Public Testimony Sign-Up Sheet

Agenda Item D-2 (c) BSAI Chum Salmon Bycatch

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NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person " to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.

AGENDA D-2
DECEMBER 2008

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

DATE: December 2, 2008

SUBJECT: Miscellaneous Groundfish Management

ESTIMATED TIME
6 HOURS
all D-2 items

ACTION REQUIRED

~~(a) Committee report on comprehensive data collection (T)~~
(b) Discussion paper on changes to GOA Rockfish Program
(c) Discussion paper on BSAI Chum Salmon Bycatch alternatives (Council only)
(d) Discussion paper on GOA salmon and crab bycatch

BACKGROUND

~~(a) Committee report on comprehensive data collection~~

(b) Discussion paper on changes to GOA Rockfish Program

At its June 2008 meeting, the Council received a paper reviewing the performance of the Central Gulf of Alaska rockfish pilot program in its first year. On receiving the report, public testimony, and recommendations of the Advisory Panel, the Council requested staff to prepare a discussion paper examining certain possible changes to the program, including:

1) A possible amendment to qualify persons with Central Gulf rockfish history who acquired a license to remain eligible to fish in the Central Gulf fisheries.
2) The use of a harvester only cooperative for the entry level trawl fishery and other possible mechanisms that could be used to control effort in the entry level trawl fishery.
3) Additional options to rollover catch from the fixed gear entry level fishery to the trawl entry level fishery, including various dates for the rollover and different allocations to the fisheries.
4) A change in the management of shortraker in the catcher processor sector from an allocation to a maximum retainable amount (MRA).
5) A change in the management of MRAs under the program to include catch of allocated secondary species in the basis for determining the MRA of a species that is not allocated.
6) A change in the management of halibut PSC in the entry level trawl fishery.

The attached paper examines these changes, as well as the process for development of a possible amendment package (Item D-2(b)). In particular, the time for analysis and implementation of the suggested amendments could be protracted, resulting in only a single year of fishing under the revisions prior to the 5 year sunset of the program.

(c) Discussion paper on BS Chum Salmon Bycatch alternatives

At the April 2008 Council meeting, the Council took action to bifurcate the analysis of management measures for Chinook and chum salmon.to evaluate them separately. The EIS/RIR/IRFA for Chinook salmon bycatch management measures was presented for initial review in June 2008 at which time the Council selected its preliminary preferred alternative (PPA). The analysis was subsequently revised by staff and the draft EIS/RIR/IRFA then published by NMFS on December 5, 2008.

The DEIS/RIR/IRFA is accessible electronically through the NMFS Alaska Region's website at http://alaskafisheries.noaa.gov/sustainablefisheries/bycatch/default.htm. Additional CDs or printed copies of the DEIS/RIR/IRFA may be requested from this website. The comment period for the draft EIS/RIR/IRFA ends on February 3, 2009. There is no action by the Council on Chinook at this meeting. Final action on the Chinook salmon bycatch management measures is scheduled for April 2009.

For Chum salmon bycatch management measures, the Council modified the existing suite of alternatives and scheduled further review of the alternatives and plans for analysis at this meeting. A discussion paper was mailed out on November 12th and is attached as Item D-2(c)(1). This discussion paper summarizes the current bycatch trends by season and sector, the current suite of alternatives, and information about staff availability and timing to complete the analysis. Updated tables of chum salmon mortality by year, season and sector are attached as Item D-2(c)(2) and Item D-2(c)(3).

At this meeting, the Council will review the current suite of alternatives for chum (non-Chinook) salmon bycatch in the Bering Sea pollock trawl fishery as amended in April 2008. The Council may modify the alternatives at this time, develop a problem statement, and discuss an appropriate timeline for this analysis. The AP reviewed this paper in October 2008. Their minutes on this agenda item are attached as Item D-2(c)(4). A draft action plan for this analysis has been developed and is attached at Item D-2(c)(5). Information included in this action plan are relative timelines for Chinook actions and subsequent rulemaking, potential time line for the non-Chinook analysis as well as considerations for the Council regarding information availability and development of an outreach plan for the non-Chinook analysis.

A letter to the Council from NMFS regarding the analysis and a draft Notice of Intent (NOI) to prepare an EA or an EIS for this analysis is attached as Item D-2(c)(6). This NOI contains a preliminary range of alternatives per Council's April 2008 suite of alternatives as well as suggestions that the Council consider the addition of an alternative similar to its preferred alternative for Chinook once that alternative is selected in April 2009, and that the Council discuss whether to continue to fully analyze Alternative 3 for triggered area closures.

(d) Discussion paper on GOA salmon and crab bycatch

In June 2008, the Council asked staff to focus the discussion paper on salmon and crab bycatch in the groundfish fisheries to particular species and areas with potentially high bycatch levels: Chinook salmon and *Chinoecetes bairdi* Tanner crab, in the central and western GOA. Also, the Council asked staff to identify strawman closure areas for Chinook salmon and Tanner crab. A revised discussion paper was mailed out to the Council in mid-November, and is attached here (Item D-2(d)). It provides a general overview of the updated information on bycatch levels, directed fisheries, and species abundance. Preliminary alternatives have been proposed for bycatch management measures in previous iterations of this discussion paper, and they are included here, along with strawman target areas representing areas with high bycatch rates. At this meeting, the Council will review the discussion paper, and if appropriate, initiate an analysis, with a problem statement and alternatives.

Discussion paper on an amendment package
Central Gulf of Alaska rockfish pilot program
North Pacific Fishery Management Council
December 2008

At its June 2008 meeting, the Council received a report from staff reviewing the first year performance of the Central Gulf of Alaska rockfish pilot program. On receiving the report and public testimony, the Council requested staff to prepare a discussion paper examining possible changes to the program. The Council specifically requested staff to examine the following aspects of the Central Gulf of Alaska rockfish pilot program:

1) A possible amendment to the program providing that:

> A person who operated a vessel in the Central Gulf of Alaska rockfish fisheries during the 1996-2002 period under an interim License Limitation Program licence that was determined after such period to have an invalid Central Gulf of Alaska trawl gear endorsement, who then acquired an additional LLP license with a valid Central Gulf of Alaska trawl gear endorsement and assigned it to such vessel by December 31, 2003, shall be eligible to receive Rockfish Quota Share under the Rockfish Pilot Program based on the catch history of such vessel, notwithstanding the invalidity of the interim Central Gulf trawl LLP endorsement under which the vessel operated during the 1996-2002 period. Rockfish Quota Share allocated under this provision shall be assigned to the additional LLP license.

In the discussion of this provision, the Council requested staff to include a discussion of the removal of a similar provision from the alternatives considered when the pilot program was originally adopted and a discussion of any catcher vessel and catcher processor licenses that might be affected by this or a similar provision.

2) The use of a harvester only cooperative for the entry level trawl fishery and other possible mechanisms that could be used to control effort in the entry level trawl fishery.

3) Additional options to rollover catch from the fixed gear entry level fishery to the trawl entry level fishery, including various dates for the rollover and different allocations to the fisheries.

4) A change in the management of shortraker in the catcher processor sector from an allocation to a maximum retainable amount (MRA).

5) A change in the management of MRAs under the program to include catch of allocated secondary species in the basis for determining the MRA of a species that is not allocated.

At its October 2008 meeting, the Council requested staff to examine an additional aspect of the program in the discussion paper, specifically:

> A change that would either a) provide an exclusive halibut PSC allocation to the entry level trawl fishery or b) exempt halibut PSC mortality of the entry level trawl fishery from any limit on halibut mortality.

This paper is staff's response to these Council requests.

Background

In the 2003, the U.S. Congress directed the Secretary of Commerce to establish, in consultation with the Council, a pilot program for management of the rockfish fisheries in the Central Gulf of Alaska (the Central Gulf).[1] Specifically, Congress passed the following legislation:

> SEC. 802. GULF OF ALASKA ROCKFISH DEMONSTRATION PROGRAM. The Secretary of Commerce, in consultation with the North Pacific Fishery Management Council, shall establish a pilot program that recognizes the historic participation of fishing vessels (1996 to 2002, best 5 of 7 years) and historic participation of fish processors (1996 to 2000, best 4 of 5 years) for pacific ocean perch, northern rockfish, and pelagic shelf rockfish harvested in Central Gulf of Alaska. Such a pilot program shall (1) provide for a set-aside of up to 5 percent for the total allowable catch of such fisheries for catcher vessels not eligible to participate in the pilot program, which shall be delivered to shore-based fish processors not eligible to participate in the pilot program; (2) establish catch limits for non-rockfish species and non-target rockfish species currently harvested with pacific ocean perch, northern rockfish, and pelagic shelf rockfish, which shall be based on historical harvesting of such bycatch species. The pilot program will sunset when a Gulf of Alaska Groundfish comprehensive rationalization plan is authorized by the Council and implemented by the Secretary, or 2 years from date of implementation, whichever is earlier.

Although originally subject to a sunset after 2 years, the 2007 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (the MSA) extend the term of the program to 5 years. Under this extension, the program is scheduled to sunset after the 2011 season.

Following a typical schedule for this amendment package will require this discussion paper, followed by initial and final review of an analysis by the Council. After Council action, a regulatory package will be prepared for submission to the Secretary of Commerce, followed by the standard process for publication and comment on the proposed rule and issuance of the final rule. Under an expedited process, this action would be completed in time for any amendments to be in place for the fifth and final year of the program. In addition, commitment of staff time to an amendment analysis could limit staff availability for analysis of the any program extension.

Absent Congressional action, Council extension of the program will require the standard MSA regulatory process evaluating the program (or a modification of the program) and other alternatives (including the status quo, under which the fishery would return to management under the License Limitation Program). The action necessary to extend the life of the program is likely to be very time consuming for both staff and the Council.

The current rockfish management is a comprehensive management program that allocates annual harvest privileges of several species to cooperatives based on the historic participation of their members. Since these allocations are a Federal permit, issued as part of a limited access system, to harvest a quantity of fish expressed by units representing a portion of the total allowable catch of the fishery that may be held for exclusive use by a person, the allocations are defined limited access privileges under the MSA. In the reauthorization of the MSA, Congress revised both procedural and substantive requirements for adoption of limited access privilege programs. These requirements include the consideration of additional factors and program elements (such as the participation of fishing communities and regional fishery associations) and set asides for entry level or small vessel fishermen. In addition, privileges expire after a ten year period, but are renewed unless they are revoked, limited, or modified for failure to comply with either specific program requirements or violation of an MSA prohibition. Development of a program under these new provisions will likely exacerbate an already long time for regulatory implementation.

[1] Directed (or "primary") rockfish fisheries are prosecuted for Pacific ocean perch, northern rockfish, and pelagic shelf rockfish (which includes dusky rockfish, yellowtail rockfish, and widow rockfish) in the Central Gulf.

Additional program development by the Council and additional staff analysis arising from the revised MSA requirements are likely to be compounded by the need to revise aspects of the existing program. Specifically, aspects of the program intended to benefit processors may be beyond the general authority granted the Council under the MSA. In the catcher vessel sector, each qualified harvester is eligible for a single cooperative, which must associate with the processor to which it delivered the most pounds of rockfish during an identified period. Catcher vessels that choose not to join their associated cooperative fish may fish a limited access fishery without an exclusive allocation. No clear MSA authority authorizes a requirement that a harvester associate with a specific processor to access an exclusive harvest privilege. If the Council wishes to advance a program that fosters harvester/processor associations, that aspect of the program would need careful development in light of the authority of the MSA. Further consultation with NOAA General Counsel will be required, if the Council wishes to extend some fishery privileges (either harvester or processor) to processors in the fishery. In addition, other new management structures, such as regional fishery associations or fishing communities, could be used to extend benefits to processing interests.

