Chinook only)

ii. B season (Chinook and Chum)

**Option 2: Area options**

**Option 3: Periodic adjustment for updated bycatch information**

A period may be specified after which areas may be re-specified with updated bycatch data.

**Alternative 4: Triggered closures**

**Option 1: Timing options**

i. A season

ii. B season

**Option 2: Area options**

i. Adjust area according to the number of salmon caught

ii. Single area closure

iii. Multiple area closures

**Option 3: Periodic adjustment for updated bycatch information**

A time period may be specified after which areas may be re-specified with updated bycatch data.

**Option 4: Trigger Cap formulation**

See Alternative 2 for description of cap formulation options.

**Option 5: Divide the final cap by sectors based on:**

i) 10% of the cap to the CDQ sector, and the remaining allocated as follows: 50% shore based CV fleet; 10% for the mothership fleet; and 40% for the offshore CP fleet

ii) Historical average of percent bycatch by sector based on 3, 5, and 10 year averages (see Alternative 2, Option 1 for range of years)

Transfer suboptions:



- i) Transfer salmon bycatch among sectors (industry initiated)
- ii) NMFS will rollover unused salmon bycatch to other sectors and inshore cooperatives still fishing

**Option 6: ~~Divide the sector cap by cooperative based upon the percent of total sector pollock catch their coop allocation represents. When the Chinook salmon coop cap is reached, the coop must stop fishing for pollock and may:~~**

- i) ~~Lease their remaining Pollock to another coop (inter-cooperative transfer) within their sector for that year (or similar method to allow pollock harvest with individual coop accountability)~~
- ii) ~~Purchase salmon bycatch from other cooperatives.~~

### **Candidate closures for Alternatives 3 and 4**

#### **1) Closures areas defined by historic effort**

- 1a) Fixed A season closure (Chinook)
- 1b) Sequential two-week A season closures (Chinook)
- 1c) Sequential two-week B season closures (Chinook)
- 1d) August B season closure (Chum)

#### **2) Candidate Closure areas defined by rate-based criteria**

- 2a) Rate-based criteria 0.10 Chinook/pollock (t)
- 2b) Rate-based criteria 0.125 Chinook/pollock (t)
- 2c) Rate-based criteria 0.15 Chinook/pollock (t)
- 2d) Rate-based criteria 0.175 Chinook/pollock (t)
- 2e) Rate-based criteria 0.20 Chinook/pollock (t)
- ~~2e) Rate-based criteria 0.30 Chinook/pollock (t)~~
- ~~2d) Rate-based criteria 0.40 Chinook/pollock (t)~~

#### **3) Candidate Closure areas defined by percent bycatch reduction criteria**

- 3a) 50% bycatch reduction closure
- 3b) 75% bycatch reduction closure

The Council request staff further develop a discussion paper to reduce BSAI salmon bycatch in the pollock trawl fishery through market mechanisms such as including, but not limited to, per salmon fees (likely administered by industry) or forced transfer of some increment of pollock for each salmon harvested. This discussion paper should include an overview of legal concerns, possible fee collection and use options, and management/administrative concerns.

The Council requests that industry present additional candidate closure areas at the April 2008 meeting.

**APPENDIX 2: SALMON MORTALITY BY SPECIES 1992-2007**

Chinook salmon mortality in BSAI groundfish fisheries (all gear and targets)

Year	Annual	Annual	Annual	A season	B season	A season	B season
	with CDQ	without CDQ	CDQ report	with CDQ	with CDQ	without CDQ	without CDQ
1991	48,880			46,392	2,488		
1992	41,955			31,419	10,536		
1993	46,014			24,688	21,326		
1994	43,821			38,921	4,900		
1995	23,436			18,939	4,497		
1996	63,205			43,316	19,888		
1997	50,530			16,401	34,129		
1998	55,431			18,930	36,501		
1999	13,521	12,937	584			8,205	4,732
2000	8,223	7,474	749			6,138	1,336
2001	40,547	37,986	2,561			23,093	14,893
2002	39,684	37,581	2,103			24,859	12,722
2003	55,422	52,709	2,713			39,755	12,954
2004	63,188	60,178	3,010			31,157	29,021
2005	74,967	72,911	2,056			32,850	40,061
2006	87,730	85,940	1,790			61,577	24,363
2007	130,139	124,495	5,644			74,377	50,119

Notes: Data for 1991-1997 from bsahalx.dbf found at G:\YYYY; includes CDQ  
 Data for 1998 from bsahalx98.dbf and boatrate98.dbf (CDQ)  
 Data for 1999 - 2002 from bsahalx.dbf plus the CDQ values found at  
<http://www.fakr.noaa.gov/cdq/daily/cdqctd07.pdf> for 1999-2002.  
 Data for 2003 - 2007 from psnq\_estimate table plus the CDQ values found at  
<http://www.fakr.noaa.gov/cdq/daily/cdqctd07.pdf>.  
 Pollock CDQ 1992-1998; multi-species CDQ 1998-2007  
 A season - January 1 to June 10  
 B season - June 11 to December 31  
 Retrieval done 1/11/2008

Chinook salmon mortality in BSAI groundfish fisheries (pelagic trawl gear only)