An alternative approach to addressing rockfish program concerns identified by the Council is to incorporate program modifications into an analysis to extend the program. Although this could delay the implementation of the changes, this approach would ensure that the benefits of the changes would be realized for an extended period, rather than for the limited period until the sunset of the program. If the Council elects to include any program revisions in an action to extend the life of the program, it could undergo a broader scoping process to ensure that all desirable program changes (including changes to the protections of processor interests) are incorporated into that action. This approach could allow the Council to consider whether management provisions that are not permitted by the existing structure might better address issues in the fishery. For example, the current authority requires a 5 percent entry level set aside, but does not provide a means for entry level participants to transition into the larger program without purchasing a qualifying license. Under the general MSA authority (instead of the rockfish program authorization) it is possible that the Council could choose different means of allowing transition to the main program for entry level participants.

Discussion of possible program revisions

The remainder of this paper discusses the suggested revisions to the program included in the Council's June and October 2008 motions.

Allocations to persons who fished with interim licenses

The first proposed change to the program would create program eligibility for vessels that fished the Central Gulf rockfish fishery during the qualifying period with interim licenses that were later revoked, but who acquired a valid license to remain in the fishery. Specifically, the Council has proposed:

> A person who operated a vessel in the Central Gulf of Alaska rockfish fisheries during the 1996-2002 period under an interim License Limitation Program licence that was determined after such period to have an invalid Central Gulf of Alaska trawl gear endorsement, who then acquired an additional LLP license with a valid Central Gulf of Alaska trawl gear endorsement and assigned it to such vessel by December 31, 2003, shall be eligible to receive Rockfish Quota Share under the Rockfish Pilot Program based on the catch history of such vessel, notwithstanding the invalidity of the interim Central Gulf trawl LLP endorsement under which the vessel operated during the 1996-2002 period. Rockfish Quota Share allocated under this provision shall be assigned to the additional LLP license.

Background

The Council also requested staff to include a discussion of the removal of a similar provision from the alternatives considered when the pilot program was originally adopted and a discussion of any catcher vessel and catcher processor licenses that might be affected by this or a similar provision.

In the early development of the program alternatives, the Council included for consideration the following provision:

> Persons who have purchased an LLP, with a CGOA endorsement to remain in the fishery may obtain a distribution of harvest share history of either the vessel on which the LLP is based or on which the LLP is used, not both. License transfers for purpose of combining LLPs must have occurred by April 2, 2004.

As discussed by the Council when it was under consideration, this provision would allow a person who acquired a license for use on a vessel to obtain either the history of the vessel that the license is assigned to or the history of the vessel from which the license originated (but not both). In the event that the provision were adopted by the Council, the proposed amendment would be unnecessary (since it would be redundant).The provision was removed by the Council on the suggestion of the Advisory Panel at its February 2005 meeting, when the Council received a preliminary analysis of options. At the time, no public testimony was received in support of the provision. It is also believed that no one spoke in support of the provision prior to Council action defining the program. The absence of supports of the provision (or testimony from persons who might rely on the provision for an allocation) likely contributed to the Council's rejection of it.

Possible amendment to create eligibility for persons who fished with interim licenses

The Council requested discussion of the proposed amendment after receiving testimony that at least one vessel owner who participated in the fishery historically was denied an allocation under the program, despite having acquired an LLP license that would support continued participation in the rockfish fishery under the LLP.

To qualify for the rockfish pilot program a person needed to hold a valid LLP license endorsed for the Central Gulf that was used for at least one targeted rockfish landing during the qualifying years (i.e., a landing in which the sum of primary rockfish pounds exceeded pounds of all other groundfish combined). This provision would qualify a person whose vessel:

1) did not qualify for a Central Gulf endorsed LLP,
2) had at least one targeted landing of Central Gulf rockfish during the qualifying years, and
3) assigned a valid, permanent Central Gulf endorsed trawl license to the vessel prior to December 31, 2003 (which license is still assigned to the vessel).

Using these criteria, two catcher vessels and no catcher processors appear to qualify for the provision. This estimate is based on the number of vessels that have targeted rockfish catch in the qualifying period that did not receive a Central Gulf endorsed LLP, but have since assigned one to the vessel. One of these two vessels participated in all seven qualifying years; the other participated in only one of the qualifying years. Since only two vessels appear to qualify for the provision, no information concerning catch amounts of these vessels can be released.

In considering this action, the Council should consider the effects of the action on the allocations of both primary rockfish and other species allocated under the program. The allocation of primary rockfish to the program is made after first deducting an incidental catch allowance to support rockfish catch in other fisheries and an entry level set aside to support that fishery. The creation of eligibility for additional

licenses by this action would not affect those allocations. The portion of the rockfish TAC remaining after these deductions is divided between the two sectors that participate in the rockfish program (the catcher vessel sector and the catcher processor sector) and is then divided among cooperatives and the limited access fisheries. These sector, cooperative, and limited access allocations of the different primary rockfish species are all proportional allocations based on the respective quota share holdings of participants in the sectors, cooperatives, and limited access fisheries. Consequently, the qualification of additional licenses and history for the program would have the effect of redistributing a portion of the primary rockfish allocations under the program to the sector, cooperative, or limited access fishery of the newly qualified participants. So, the effect of new qualification on the primary rockfish allocations would be to dilute the allocations to current participants based on the proportion of newly qualified history.

In addition to primary rockfish species, program participants also receive allocations of secondary species (which may include Pacific cod, sablefish, shortraker rockfish, rougheye rockfish, and thornyhead rockfish)[2] and halibut PSC. Under the program, each sector can receive a maximum allocation of secondary species equal to the sector's retained incidental catch of the secondary species in rockfish target trips during the rockfish fishery in the qualifying years. The inclusion of additional qualified licenses in a sector would add qualifying history to that sector for retained incidental catch of secondary species by the license holder. If credited under the amendment, this additional history could be expected to slightly increase the allocation of secondary species to the sector. The increase in the allocation to the rockfish program would reduce the amount of the species available to other fisheries. Within each sector, each cooperative receives allocations of all allocated secondary species in proportion to its members' rockfish primary rockfish quota shares. So, if a cooperative's members have 20 percent of the primary rockfish quota shares, it will receive 20 percent of the maximum sector allocation of each secondary species.[3] The effects of the allocation to the newly eligible license on other participants in the sector depends on whether the new license's secondary species history relative to its rockfish history is greater or less than that of other sector members. A newly eligible license with a high catch rate of a secondary species relative to primary rockfish species could slightly increase the allocation of the secondary species to other sector members. In any case, the effect is likely to be minor as it will be dissipated across participants in the sector.

The effect of new eligibility on halibut PSC allocations is likely to be similar to the effect on secondary species allocations. Halibut PSC allocations to sectors, however, are calculated in a slightly different manner than secondary species allocations. Halibut PSC allocated to the program is based on total halibut usage in the rockfish fisheries during the qualifying years. This total PSC allocation is divided between the sectors in proportion to the primary rockfish history of the two sectors. As a consequence, a newly eligible license with substantial rockfish history, but little PSC could result in a slight increase in halibut PSC available to its sector (if the sector's halibut PSC allocation is adjusted under the amendment) and a slight decrease in the halibut PSC available to the other sector. A similar distributive effect would happen within the newly eligible license's sector, as the vessel would bring halibut PSC to its cooperative in proportion to its rockfish quota share.

Changes in management of the entry level fisheries

The Council has suggested three possible changes to management of the entry level fisheries. First, the Council has suggested a change from limited access management to some other form of management

[2] Currently the catcher processor sector catch of Pacific cod and the catcher vessel sectors catch of shortraker rockfish and rougheye rockfish are managed through maximum retainable amounts (MRAs), rather than direct allocations. In addition, all catches of secondary species in the limited access fisheries are managed through MRAs.
[3] If one or more sector members elect not to participate in a cooperative, the maximum amount will not be allocated. Withholding this allocation is intended to allow for harvests of the species by the limited access fishery under MRA management.

(such as cooperatives) for the entry level trawl fishery. Second, the Council has suggested either a direct allocation of halibut PSC to the entry level trawl fishery or the exemption of that fishery from halibut PSC limitations. Third, the Council has suggested revision of the rollover from the entry level fixed gear fishery to the entry level trawl fishery to allow more complete harvest of that allocation. Each of these proposals is examined after a brief description of the entry level fisheries.

Background

The ability to provide information concerning the entry level fishery is limited because few vessels and processors participated in those fisheries in the first year of the program. This discussion attempts to provide useful information to the extent that is permitted.

The entry level fishery is open to harvesters that are not eligible for the primary program. All deliveries from the entry level fisheries must be made to processors that are not eligible for the primary program. The entry level trawl fishery would be prosecuted as a competitive limited access fishery, open, on application, to any LLP license holders endorsed for the CGOA. The fixed gear fishery opens on January 1st each year. The trawl fishery is scheduled to open on the 1st of May, if halibut PSC is available. If PSC is unavailable at that time, the fishery would open upon the next release of halibut PSC. Since historic harvests suggested that the fixed gear sector may be unable to fully harvest its allocation, trawl participants are permitted to harvest the fixed gear allocation after September 1st. To maintain parity, the fixed gear sector is permitted to harvest any remaining portion of the trawl allocation after September 1st.

The trawl and fixed gear sectors receive equal allocations of the aggregated TACs of primary rockfish species available to the entry level fishery. Because of operational differences, the trawl sector receives its portion of the aggregate TACs first from the entry level TAC of Pacific ocean perch. If the Pacific ocean perch TAC is less than the total allocation to the trawl sector, the sector receives proportional shares of the northern rockfish and pelagic shelf rockfish TACs, such that entry level TAC is divide equally between the two gear types. The rationale for allocating Pacific ocean perch first to the entry level trawl sector is that the entry level fixed gear sector has no harvest history of the species and targeting of Pacific ocean perch with fixed gear is primarily experimental at this time.

Vessels fishing the fixed gear entry level allocation in Federal waters must have an LLP (if required for the vessel to operate in Federal waters) and must have registered for the entry level fishery. Fixed gear vessels that fish exclusively in parallel waters and do not have an LLP or a federal fisheries permit do not need to register for the program. In addition, these vessels that fish exclusively in parallel waters and do not have an LLP or federal fisheries permit may deliver their catch to any processor, including processors qualified for the main program (who cannot otherwise receive deliveries from the entry level fisheries). This relaxation of landing constraints allows greater flexibility for vessels that fish exclusively inside 3 nm by allowing them to deliver mixed loads of pelagic shelf rockfish and black rockfish to processors of their choice; however, it also allows processors participating in the main program to compete for entry level deliveries, which would otherwise be reserved for delivery to processors that do not qualify for the main program.

In the first and second years of the program, only a single vessel registered for the entry level fixed gear fishery. Since all harvests of primary rockfish by fixed gear vessels (inside or outside 3 nm) is counted against the entry level TAC, several vessels have reported harvests against the entry level TAC. Yet, these harvests have been relatively minimal in comparison to the available TAC (see Table 1). The fishery harvested less than one percent of either of its Pacific ocean perch or northern rockfish allocations. Less than 10 percent of the pelagic shelf rockfish allocation was harvested by the fishery.

Table 1 Entry level fixed gear TACs and catch (2007 and 2008).
fix tac and catch

		2007	2008*
Pacific ocean perch	TAC	17	54
	catch	0	0
	percent caught	0.00	0.00
Northern rockfish	TAC	169	115
	catch	1	1
	percent caught	0.59	0.87
Pelagic shelf rockfish	TAC	161	176
	catch	11	14
	percent caught	6.83	7.95

Source: NMFS gear reports
* Harvests through August 29, 2008.

In the first and second years of the program, the entry level trawl fishery received allocations of Pacific ocean perch only under the priority rule established for allocating species to the two entry level fisheries. Only two and four trawl vessels registered for the entry level trawl fishery in these two years, respectively. In the first year, both registered vessels participated in the fishery. The relatively small allocation to the fishery (approximately 350 tons of Pacific ocean perch) posed a management challenge, since vessels can harvest on the order of 100 metric tons in a day. Given the catching power of vessels in the fishery, it is difficult to time a closure to avoid overharvests. In the first year of the program, the two participating vessels managed to coordinate catches to avoid an overage in the fishery. On September 1st, entry level trawl participants were permitted to catch any unharvested portion of the entry level fixed gear allocations. Under this rule, managers opened both fisheries for northern rockfish and pelagic shelf rockfish for entry level trawl participants. The fishery for northern rockfish closed in November, but the fishery for pelagic shelf rockfish remained open through the end of the year. Participants have reported that the late opening conflicts with other fisheries, that rockfish are difficult to target during this period of the year, and that halibut PSC mortality in the third season Pacific cod fishery could limit the halibut PSC available to the entry level trawl rockfish fishery.

In the second year of the program, the opening of the entry level trawl fishery was delayed because the second seasonal trawl halibut PSC apportionment was fully used by the May 1st scheduled opening. When the fishery opened in July with the third season halibut PSC apportionment coming available, registered participants were in the process of negotiating an arrangement intended to allow the fishery to be prosecuted without exceeding the TAC. One participant began harvesting Pacific ocean perch on July 1st asserting and reporting those harvests were from Area 640, outside of the Central Gulf; however, NOAA Fisheries determined those harvests to be from the Central Gulf and to have fully harvested the available TAC to the entry level fishery. Consequently, the entry level trawl fishery was closed prior to any of the other vessels beginning to fish. As in the first year, managers opened all three directed trawl fisheries to allow entry level trawl participants to harvest the remaining entry level fixed gear TAC. These fisheries have remained open to date, as eligible vessels have chosen not to attempt to harvest these remaining TACs.

Possible change from limited access management of the entry level trawl fishery
The relatively small allocation to trawl participants is difficult to manage in a limited access, race-for-fish. A system that allows managers to more reliably ensure that the fishery can be opened without potential for the TAC to be exceeded might be preferable to the existing management.

Even with few vessels entering the fishery, managers have expressed concern that timing fishery closures to allow harvest of a substantial portion of the TAC without overages is extremely challenging. Although managers can use strategies such as short openings of less than 24 hours to limit catches, it is not possible to manage the TAC precisely. Participants have attempted to use gentlemen's agreements to limit harvests in these circumstances, but absent a management structure to compel these limits, the potential for these agreements to be reached and abided by is questionable. As a result, management of the small allocation to trawl vessels in the entry level fishery is likely to continue to be problematic under the current rules.

The management of the entry level fishery also poses problems related to the processing of catches. In the first year of the program, delivery scheduling posed challenges for trawl participants as a result of the race-for-fish management of the trawl fishery and the prohibition on deliveries to processors qualified for the main program. If prosecution of the rockfish fishery conflicts with other activity at entry level plants, deliveries under the program can create logistical complications for the plants and can lead to delays and loss of fishing time for harvesters and reduced product quality and value. Since the trawl entry level fishery can only support a few deliveries, no economies of scale are likely to be realized by processors gearing up for those deliveries.

The Council suggested that this discussion paper examine alternatives to the current limited access management of the entry level trawl fisheries that would control effort. The Council suggested use of cooperatives for this purpose, but also suggested that the paper could examine other possible management measures. Other suggested measures include individual allocations and the use of a lottery to limit the number of persons eligible to participate.[4]

Since an individual allocation is the simplest and most reduced form of exclusive allocation, that possible measure is discussed first. Under a system of individual allocations, the entry level trawl TAC could be equally divided among the applicants for the fishery. Allocations could be fished at any time (if adequate halibut mortality is available to support the fishing). Each holder of an individual allocation would be constrained by the allocation the person received and would be liable for any overage. These constraining allocations and accompanying liability for overages would effectively address the TAC management (or effort control) issues in the fishery. To date, only four trawl vessels have applied for the program. Under the recent allocation levels, with only four participating vessels, each vessel will receive slightly more than 80 metric tons of Pacific ocean perch. Although not overly generous, this allocation is likely adequate to support participation. If additional persons apply for the fishery, it is possible that allocations could be too small to support participation.

Depending on the Council's preference, individual allocations could be transferable. Transferability could aid participants in achieving efficiencies (allowing the most efficient vessels to harvest the allocations) and could be used to aggregate small residual amounts of the TAC to allow the TAC to be more fully harvested. Unlimited transferability, however, could have some undesirable consequences. If an entire allocation can be transferred, some absentee ownership may occur, as applicants may elect to transfer their entire allocations, rather than fish. At the extreme, allowing unlimited transferability of individual allocations could induce persons who have no intention of fishing to apply for the entry level fishery, expecting to lease their allocation to another participant. So, if the Council intends to use a system of

[4] In developing alternative management structures for the limited access fishery, the Council should be cognizant of the authority under which the program would be developed. Exclusive allocations to either individuals or cooperatives are both defined as limited access privileges by the MSA as reauthorized. It could be argued that the establishment of new limited access privileges in the entry level fishery should follow the requirements of the MSA as reauthorized. Countering this argument is that the rockfish program (including the entry level fishery) was established under separate authority prior to the reauthorization of the MSA, which expires after 5 years.

individual allocations, it could consider some limitations on transfers to ensure the participants in the entry level fishery actually enter the fishery (not just the market for shares). Limiting the percentage of a person's allocation that may be transferred may effectively address this problem.

An alternative to individual allocations in the entry level fishery could be a cooperative structure. Cooperatives can provide benefits to participants, as they provide a structure for coordination of harvest activity. In addition, cooperatives can reduce management burdens, as harvest activity is monitored at the cooperative level, instead of at the individual or vessel level.

In the past, the Council has used a variety of harvest cooperative structures to ensure that the cooperative achieve their intended purposes. In some instances (including in the management of the rockfish program generally), the Council included a requirement that cooperatives association with specific processors to preserve historic processor/harvester associations and to ensure processors share in the benefits of the program. Any cooperative structure that has a processor component would require some assessment of the Council's authority for the structure. Whether a processor component is authorized is not known and may depend on whether the Council chooses to adopt modifications under its original authority for establishing the rockfish program or the MSA as reauthorized. If the Council elects to include a processor component in its program that provision will require careful assessment of its authority.

The Council has typically included a variety of provisions in its cooperative programs (such as minimum membership thresholds and provisions defining the scope of liability of members for cooperative harvest activity) to ensure that the programs function as intended. Membership thresholds have been applied to ensure that participants form cooperative associations of size adequate to achieve the desired level of coordination. The use of minimum membership thresholds for cooperative formation when combined with a requirement of cooperative membership to receive an exclusive allocation can raise equity concerns, since participants could use membership thresholds to apply undue negotiating pressure on others. Once a threshold is met, cooperative members may be able to demand favorable terms from others in the entry level if cooperative membership is required to participate in the fishery. For example, if only three persons apply for the entry level fishery, even a membership threshold of two, could allow two of the applicants to impose onerous membership terms on the third applicant. With few persons showing an interest in the entry level fishery to date, a requirement of cooperative membership to receive an exclusive allocation could have unpredictable distributional consequences.

If the Council elects to include a cooperative structure in its management of the entry level fishery, it should also consider the level of participation that will be required of any participant in the fishery. If three persons apply for the entry level fishery and form a cooperative, one participant could harvest the entire allocation in the fishery. If the objective of the entry level set aside is to allow entry to the fishery, it is possible that that objective will not be met under a cooperative structure that does not include participation requirements. In a system of individual allocations, transfers can be prohibited to prevent non-participating applicants to the entry level fishery from deriving benefits from an exclusive allocation. Under a cooperative structure, defining requirements to achieve participation goals may be more difficult. Since allocations are managed at the cooperative level, it is not possible to use a limit on transfers to achieve participation objectives.

Revising management to a system of individual allocations or cooperatives would require reconsideration of observer coverage in the entry level fishery. Currently, entry level trawl vessels are only required to carry an observer, if they fish 3 or more days. Vessels that are required to have an observer on board must have at least 30 percent of fishing trips in the directed fishery in each quarter or at least one fishing trip. In the main program, under which cooperatives receive exclusive allocations, catcher vessels are required to maintain 100 percent observer coverage. Modification of observer coverage levels will need to be considered, if the fishery is modified to one of exclusive allocations.

It has also been suggested that a lottery system could be used to limit entry or allocate shares in the entry level fishery. If the Council elects to continue management through a limited entry system, the use of a lottery might be promoted to avoid catch management challenges arising because the effort in the fishery cannot be effectively managed. Yet, given the performance of the entry level trawl fishery in the first two years of the program, it is unlikely that simply limiting the number of vessels in the fishery will address that management issue.

It is unclear whether a lottery system could be efficiently administered by NOAA Fisheries or whether a lottery would be deemed suitable. A lottery for allocating privileges might be challenged for fairness or causing instability. In addition, participants in the lottery would need to have the opportunity to appeal lottery outcomes. Appeals could cause delays in fishing or lead to program ineffectiveness. In any case, a lottery system will require substantial development of administrative aspects.

The suggested revisions to the entry level trawl fishery could involve several layers of decisions for the Council. These include:

A. limited entry management
    a. whether to include a lottery to allocate privileges or limit entry
    b. other means to control effort
B. cooperative management
    a. basis for allocations
        i. equal allocations to all license holders
        ii. possible discount for non-members of cooperatives
    b. cooperative formation requirements
    c. opportunities for persons unable to reach cooperative agreements
        i. individual allocations
        ii. limited entry
        iii. other opportunity
    d. required level of participation for cooperative membership
    e. transferability of allocations among cooperatives or individuals (if individual allocations for non-members of cooperatives)
C. individual allocations
    a. basis for allocations
        i. equal allocations to all license holders
        ii. other allocation rule
    b. required level of participation
    c. transferability of allocations

It should be noted that the complexity and depth of program modifications required for this change may be comparable to the development of a share-based management system. At the extreme, it is possible that program development, analysis, and implementation could be a protracted process that extends beyond the sunset of the pilot program authority. The extended process required for a change of this type bolsters any argument that program changes might be better handled in a more comprehensive way that addresses the sunset of the main program after 5 years of fishing.

If the Council elects to consider development of alternatives to extend the program indefinitely, the Council can address entry in a more focused manner that considers current participation levels and capitalization in the fishery and the potential for vessels and processors to enter the main program, which is currently accessible to vessels only through the acquisition of a license qualified for the main program or to a processor through the acquisition of a plant qualified for the main program.

Changing the availability of the entry level fixed gear allocation to trawl vessels to ensure more fully harvest of the TAC

Currently, any remaining portion of the entry level fixed gear allocation comes available to entry level trawl sector participants on September 1st. In the first two years of the program, the fixed gear participants harvested very little of rockfish available to them under the program. In addition, trawl participants have suggested that the September 1st opening of the fixed gear allocation for harvest by trawl vessels provides little opportunity for the harvest of the remaining allocation because of conflicts with other fisheries. In addition, availability of halibut PSC from the deepwater complex may prevent harvests until after the fourth season halibut apportionment comes available on October 1st. These factors collectively have resulted in little harvest of the portion of the rockfish TAC allocated to the fixed gear entry level fishery in the first two years of the program. To begin the process of addressing this issue, the Council has suggested that staff discuss possible revisions to the entry level fixed gear allocation and its availability to the trawl sector in this paper.