Year	Annual with CDQ	Annual without CDQ	Annual CDQ only	A season without CDQ	B season without CDQ	A season CDQ only	B season CDQ only	A season all	B season all
1992	35,950	na	na	na	na	na	na	25,691	10,259
1993	38,516	na	na	na	na	na	na	17,264	21,252
1994	33,136	30,592	2,544	26,871	3,722	1,580	964	28,451	4,686
1995	14,984	12,978	2,006	9,924	3,053	655	1,351	10,579	4,405
1996	55,623	53,220	2,402	34,780	18,441	1,289	1,114	36,068	19,554
1997	44,909	42,437	2,472	9,449	32,989	1,487	985	10,935	33,973
1998	51,322	51,322	0	15,193	36,130	0	0	15,193	36,130
1999	11,978	10,381	1,597	5,768	4,614	584	1,013	6,352	5,627
2000	4,961	4,242	719	2,992	1,250	430	289	3,422	1,539
2001	33,444	30,937	2,507	16,711	14,227	1,773	734	18,484	14,961
2002	34,495	32,402	2,093	20,378	12,024	1,416	677	21,794	12,701
2003	46,993	44,428	2,565	32,115	12,313	1,693	872	33,808	13,185
2004	54,028	51,062	2,966	22,821	28,241	1,140	1,826	23,961	30,067
2005	67,890	65,957	1,933	26,377	39,580	1,296	637	27,673	40,217
2006	83,257	81,520	1,737	57,320	24,201	1,580	157	58,900	24,358
2007	122,073	116,453	5,620	66,430	50,023	3,091	2,529	69,521	52,552

Notes: Data for 1992-2002 from bsahalx.dbf found at G:\YYYY; includes CDQ

Data for 2003 - 2007 from psnq\_estimate table plus the CDQ values found in bsahalx.dbf

Pollock CDQ 1992-1998; multi-species CDQ 1998-2007

A season - January 1 to June 10

B season - June 11 to December 31

Data retrieval done 01/16/2008

Non-Chinook salmon mortality in BSAI groundfish fisheries (all gear and targets)

Year	Annual	Annual	Annual	A season	B season	A season	B season
	with CDQ	without CDQ	CDQ report	with CDQ	with CDQ	without CDQ	without CDQ
1991	30,262			3,016	27,246		
1992	41,450			2,120	39,329		
1993	243,270			1,848	241,422		
1994	94,548			5,599	88,949		
1995	21,875			3,033	18,842		
1996	78,060			665	77,395		
1997	66,994			2,710	64,285		
1998	66,612	65,697	915	4,608	62,004		
1999	46,568	46,325	243			378	45,947
2000	59,327	57,621	1,706			283	57,338
2001	60,731	57,440	3,291			2,719	54,721
2002	82,483	78,879	3,604			1,677	77,202
2003	197,287	188,885	8,402			4,052	184,833
2004	457,817	447,393	10,424			1,015	446,378
2005	711,938	703,547	8,391			1,008	702,540
2006	326,445	325,065	1,380			3,483	321,583
2007	98,140	90,948	7,192			8,504	82,444

Notes: Data for 1991-1997 from bsahalx.dbf found at G:\YYYYY; includes CDQ  
 Data for 1998 from bsahalx98.dbf and boatrate98.dbf (CDQ)  
 Data for 1999 - 2002 from bsahalx.dbf plus the CDQ values found at  
<http://www.fakr.noaa.gov/cdq/daily/cdqctd07.pdf> for 1999-2002  
 Data for 2003 - 2007 from psnq\_estimate table plus the CDQ values found at  
<http://www.fakr.noaa.gov/cdq/daily/cdqctd07.pdf> for 1999-2002  
 Pollock CDQ 1992-1998; multi-species CDQ 1998-2007  
 A season - January 1 to June 10  
 B season - June 11 to December 31  
 Retrieval done 1/11/2008

Non-chinook salmon mortality in BSAI groundfish fisheries (pelagic trawl gear only)

Year	Annual with CDQ	Annual without CDQ	Annual CDQ only	A season without CDQ	B season without CDQ	A season CDQ only	B season CDQ only	A season all	B season all
1992	40,274	na	na	na	na	na	na	1,951	38,324
1993	242,191	na	na	na	na	na	na	1,594	240,597
1994	92,672	77,637	15,036	3,682	73,954	309	14,727	3,991	88,681
1995	19,264	18,678	585	1,578	17,100	130	456	1,708	17,556
1996	77,236	74,977	2,259	177	74,800	45	2,214	222	77,014
1997	65,988	61,759	4,229	1,991	59,767	92	4,137	2,083	63,904
1998	64,042	64,042	0	4,002	60,040	0	0	4,002	60,040
1999	45,271	44,610	661	349	44,261	13	648	362	44,909
2000	58,571	56,867	1,704	148	56,719	65	1,639	213	58,358
2001	57,007	53,904	3,103	2,213	51,691	173	2,930	2,386	54,621
2002	80,652	77,178	3,474	1,356	75,821	21	3,453	1,377	79,274
2003	195,135	186,779	8,356	3,709	183,070	237	8,119	3,946	191,189
2004	447,626	437,429	10,197	409	437,019	29	10,168	438	447,187
2005	705,963	698,270	7,693	567	697,703	32	7,661	599	705,364
2006	310,545	309,343	1,202	2,460	306,883	65	1,137	2,525	308,020
2007	94,063	87,583	6,480	7,367	80,216	1,156	5,324	8,523	85,540

Notes: Data for 1992-2002 from bsahalx.dbf found at G:\YYYY; includes CDQ

Data for 2003 - 2007 from psnq\_estimate table plus the CDQ values found in bsahalx.dbf

Pollock CDQ 1992-1998; multi-species CDQ 1998-2007

A season - January 1 to June 10

B season - June 11 to December 31

Data retrieval done 01/16/2008