In considering possible revisions to the allocation and management of the fixed gear entry level fishery allocation, the Council should be careful to note interactions of their decisions with other decisions concerning the entry level trawl fishery management. Specifically, if the Council elects to shift to a system of exclusive allocations in the entry level trawl fishery, the current management, under which the trawl sector is generally permitted to harvest the fixed gear allocation after a specific date, may not be effective. A cleaner approach might be to reduce the allocation to the sector to a size that more closely matches the catch of the sector. In the event that the Council chooses to modify the size of the allocation, it could include provision for an increase in the allocation in the event that the sector fully (or near fully) harvested its previous year's allocation. Such a provision would allow the sector the opportunity to grow, if participation or the effectiveness of participants increases. Modifying the fixed gear allocation would allow for more effective harvest of trawl allocations, since NOAA Fisheries could make exclusive allocations to trawl sector participants prior to the season opening.

Even if the current system of limited entry management is maintained in the trawl sector, modifying the date on which trawl participants are permitted to harvest the entry level fixed gear allocation could impose greater hardship on the fixed gear sector than simply changing the allocation. Fixed gear harvests of rockfish are likely to be infringed on more as the date that the harvest of the fixed gear allocation is opened to trawl vessels is moved up. It is likely that trawl vessels could effectively harvest the entire fixed gear allocation in the mid summer (when the rockfish fishery has been historically prosecuted). If permitted, these trawl harvests could result in a closure of the fishery to both gear types shortly after the opening to trawl gear. A reduced allocation that does not become available to the trawl sector may more effectively protect fixed gear interests in the rockfish fishery. Some portion of the TAC may be stranded using this approach, but the amount stranded might be limited.

Change in halibut usage by the entry level trawl fishery

The entry level trawl fishery is dependent on halibut mortality that is generally available to trawl vessels participating in Gulf of Alaska deepwater complex fisheries. If halibut mortality is unavailable when the rockfish entry level trawl fishery opens (or when participants elect to fish), the prosecution of the fishery may be delayed. These delays can disrupt participation in other fisheries by entry level trawl vessels and processor, as well as cause delivery timing problems, if the timing of the next halibut available coincides with fishing or processing activities in other fisheries. These disruptions led the Council to suggest that this paper include a discussion of possible options for the management of halibut in the entry level trawl fishery. Two options were suggested – an allocation of halibut mortality to the entry level trawl fishery and the exemption of the entry level trawl fishery from halibut mortality limits.

In considering whether an allocation of halibut might be appropriate for the entry level rockfish fishery, the Council should consider both the ability of NOAA Fisheries to manage the allocation and the potential for the management of that fishery to affect halibut usage and the adequacy of the allocation. Allocating halibut to a small limited access fishery could exacerbate the existing problem of managing the fishery to avoid overages. A halibut allocation might simply extend the management problem that currently exists for rockfish allocations to the halibut PSC allocation. In addition, in a limited access fishery without individual constraints on rockfish or halibut catch, it is possible that the incentive to obtain a greater share of the available rockfish could lead participants to disregard relatively high halibut bycatch rates. Unless the allocation is excessive, it is possible that full harvest of the TAC could be threatened by a halibut PSC closure.

If the Council elects to change management of the entry level trawl fishery to a share-based system (i.e., cooperatives or individual allocations), exclusive halibut PSC allocations could be made to each person receiving an annual allocation. Since each person would receive an annual allocation of rockfish and PSC, an incentive to conserve halibut PSC would exist, to the extent that the allocation could be constraining. The Council would need to consider the extent of potential halibut mortality to determine the allocation to participants in the entry level trawl fishery. The best source for assessing possible halibut mortality needs in the fishery is likely the historic halibut catch in the rockfish fishery.

Under limited access management prior to implementation of the pilot program halibut mortality in the rockfish fishery was relatively high. From 2003 to 2006, inclusive, halibut mortality per ton of primary rockfish catch ranged from 22 pounds to 36 pounds for the catcher processor sector. During the same time period, halibut mortality per ton of primary rockfish in the catcher vessel sector ranged from 26 pounds to 56 pounds. In the first year of the program, halibut mortality per ton of primary rockfish was 4.2 pounds for catcher vessel cooperatives, 8.6 pound for the catcher processor cooperative, and 12.8 pounds for the catcher processor limited access. At bycatch rates equivalent to the pre-pilot program extremes approximately 3.5 metric tons to 9 metric tons of halibut would be needed to support harvest of the 350 metric ton allocation of rockfish to the entry level trawl fishery in the first year of the program. At the lower bycatch rates observed in the first year of the program, the entry level trawl fishery would have required between two-thirds of one ton and two tons of halibut PSC to harvest its 350 ton rockfish allocation. While these average bycatch rates can be used to suggest halibut PSC allocations that may be able to support an entry level trawl fishery, cooperative and individual levels of usage should be considered, as that would be the basis of any allocations.

Based on cooperative reports, no cooperative approached full usage of its halibut allocation, with the cooperative that used the most of its halibut taking only approximately one-third of its allocation. Yet, each cooperative received approximately 37 pounds of halibut mortality for each ton of primary rockfish. Despite the overall success of cooperatives in maintaining low levels of halibut mortality, some vessels are reported to have exceeded precautionary bycatch rates set by their cooperatives to ensure adequate halibut mortality is available for the cooperative to fully harvest its rockfish and secondary species allocations. At the extreme, some vessels had halibut mortality rates similar to rates observed prior to implementation of the program.

As with all bycatch allocations, any halibut PSC allocation for the entry level trawl fishery should be set to allow full harvest of the target species allocations while creating an incentive for reduced mortality. An overly high halibut PSC allocation might create no deterrent; an overly low allocation might prevent harvest of the rockfish allocation. A difficulty that arises in the entry level trawl fishery is few vessels participate. With only a few vessels, the entry level trawl fleet has a small base across which to distribute extraordinary high halibut bycatch trips or hauls. Most vessels in the main program received allocations of primary rockfish species greater than the entire allocation to the entry level trawl fishery. Those vessels also have the ability to form cooperatives to collectively manage halibut allocations and catches. In

addition, the main program participants can engage in post-delivery transfers of allocations to cover unanticipated overages. Under the current program structure that isolates the allocation to the entry level trawl fishery, it is possible that one or more of those vessels may be unable to complete its harvests of rockfish, if the vessel has an unavoidable and unexpectedly high catch of halibut.

In the main program, unused halibut PSC is available for use in the fall deepwater complex fisheries. By making the catch available for later use, cooperatives have an incentive to conserve halibut PSC that might otherwise be dissipated. A similar approach could be used to create an incentive for halibut preservation under an entry level trawl halibut PSC allocation. Since the entry level fishery has only a few participants (and would likely receive a relatively small halibut PSC allocation), it is uncertain whether the incentive would be effective. The incentive in the main program is driven by an intercooperative agreement among all catcher vessel cooperatives, which includes penalties for exceeding specific bycatch levels. Whether similar agreements would be used in the entry level is uncertain.

An alternative to providing the entry level trawl fishery with a halibut allocation is to simply exempt the fishery from any halibut limit. Using this approach, the fishery would not be constrained by halibut, but halibut mortality would be counted against the trawl deepwater halibut limit in the Gulf. Mortality would be counted against the season in which the halibut is used (or in next subsequent season, if the current season's apportionment is fully used). Such an approach would provide entry level participants with the opportunity to harvest rockfish during the scheduled season despite halibut limitations that have applied to other fisheries.

If the limited access structure of the entry level trawl fishery is maintained, it is possible that the exemption of halibut from any limitation could lead participants racing for rockfish to show little regard halibut mortality. The mortality would affect limited access fisheries either in the current or subsequent season, but would not affect the prosecution of the entry level trawl fishery. Participants in the entry level, however, may be reluctant to exert efforts to avoid halibut mortality, if they believe that it will reduce catches of rockfish in the race for fish. For example, a vessel may be unwilling to move from an area of high halibut catch, if that move requires additional fuel usage and reduces the amount of time that the vessel can spend catching rockfish.

If the entry level fishery is managed through individual or cooperative allocations of primary rockfish, the exemption of the fishery from halibut limits may be more likely to avoid halibut catch, but the absence of a limit would still reduce the incentive for avoiding halibut. The vessel may be reluctant to incur additional fuel costs to avoid halibut, but its catch of rockfish should not be jeopardized by the move. Since the entry level trawl fishery receives a relatively small allocation of primary rockfish, the extent of any threat of excessive halibut is limited. At the highest preprogram halibut bycatch rate, the total catch of halibut by the entry level fishery would be slightly less than 9 metric tons, based on the current rockfish allocation. Although the extent of any mortality might be limited by the small allocation, the reduced incentive for avoiding halibut mortality under this approach should be considered.

Change in management of shortraker rockfish and rougheye rockfish for the catcher processor sector

Members of the catcher processor sector have suggested that the current allocations of shortraker rockfish and rougheye rockfish are overly constraining. Sector members believe that the current allocations prevent participants from realizing historic catches from the fishery. In addition, some sector members have suggested that the relatively small allocations create a disincentive for cooperative membership.

Background

Under the program, the catcher processor sector receives an annual allocation of shortraker rockfish equal to 30.03 percent of that TAC and rougheye rockfish equal to 58.87 percent of that TAC. This allocation is divided among cooperatives with each receiving a share equal to its members' share of the total primary rockfish QS. If any eligible catcher processor sector members choose not to join a cooperative (either opting out of the program for the year or electing to fish the limited access fishery), a share of the allocations that would have gone to cooperatives with their membership is not made. Sector members that choose to fish in the limited access fishery do not receive an allocation. Instead, limited access participants are limited by a maximum retainable amount of combined shortraker rockfish and rougheye rockfish equal to two percent of catch of primary rockfish. This maximum retainable amount applies at all times and its calculation renews on each weekending date.[5]

During program development, the Council considered a variety of options for the allocation of shortraker rockfish and rougheye rockfish. At that time, a change was underway from management under an aggregate TAC to management under separate TACs for the two species. Stock estimates of rougheye rockfish exceeded stock estimates of shortraker rockfish, but that shortraker rockfish was a greater share of the catch under the aggregate TAC. To address any potential overexploitation of shortraker rockfish, the Council elected to establish separate TACs for the two species.

In developing the rockfish pilot program, the Council first considered allocation of shortraker rockfish and rougheye rockfish based solely on aggregate catches of the two species during the qualifying period. Each sector would then receive two allocations by applying its share of the historic aggregate catch the two species to each of the two species TACs. Data were (and are) unavailable to establish the share of each species caught from the aggregate catches during the qualifying period. Under this approach, the catcher processor sector would receive approximately 60 percent of the shortraker rockfish TAC and 60 percent of the rougheye rockfish TAC, while the catcher vessel sector would receive approximately 6 percent of each TAC. The Council also considered an option to credit only 75 percent of the catch history of the catcher processor sector in determining its allocation, effectively reducing the allocation to approximately 45 percent of the combined TACs. In considering this allocation, the Council expressed concern that relatively high share of the historic catch of these species could threaten the stocks, if other fisheries increased their catches under the limited access MRA management that governs those fisheries.[6]

Adopting a precautionary approach to limiting catches of the species, the Council allocated to the catcher processor sector approximately 30 percent of the shortraker rockfish TAC (approximately one-half of its historic percentage of the aggregate shortraker rockfish/rougheye rockfish TAC harvest in the qualifying years) and approximately 60 percent of the rougheye rockfish TAC to the catcher processor sector (approximately its historic percentage of the aggregate shortraker rockfish/rougheye rockfish TAC harvest). In the limited entry fishery, catcher processors are subject to a reduced aggregate shortraker rockfish/rougheye rockfish MRA of 2 percent (a percent substantially lower than the 7 percent MRA applied prior to the program). The reduced MRA is intended to protect these species and create an incentive for cooperative membership.

In the first year of the program, two catcher processor cooperatives formed. One of these cooperatives fished; the other transferred most of its allocations to catcher vessel cooperatives and a portion of its shortraker rockfish and rougheye rockfish allocation to the other catcher processor cooperative. One

[5] Catcher vessels participating in the program (in the limited access or cooperatives) are subject to a 2 percent MRA on shortraker rockfish and rougheye rockfish. In addition, catcher vessels are prohibited from retaining shortraker rockfish, if the sector's harvest of the species exceeds 9.72 percent of its TAC.

[6] In most fisheries (other than the primary rockfish fisheries) the MRA of aggregate shortraker rockfish/rougheye rockfish is 7 percent.

vessel fished in the active catcher processor cooperative and three vessels fished in the catcher processor limited access fishery. Catches were below allocations after transfers for all species (see Table 2).

Table 2. Total catch and allocations of allocated species by catcher processors in the Gulf rockfish pilot program (2007).

cp - alloc and catch

	Species	Number of vessels	Catch (in metric tons)	Allocation excluding transfers (in metric tons)	Percentage of allocation harvested
Cooperative*	Pacific Ocean Perch	1	1,667	1,700	98
	Northern Rockfish	1	153	284	54
	Pelagic Shelf Rockfish	1	113	141	80
	Sablefish	1	78	87	90
	Shortraker Rockfish	1	43	34	126***
	Rougheye Rockfish	1	11	117	10
	Thornyhead Rockfish	1	23	74	31
Limited Access	Pacific Ocean Perch	3	943	1,008	94
	Northern Rockfish	3	584	675	87
	Pelagic Shelf Rockfish	3	535	1,065	50

Source: Catch Accounting Data and Cooperative Reports.

Note: Excludes allocation of catcher processor cooperative that did not fish.

*Data are not confidential because of disclosure in cooperative reports.

** Withheld for confidentiality.

*** No overage occurred because of transfer of cooperative quota.

Generally, catcher processors are permitted to retain more shortraker rockfish and rougheye rockfish, if they join cooperatives (see Table 3). So, maximum retained catch by the sector would be permitted, if all catcher processors chose to join cooperatives. Yet, since discards are permitted by participants in the limited access, it is possible that total catches of shortraker rockfish and rougheye rockfish could be greater if all catcher processors chose to join the limited access than fish in cooperatives, if participants in the limited access have substantial discards. In addition, since the MRA applies to aggregate catches of shortraker rockfish and rougheye rockfish, it is possible that catches of shortraker rockfish (the species of greater biological concern) could be greater in the limited access fishery. Catches in the first year of the program were substantially below the total amount permitted.

Table 3. Maximum permitted catches and actual catch of shortraker and rougheye rockfish in the first year of the pilot program.

shrtrkrrgheye

		Catcher processor	Catcher vessels	Total
Maximum permitted catches under various co-op membership scenarios	Maximum sector shortraker allocation	106*	NA	
	Maximum sector rougheye allocation	360*	NA	
	Maximum sector catch of MRA shortraker and rougheye - aggregate	192**	204	
	Maximum retained catch of shortraker and rougheye			669
Maximum permitted catches under first year co-op memberships	Allocation of shortraker to cooperatives	60		
	Allocation of rougheye to cooperatives	203		
	Maximum MRA catch of shortraker and rougheye - aggregate	41	204	
	Maximum retained catch of shortraker and rougheye			508
Catches in the first year	Total catch of shortraker by cooperatives	44	9	
	Total catch of rougheye by cooperatives	11	10	
	Total catch of shortraker and rougheye by limited access	32		
	Total catch of shortraker and rougheye			106

Source: NMFS Catch Accounting data

Notes: MRA amounts assume that allocations of primary species are harvested in their entirety. MRAs limit only retained catch, so maximum catch under an MRA excludes potential discards. Total catch amounts include discards and retained catch.

* Maximum allocation to cooperatives, if all catcher processors join a cooperative.

** Maximum possible MRA catch, if all catcher processors join the limited access fishery.

In the first year of the program, catcher processors participated in both cooperatives and the limited access fishery. The choice of some catcher processors to participate in the limited access fishery reduced the permitted retained catch of the two species by over 150 metric tons. Yet, some catcher processors are reported to have been reluctant to join cooperatives because of the potential that the constraining shortraker rockfish and rougheye rockfish allocations would limit their ability to harvest primary species. Notwithstanding this fear, during the first year of the program, total catch of shortraker and rougheye in the limited access were approximately 10 metric tons less than the amount that could be retained under the MRA and were substantially less than would have been permitted had these catcher processors elected to participate in cooperatives. Catcher vessels in the program harvested less than 10 percent of the maximum amount permitted by its MRA.

Catches of both species under the program's system of allocations and MRAs were less than historical catches in the rockfish fishery since the qualifying period (see Table 4).[7] In addition, catcher processor catches in the first year of the program were substantially lower than the 60 percent historical share of the aggregate species TAC harvested by the sector during the qualifying period.

Table 4. Total allowable catches and total catches of shortraker rockfish and rougheye rockfish in the Central Gulf rockfish fisheries (2005-2007).

rfish shrreye

Year	Species	Total allowable catch	Catcher processor sector		Catcher vessel sector		Total	
			Catch (in metric tons)	Percent of the total allowable catch	Catch (in metric tons)	Percent of the total allowable catch	Catch (in metric tons)	Percent of the total allowable catch
2005	Shortraker rockfish	324	127	39	19	6	146	45
	Rougheye rockfish	557	48	9	9	2	57	10
2006	Shortraker rockfish	353	145	41	14	4	159	45
	Rougheye rockfish	608	5	1	30	5	35	6
2007	Shortraker rockfish	353	63	18	4	1	67	19
	Rougheye rockfish	611	19	3	6	1	25	4

Source: NMFS Catch Accounting.

Also, total catches of shortraker rockfish and rougheye rockfish in all fisheries relative to their TACs do not suggest any danger of overharvest of the current TACs (see Table 5).

Table 5. Catches and total allowable catches of shortraker rockfish and rougheye rockfish in <u>all</u> Central Gulf fisheries (2005 -2007).

allfish

Year	Shortraker rockfish			Rougheye rockfish		
	Catch (in metric tons)	Total allowable catch (in metric tons)	Percent of total allowable catch harvested	Catch (in metric tons)	Total allowable catch (in metric tons)	Percent of total allowable catch harvested
2005	223	324	68.8	122	557	21.9
2006	303	353	85.8	134	608	22.0
2007	158	353	44.8	178	611	29.1

Source: NMFS Catch reports (2005-2007).
Note: Prior to 2005, shortraker rockfish and rougheye rockfish were managed using an aggregate total allowable catch.

[7] Reliable estimates of the catch of the different species are not available prior to 2005.

Change to MRA management of shortraker rockfish and rougheye rockfish for the catcher processor sector

To address the shortfall of shortraker rockfish or rougheye rockfish faced by catchter processor cooperatives under the allocations of these species, it is suggested that the MRA management be adopted. Under MRA management, catcher processors exceeding the MRA at any point in a trip would be required to discard catches above the MRA.[8] While MRA management would create greater flexibility for vessels unable to limit their catches of shortraker rockfish and rougheye rockfish, it may have some undesirable effects.

MRAs can contribute to discards. As currently applied in the Gulf, an MRA requires discards of catch that exceed the prescribed level at any time. So, a vessel that catches an unexpected amount of an MRA species early in a trip may be forced to discard, even if the catch would be retainable at a later time in the trip. For valuable species, an MRA may induce a vessel to catch up to the maximum amount, knowing that overharvest of the MRA may be discarded without risk of penalty. These added discards are avoided under the current allocations, which counts all harvests against the allocation.

MRAs can also contribute to excessive harvests of a species. Since an MRA limits only retention, requiring vessels to discard above the retainable amount, they do not limit total harvest of a species. To effectively limit total catch requires a limit on catch in addition to an MRA. Typically, species subject to an MRA are also subject to limits on catch by all vessels, above which no retention is permitted. Without this additional limitation, overall catch will not be limited by regulation. For species of value that are fully utilized, establishing an MRA in a fishery prosecuted with exclusive allocations and an extended season could provide participants in the fishery with an advantage in the harvest of the MRA species. Persons able to harvest the MRA in conjunction with exclusive allocations may be under less time pressure to harvest the MRA species than persons fishing in a limited access race for fish.

If the Council elects to proceed with an action to manage catcher processor catch of shortraker rockfish and rougheye rockfish with an MRA, it could consider whether total catch of the species by catcher processors participating in the program should be limited, as is done for the catcher vessel sector. Catcher vessels are subject to a 2 percent MRA for shortraker rockfish and rougheye rockfish combined, and are not permitted to retain shortraker rockfish, if the sector's harvests exceed 9.72 percent of the TAC. Establishing such a limit for the catcher processor sector would prevent excessive catches by the sector.

Two possible motivations for modifying management of the shortraker rockfish and rougheye rockfish for the catcher processor sector have been suggested. First, it is suggested that the current binding allocations of these species may constrain harvest of target rockfish allocations. Catch processors have suggested that relatively high catch rates of shortraker rockfish in the grounds they typically fish put them in jeopardy of fully harvesting their allocations of shortraker rockfish prior to fully harvesting their primary rockfish allocations. In 2006 under limited access management, catcher processors in the rockfish fishery caught approximately 41 percent of the shortraker TAC, substantially greater then the 30 percent allocation they receive under the rockfish pilot program. Despite this catch, approximately 15 percent of the TAC was left unharvested in that year. In the first year of the program, catcher processors harvested approximately 18 percent of the shortraker TAC, while approximately 45 percent was left unharvested. In the first year, the only active cooperative exceeded its initial allocation by 25 percent, avoiding an overage by acquiring a transfer of quota from another cooperative. Modifying management of shortraker rockfish and rougheye rockfish by establishing an MRA for these species would minimize the potential for harvests of shortraker rockfish to prevent harvest of primary rockfish. Yet, an increase in the allocation of shortraker rockfish to

[8] The Council's direction in analyzing this did not suggest a change in the MRA level, but it is believed that a change would be appropriate if the intent is to permit additional catches by the catcher processor sector.

the sector could accomplish the same end, without increasing the incentive or potential for discards (or excessive harvests).

A second motivation for establishing MRA for management of shortraker rockfish and rougheye rockfish for catcher processors is that it would allow the sector to take an amount closer to its historic harvests. The average estimated harvest of shortraker rockfish during qualifying years was approximately 195 metric tons. In the first two years of the program, the maximum allowable harvest of shortraker rockfish by the sector under the program was approximately 100 metric tons (assuming all vessels joined a cooperative). A few factors led the Council to make this relatively small allocation. The sector took approximately 60 percent of the combined TAC of shortraker rockfish and rougheye rockfish in the qualifying years. Estimates suggest that shortraker rockfish made up a larger share of this harvest than rougheye rockfish. Yet, to protect the shortraker rockfish stock, the Council limited the allocation to the sector to approximately 30 percent of the shortraker rockfish TAC. Under the divided TAC of the two species, the shortraker rockfish TAC makes up approximately one-third of the combined TACs of the two species. This TAC change, together with the reduced allocation of shortraker rockfish to protect the stock, led to a substantial reduction in the permitted harvests of that species by catcher processors participating in rockfish cooperatives.

If the Council's concern is that the current allocation overly constrains the catcher processor sector from maintaining historic harvests, it could address this shortcoming by increasing the allocation to the sector. This would allow the sector to increase its catch to an amount closer to its historic catch level, but without creating an incentive for discards or overharvest, which might arise under MRA management. In addition, an allocation will allow the Council to more precisely allocate catch of shortraker rockfish and rougheye rockfish to the sector without less potential to unintentionally disadvantage participants in other fisheries.

Change in the basis species for determining MRAs

Under the current structure of the rockfish pilot program, only primary rockfish species are counted as basis species for determining maximum retainable amount of species that are not allocated. The Council has asked staff to discuss the potential for adding catches of species other than primary rockfish to the basis species for determining MRAs under the program.

Background

Under the program, cooperatives receive exclusive allocations of the three primary rockfish species and as many as four secondary species. These secondary allocations may be harvested at the discretion of the cooperative, including as separate targeted trips. In the first year of the program, catcher vessel cooperatives made trips targeting two secondary species Pacific cod and sablefish (see

Table 6). During these trips, little primary rockfish were harvested. By limiting their catch of rockfish in these trips, harvesters are able to both reduce costs of traveling to the different grounds and increase quality of catch by limiting the extent of mixing of Pacific cod and sablefish with rockfish, the spines of which can damage more fragile fish.

Table 6. Rockfish pilot program catcher vessel trips and catch targeting species other than rockfish (2007).

cv targeting

Target	Vessels with at least one trip in the target	Total trips in the target	Species caught in the target	Catch (in metric tons)	Percent of total catch of the species
Pacific cod	10	11	Pacific Ocean Perch	5.2	0.1
			Northern Rockfish	0.9	0.0
			Pelagic Shelf Rockfish	0.4	0.0
			Pacific Cod	**207.1**	**74.7**
			Sablefish	30.5	6.6
Sablefish	14	16	Pacific Ocean Perch	16.1	0.4
			Northern Rockfish	0.0	0.0
			Pelagic Shelf Rockfish	0.9	0.1
			Pacific Cod	15.7	5.7
			Sablefish	**229.1**	**49.2**

Source: NMFS Catch Accounting Data.

During trips that do not target rockfish, MRAs for species that are not allocated are determined based on catch of primary rockfish only. So, vessels with little harvest of primary rockfish are very limited in their retention of unallocated species (including shortraker rockfish and rougheye rockfish). While some discards in the fishery have been voluntary, others are likely required by MRA limits. This influence is suggested by the sum of the differences in percent of catches discarded in rockfish targeted trips compared to discards in trips targeting other species. Arrowtooth flounder discards, which are relatively large percentages and large amounts of catch when compared to other species, are an exception. These high discards are likely a result of the relatively high biomass and low value of the species. Differences are most pronounced for flatfish species and rougheye rockfish. Although in most cases, the discards are relatively small amounts of fish, requiring discards contributes to waste and imposes an unnecessary sorting burden on crews.

Table 7. Preliminary catcher vessel species catch (in metric tons) by target in the rockfish pilot program (2007).
cvctchdiscbytrgt

Species	Target	Discarded	Retained	Total	Percent discarded
Atka mackerel	Rockfish	0.1	0.6	0.7	8.2
Arrowtooth flounder	Rockfish	132.0	46.1	178.1	74.1
	Other	196.9	17.7	214.7	91.7
Big skate	Rockfish	*	*	0.2	*
	Other	2.6	0.0	2.6	100.0
Deepwater flatfish	Rockfish	4.5	12.8	17.3	26.0
	Other	15.9	4.6	20.5	77.6
Flathead sole	Rockfish	0.9	5.9	6.8	12.8
	Other	2.8	2.4	5.1	53.7
Longnose skate	Rockfish	1.0	1.1	2.1	46.6
	Other	*	*	6.5	*
Other species	Rockfish	6.7	1.7	8.5	79.4
	Other	2.5	0.1	2.6	96.0
Pollock	Rockfish	1.5	19.9	21.4	6.9
	Other	2.7	0.5	3.3	83.3
Rex sole	Rockfish	1.3	6.0	7.3	17.8
	Other	7.9	1.5	9.4	84.0
Rougheye rockfish	Rockfish	0.3	4.8	5.1	5.0
	Other	3.7	1.1	4.8	77.5
Other rockfish	Rockfish	2.2	37.2	39.4	5.5
	Other	*	*	0.7	*
Shallow water flatfish	Rockfish	0.2	2.1	2.3	10.6
	Other	3.4	2.0	5.3	63.0
Shortraker rockfish	Rockfish	*	*	4.4	*
	Other	*	*	4.9	*
Thornyhead rockfish	Rockfish	1.4	19.6	21.0	6.7
	Other	2.2	26.6	28.8	7.6
Other skate	Rockfish	3.1	1.2	4.3	71.6
	Other	1.1	0.1	1.1	94.8

Source: NMFS Catch Accounting.
* withheld for confidentiality.

Change to using all allocated species as basis species for calculating MRAs

Since vessels fishing under the program have trips targeting species other than targeted rockfish, it has been suggested that all allocated species be used as a basis for calculating MRAs.[9] This expansion would allow additional catches of MRA species, but would also prevent discards of otherwise valuable, retainable fish. The effects of a change would be limited by the extent of the allocations of secondary species under the program.

The number of additional pounds of unallocated species that might be harvested increases substantially when all allocated species are included as basis species (see Table 8). Yet, Comparing potential increases in maximum retainable amounts that would arise from increasing the basis species with the catch of species managed by MRAs suggests that in the absence of substantial changes in targeting behavior, little effect on total catches of MRA limited species might arise by using all allocated species as basis species, instead of exclusively primary rockfish.

[9] Secondary species are allocated only to cooperatives. Limited access catches of all secondary species are managed by MRAs, so the limited access would not be affected by this action.

Table 8. Maximum retainable amounts by sector based on allocations of primary rockfish species and secondary species allocations (2008).

mrabaschnge

Incidental catch species	MRA as a percentage of basis species	Catcher vessel sector			
		Allocation of primary rockfish	MRA in tons based on rockfish allocation	Maximum cooperative allocation of secondary species	MRA in tons based on secondary species allocations
Shortraker/rougheye	2	6,625	133	1,034	21
Pollock	20		1,325		207
Deep water flatfish	20		1,325		207
Rex sole	20		1,325		207
Flathead sole	20		1,325		207
Shallow water flatfish	20		1,325		207
Arrowtooth flounder	35		2,319		362
Other rockfish	15		994		155
Atka mackerel	20		1,325		207
Aggregated forage fish	2		133		21
Skates	20		1,325		207
Other species	20		1,325		207

Incidental catch species	MRA as a percentage of basis species	Catcher processor sector			
		Allocation of primary rockfish	MRA in tons based on rockfish allocation	Maximum cooperative allocation of secondary species	MRA in tons based on secondary species allocations
Pacific cod	4	6,503	260	1,019	41
Pollock	20		1,301		204
Deep water flatfish	20		1,301		204
Rex sole	20		1,301		204
Flathead sole	20		1,301		204
Shallow water flatfish	20		1,301		204
Arrowtooth flounder	35		2,276		357
Other rockfish	15		975		153
Atka mackerel	20		1,301		204
Aggregated forage fish	2		130		20
Skates	20		1,301		204
Other species	20		1,301		204

Source: NMFS rockfish program allocations (2008).

Conclusion

In requesting this paper, the Council suggested its intention proceed with an amendment package to address certain issues that have arisen in the first year of the rockfish pilot program. While amendments may be useful to address those program deficiencies, the Council should be aware that an extensive package will require substantial program development, analysis, and regulation preparation, all of which will delay implementation. Given that the pilot program is scheduled to expire at the end of the 2011 season, the Council should consider whether it is more effective to develop an action to extend the life of the program that incorporates desired changes. If the Council elects to take action to extend the life of the program, it could consider a more expansive scoping process to ensure that it address all of its concerns with the program. If the Council elects to proceed with an amendment to the pilot program that does not extend the life of the program, it can proceed with the development of a purpose and need statement and the identification of alternatives for analysis at this time, to begin that process.

CHUM SALMON BYCATCH DISCUSSION PAPER

DECEMBER 2008

At the April 2008 Council meeting, the Council took action to bifurcate the analysis of management measures for Chinook and chum salmon to evaluate separately. The EIS/RIR/IRFA for the Chinook salmon management measures analysis was presented for initial review in June 2008 and staff are currently working on revising that analysis for the public review draft which is due to be published prior to the start of the December Council meeting. Final action on the Chinook salmon bycatch management measures is scheduled for April 2009.

For Chum salmon bycatch management measures, the Council modified the existing suite of alternatives (see attached April 2008 Council motion for Action 2: Non-Chinook) and indicated that further review and modification would be scheduled for the October 2008 Council meeting. The Council was unable to take up the scheduled review at that time and deferred discussion to the December 2008 Council meeting.

At this meeting, the Council will review the current suite of alternatives for Chum (Non-Chinook) salmon bycatch in the EBS pollock trawl fishery as amended in April 2008. The Council may modify the alternatives at this time and discuss an appropriate timeline for this analysis. Information contained in this paper summarizes the current bycatch trends by season and sector through 2008, the current suite of alternatives and considerations for the subsequent analysis with respect to appropriate NEPA analyses necessary as well as staff timing and availability.

TRENDS IN NON-CHINOOK (CHUM) BYCATCH

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

The majority of non-Chinook bycatch occurs in the pollock trawl fishery. Historically, the contribution of non-Chinook bycatch from the pollock trawl fishery has ranged from a low of 88% of all bycatch to a high of >99.5% in 1993. Since 2002 bycatch of non-Chinook salmon in the pollock fishery has comprised over 95% of the total. Total catch of non-Chinook salmon in the pollock fishery reached an historic high in 2005 at 705,963 fish (Table 2; Figure 1). Bycatch of non-Chinook salmon in this fishery occurs almost exclusively in the B season. Bycatch since 2005 has declined substantially, with the 2008 total of 15,383.

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

Table 1. 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

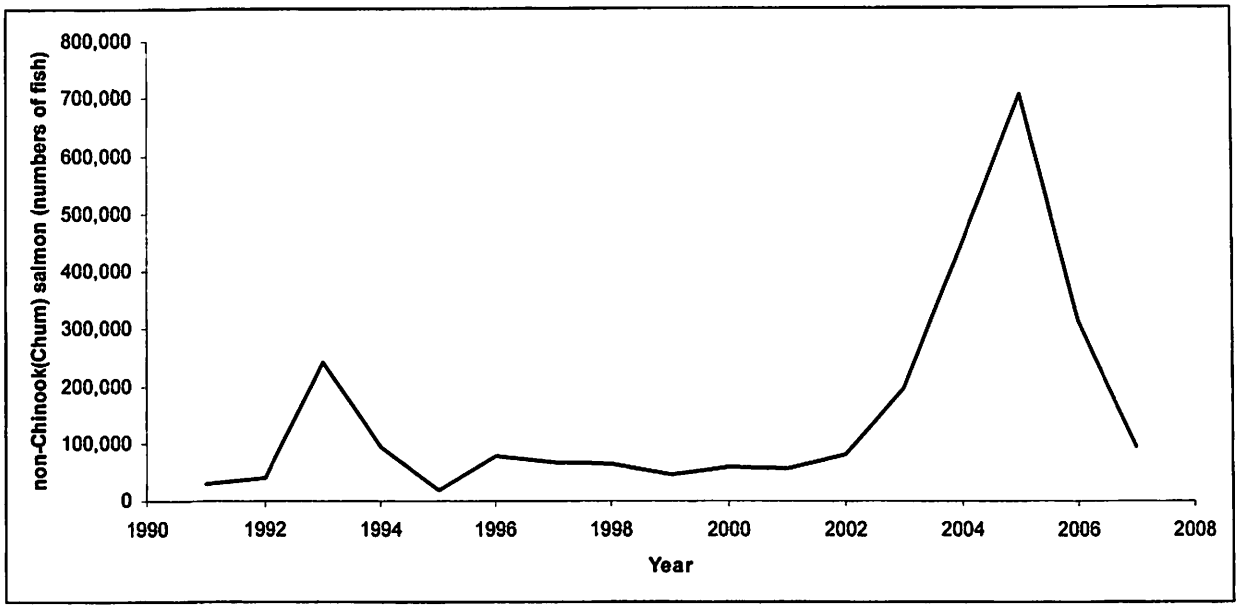

Figure 1. Non-Chinook salmon bycatch in the EBS pollock trawl fishery 1991-2007. Note 1991-1993 values do not include CDQ.

Table 2. Non-Chinook salmon catch (numbers of fish) in the BSAI pollock trawl fishery (all sectors) 1991-2008, CDQ is indicated separately and by season where available. 'na' indicates that data were not available in that year.

Year	Annual with CDQ	Annual without CDQ	Annual CDQ only	A season With CDQ	B season With CDQ	A season Without CDQ	B season Without CDQ	A season CDQ only	B season CDQ only
1991	Na	28,951	na	na	na	2,850	26,101	na	na
1992	na	40,274	na	na	na	1,951	38,324	na	na
1993	na	242,191	na	na	na	1,594	240,597	na	na
1994	92,672	81,508	11,165	3,991	88,681	3,682	77,825	309	10,856
1995	19,264	18,678	585	1,708	17,556	1,578	17,100	130	456
1996	77,236	74,977	2,259	222	77,014	177	74,800	45	2,214
1997	65,988	61,759	4,229	2,083	63,904	1,991	59,767	92	4,137
1998	64,042	63,127	915	4,002	60,040	3,914	59,213	88	827
1999	45,172	44,610	562	362	44,810	349	44,261	13	549
2000	58,571	56,867	1,704	213	58,358	148	56,719	65	1,639
2001	57,007	53,904	3,103	2,386	54,621	2,213	51,691	173	2,930
2002	80,652	77,178	3,474	1,377	79,274	1,356	75,821	21	3,453
2003	195,135	186,779	8,356	3,946	191,189	3,709	183,070	237	8,119
2004	447,626	437,429	10,197	438	447,187	409	437,019	29	10,168
2005	705,963	698,270	7,693	599	705,364	567	697,703	32	7,661
2006	310,545	309,343	1,202	2,525	308,020	2,460	306,883	65	1,137
2007	94,072	87,592	6,480	8,546	85,526	7,390	80,202	1,156	5,324
2008	15,383	14,953	430	413	14,970	340	14,613	73	357

2008 data through 11/6/08

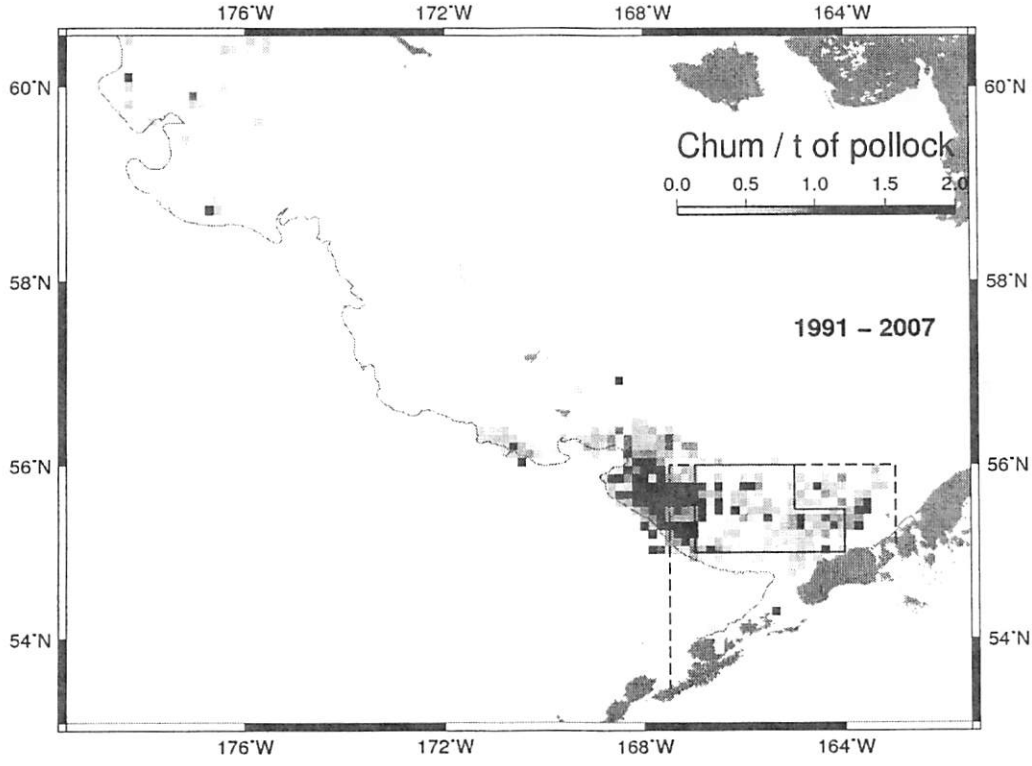

Figure 2. Historical chum B-season bycatch rates 1991-2007. Note the Chum Salmon Savings Area closure (solid line) and the Catcher Vessel Operational Area (dotted line).

Bycatch by sector from 1997-2008 (to date) is summarized in Table 3. Annual percentage contribution to the total amount by year and sector (non-CDQ) from 1997-2007 is summarized in Table 4.

Table 3 Non-Chinook bycatch in the EBS pollock trawl fishery 1997-2008 by sector. CP = catcher processor, M= Mothership, S = Shoreside catcher vessel fleet. CDQ where available is listed separately by the sector in which the salmon was caught. For confidentiality reasons CDQ catch by sector in 2008 to date cannot be listed separately. Source NMFS catch accounting (data queries run on 2/10/08 through 2007)

Year	CP	M	S	CP-CDQ	M-CDQ	S-CDQ	Total
1997	23,131	15,018	23,610	3,663	297	269	65,988
1998	8,119	6,750	49,173	na	na	na	64,042
1999	2,312	212	42,087	326	185	150	45,271
2000	4,930	509	51,428	1,161	287	256	58,571
2001	20,356	8,495	25,052	1,950	1,153	0	57,007
2002	9,303	13,873	54,002	2,051	1,423	0	80,652
2003	22,831	11,895	152,053	6,049	2,307	0	195,135
2004	76,159	13,330	347,940	8,257	1,940	0	447,626
2005	63,266	15,314	619,691	3,136	4,557	0	705,963
2006	18,180	2,013	289,150	929	273	0	310,545
2007	27,245	5,427	54,920	2,840	3,640	0	94,071

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

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

HATCHERY RELEASES OF CHUM

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

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

Combined Asian hatchery releases in 2006 (Russia, Japan, Korea) account for 76% of the total releases while Alaskan chum releases account for 24% of the total releases. Chum enhancement projects in Alaska are not active in the AYK region.

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

Year	Russia	Japan	Korea	Canada	US	Total
1999	278.7	1867.9	21.5	172.0	520.8	2,860.9
2000	326.1	1817.4	19.0	124.1	546.5	2,833.1
2001	316.0	1831.2	5.3	75.8	493.8	2,722.1
2002	306.8	1851.6	10.5	155.3	507.2	2,831.4
2003	363.2	1840.6	14.7	136.7	496.3	2,851.5
2004	363.1	1817.0	12.9	105.2	630.2	2,928.4
2005	387.3	1844.0	10.9	131.8	596.9	2,970.9
2006	344.3	1858.0	7.3	107.1	578.8	2,895.5
2007	*	*	13.8	*	*	

*2007 data not yet available

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

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

STOCK OF ORIGIN INFORMATION FOR CHUM BYCATCH

A study conducted by the National Marine Fisheries Service evaluated bycatch samples of chum salmon from the 1994-1995 pollock trawl fishery in the Eastern Bering Sea and employed genetic stock identification (GSI) methodology to evaluate the stock composition of these bycaught fish (Wilmot et al., 1998). Results from this study indicated that in 1994 between 39-55% of samples were of Asian origin, 20-35% were western Alaskan stocks, and 21-29% were from the combined Southeastern Alaska, British Columbia and Washington stocks. (Wilmot et al., 1998). The 1995 samples indicated a range of 13-51% Asian, 33-53% western Alaska, and 9-46% Southeastern Alaska, British Columbia or Washington stocks (Wilmot et al., 1998). Estimates for immature versus maturing fish differed with both years indicating that maturing fish indicating a higher contribution from BC than the contribution from the immature fish (Wilmot et al., 1998). Differences in relative stock composition also varied temporally throughout the B season and by region (Wilmot et al. 1998). Additional work is currently underway at the Auke Bay Laboratory to evaluate more recent chum bycatch samples from the pollock fishery for stock composition estimates. Results will likely be available in late 2008.

Additional studies of research trawl caught fish in the Bering Sea have looked at the origin and distribution of chum salmon (Urawa et al. 2004;). Genetic stock identification (GSI) with allozyme variation was used to determine the stock origin of chum salmon caught by a trawl research vessel operating in the central Bering Sea from late August to mid September 2002 (Urawa et al. 2004). Results indicated that the estimated stock composition for maturing chum salmon was 70% Japanese, 10% Russian and 20% North American stocks, while immature fish were estimated as 54% Japanese, 33% Russian, and 13% North American (Urawa et al. 2004). Stock composition of North American fish was identified for Northwest Alaska, Yukon, Alaskan Peninsula/Kodiak, Susitna River, Prince William Sound, Southeast Alaska/Northern British Columbia and Southern British Columbia/Washington State. Of these the majority of mature chum salmon for North America stocks came from Southern BC/Washington State and Alaska Peninsula/Kodiak (Urawa et al. 2004). For immature chum salmon, the largest contribution for North American stocks came from Southeast Alaska/Northern BC, followed by Alaska Peninsula/Kodiak and Southern BC/Washington State.

DESCRIPTION OF NON-CHINOOK SALMON (CHUM) ALTERNATIVES

The following alternatives are currently under consideration by the Council. The alternative description below includes all amendments made at the April 2008 Council meeting[1].

1.1 Alternative 1: Status Quo (non-Chinook)

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

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

[1] Note that the option 2 'cap set relative to salmon returns" as indicated in the original motion has been deleted here for consistency with discussion at the June 2008 Council meeting regarding the infeasibility of applying this cap framework at this time to salmon species.

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

1.2 Alternative 2: Hard Cap (non-Chinook)

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

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

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

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

1.2.1 Component 1: Hard Cap Formulation

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

Option 1: Range of numbers for hard cap formulation

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

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

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 originating rationale (by suboption number) for each cap number listed in Table 7. 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 8 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

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

Under this suboption, 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.

1.2.2 Component 2: Sector Allocation

If this component is selected, the hard cap would be managed at the sector level for the fishery. This would result in separate sector level caps for the CDQ sector, the inshore catcher vessel (CV) fleet, the mothership fleet and the offshore catch processor (CP) fleet. The catch of salmon would be tabulated on a sector level basis, and if the total catch in that sector reaches the cap specified for that sector, NMFS would close directed fishing for pollock by that sector for the remainder of the season. The remaining sectors may continue to fish unless they too reach their specific sector level cap. Options for hard caps are as specified under component 1, 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 9 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 10):

Table 10 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.

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 11).

Table 11 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 would be utilized for this option:

Table 12 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 13).

Table 13 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 would be utilized (Table 14):

Table 14 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 15).

Table 15 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 16 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

1.2.3 Component 3: Sector Transfer

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

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

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

1.2.3.1 Option 1: Transferable salmon bycatch caps

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

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

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

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

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

Option 1 would require that each sector receiving a transferable salmon bycatch cap be represented by a legal entity that could:

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

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

1.2.3.2 Option 2: Rollover unused salmon bycatch to other sectors

Option 2) NMFS actively manages the salmon bycatch allocations to the non-CDQ sectors and would rollover unused salmon bycatch to other sectors still fishing based on the proportion of pollock remaining for harvest.

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

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

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

Options 1 and 2 are mutually exclusive.

1.2.4 Component 4: Cooperative provisions

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

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

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

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 17–Table 20). All inshore sector catcher vessels have been part of a cooperative since 2005. However, if this component is selected by the Council, regulations would accommodate allocations of an appropriate portion of the salmon bycatch cap to the open access fishery if, in the future, a vessel or vessels did not join a cooperative. For analytical purposes, the range of cooperative allocations would be analyzed using the ranges as indicated in Table 21 and Table 22.

Table 17 Inshore cooperative allocations resulting from application of component 2, option 1 allocation to the inshore CV fleet (50% of allocation after 10% to CDQ)

			Inshore cooperative allocation:							
Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector 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 18 Inshore cooperative allocation resulting from application of component 2, option 2a allocation to the inshore CV fleet (average historical bycatch from 2004-2006)

			Inshore cooperative allocation:							
Cap Suboption	Overall fishery cap level Non-Chinook	Resulting Inshore sector 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 19 Inshore cooperative allocation resulting from application of component 2, option 2b allocation to the inshore CV fleet (average historical bycatch from 2002-2006)

			Inshore cooperative allocation:							
	Overall fishery cap level	Resulting Inshore	31.145% Akutan CV	1.146% Arctic Enterprise	9.481% Northern Victor Fleet	2.876% Peter Pan Fleet	12.191%	24.256% Unisea Fleet	18.906%	0.000% open access AFA
Cap Suboption	Non-Chinook	sector allocation	Assoc	Assoc	coop	coop	Unalaska coop	coop	Westward Fleet coop	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 20 Inshore cooperative allocation resulting from application of component 2, option 2c allocation to the inshore CV fleet (average historical bycatch from 1997-2006)

			Inshore cooperative allocation:							
	Overall fishery cap level	Resulting Inshore	31.145% Akutan CV	1.146% Arctic Enterprise	9.481% Northern Victor Fleet	2.876% Peter Pan Fleet	12.191%	24.256% Unisea Fleet	18.906%	0.000% open access AFA
Cap Suboption	Non-Chinook	sector allocation	Assoc	Assoc	coop	coop	Unalaska coop	coop	Westward Fleet coop	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 21 Range of cooperative level caps for use in analysis of impacts of component 4 as applied to component 2, option 1

			Inshore cooperative allocation:							
	Overall fishery cap level	Resulting Inshore	31.145%	1.146%	9.481% Northern	2.876% Peter	12.191%	24.256%	18.906%	0.000% open access
Cap Suboption	Non-Chinook	sector allocation	Akutan CV Assoc	Arctic Enterprise Assoc	Victor Fleet coop	Pan Fleet coop	Unalaska coop	Unisea Fleet coop	Westward Fleet coop	AFA vessels
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 22 Cap ranges for analysis of hard cap component 2, option 2 (a-c) for component 4 cooperative provision

			Inshore cooperative allocation:							
	Overall fishery cap level	Resulting Inshore	31.145%	1.146%	9.481% Northern	2.876%	12.191%	24.256%	18.906%	0.000% open access
Cap Suboption	Non-Chinook	sector allocation	Akutan CV Assoc	Arctic Enterprise Assoc	Victor Fleet coop	Peter Pan Fleet coop	Unalaska coop	Unisea Fleet coop	Westward Fleet coop	AFA vessels
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

1.2.4.1 Cooperative transfer options

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

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

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

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

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

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

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

1.3 Alternative 3: Triggered closures (non-Chinook)

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

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

1.3.1 Component 1: Trigger Cap Formulation

The trigger cap amount will be within the range of hard caps established under Alternative 2.

1.3.2 Component 2: Sector Allocation

Sector allocations are equivalent to those under consideration for hard caps.

1.3.3 Component 3: Sector Transfer

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

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

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

Option 2) NMFS will rollover unused salmon bycatch to other sectors and other cooperatives still fishing based on the proportion of pollock remaining for harvest.
The above options are mutually exclusive.

1.3.4 Component 4: Area option

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

Table 23 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'

Small area

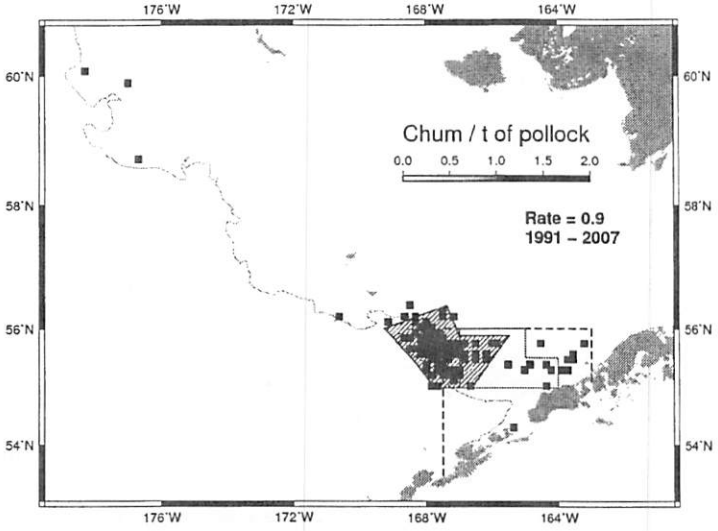

Figure 3 B-season chum salmon proposed closure over different rates based on 1991-2007 NMFS observer data. Filled in 10x10km cells represent locations where the average bycatch rate exceeded 0.9 chum salmon per t of pollock.

Table 24 Average seasonal proportions by periods for 1993-2007 based on NMFS observer data (effort is relative hours towed, salmon are relative numbers, and pollock are relative tons).

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

Table 25 Average 1993-2007 seasonal pattern of other salmon bycatch per t of pollock in and outside of candidate closure area 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%

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

Under this suboption, 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.

CONSIDERATIONS FOR ANALYSIS

Any measures under consideration for chum salmon bycatch management by the Council will be analyzed separately from actions currently under consideration for Chinook salmon bycatch. Chinook salmon bycatch measures are being analyzed in the Chinook Salmon Bycatch Management Measures EIS/RIR/IRFA scheduled for public release in early December for a public comment period. Final action by the Council on that analysis is scheduled for April 2009 after which regulations to promulgate changes to the current program will be drafted.

The specific NEPA analysis (EA or EIS) required for any chum management measures under consideration has not yet been determined. In addition to any requisite NEPA timing considerations for an analysis, it is assumed that many if not all of the current analysts on the Chinook salmon project would be tasked to work on any subsequent chum salmon analysis. As a result, the timeline for such an analysis must also consider the timeline for the Chinook analysis as described previously as the analysts themselves are currently fully tasked with production of the Chinook salmon analysis.

COUNCIL ACTION AT THIS MEETING

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

1. Review and revise as necessary the current suite of alternatives for chum salmon bycatch management measures for the EBS pollock fleet
2. Discuss NEPA analytical documentation requirements (EA vs. EIS), staff availability for analysis and timing of resulting Council action.

ATTACHMENT 1 BSAI SALMON BYCATCH MOTION APRIL 2008

[Non-Chinook portion of Council motion only]
Strike-out refers back to March 2008 staff discussion paper description of alternatives while underline represents additions.

Alternatives and options

This action shall be bifurcated such that the analysis outlined under Action 1 for Chinook comes back to the Council for Initial Review in June and Action 2 (non-Chinook) comes back in October.

~~**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 (non-Chinook)

Alternative 2: Hard Cap (non-Chinook)

Component 1: Hard Cap Formulation

Option 1: Range of numbers for hard cap formulation

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

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

Component 2: Sector Allocation

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.

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%.

Component 3: Sector Transfer

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

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

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

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

The above options are mutually exclusive.

Component 4: Cooperative provisions
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.

Option 2) Transfer salmon bycatch from other inshore cooperatives.

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

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

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

~~**Alternative 3: Fixed closures (non-Chinook)**~~

Alternative 3 ~~4~~: Triggered closures (non-Chinook)

Component 1: Trigger Cap Formulation

~~Cap formulation for trigger caps is equivalent to those under consideration for hard caps.~~

The trigger cap amount will be within the range of hard caps established under Alternative 2.

Component 2: Sector Allocation

Sector allocations are equivalent to those under consideration for hard caps.

Component 3: Sector Transfer

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

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

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

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

The above options are mutually exclusive.

Component 4: Area options

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~~

Option 1a) Small closure
~~**Option 1b)** Medium closure~~
~~**Option 1c)** Large closure~~
~~**Option 2)** Expanding area closure~~

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

Comparison of NMFS survey estimates of pollock biomass in the CVOA with pollock catch within the same region (1998-2007) suggests that expected CPUE in this region may be lower. This should be explicitly considered for the potential effect on salmon bycatch patterns in the EIS.

Table 1. Non-chinook salmon mortality in BSAI groundfish fisheries.

	Annual	Annual	Annual	A season	B season	A season	B season	A season	B season
Year	with CDQ	without CDQ	CDQ only	With CDQ		Without CDQ		CDQ only	
1991	na	30,262	na	na	na	3,016	27,246	na	na
1992	na	41,450	na	na	na	2,120	39,329	na	na
1993	na	243,270	na	na	na	1,848	241,422	na	na
1994	94,548	83,384	11,165	5,599	88,949	5,291	78,093	309	10,856
1995	21,875	21,290	585	3,033	18,842	2,903	18,387	130	456
1996	78,060	75,801	2,259	665	77,395	619	75,181	45	2,214
1997	66,994	62,765	4,229	2,710	64,285	2,618	60,148	92	4,137
1998	65,697	64,782	915	4,520	61,177	4,432	60,350	88	827
1999	47,132	46,325	807	393	46,739	378	45,947	15	792
2000	59,327	57,621	1,706	350	58,977	283	57,338	67	1,639
2001	60,731	57,440	3,291	2,903	57,828	2,719	54,721	184	3,107
2002	82,483	78,879	3,604	1,698	80,785	1,677	77,202	21	3,583
2003	197,287	188,885	8,402	4,289	192,998	4,052	184,833	237	8,165
2004	450,584	440,173	10,411	1,021	449,563	991	439,182	30	10,381
2005	709,090	700,687	8,403	1,038	708,052	998	699,689	40	8,363
2006	323,987	322,595	1,392	2,311	321,676	2,245	320,350	66	1,326
2007	97,177	89,997	7,180	9,638	87,539	8,475	81,522	1,163	6,017
2008	17,116	16,586	530	611	16,505	538	16,048	73	457

Notes Retrieval done on 11/06/2008
Non-CDQ data from 1991-2002 found in bsahalx.dbf
Non-CDQ data from 2003-2008 found in AKFISH_V_GG_PSCNQ_ESTIMATE
CDQ data from 1999-2008 found in AKFISH_V_CDQ_CATCH_REPORT_TOTAL_CATCH
CDQ data for 1998 from boatrate.dbf
CDQ data from 1992-1997 found in bsahalx.dbf
A season - January 1 to June 10
B season - June 11 to December 31

Table 2. Non-chinook salmon mortality in BSAI pollock directed fisheries.

	Annual	Annual	Annual	A season	B season	A season	B season	A season	B season
Year	with CDQ	without CDQ	CDQ only	With CDQ		Without CDQ		CDQ only	
1991	na	28,951	na	na	na	2,850	26,101	na	na
1992	na	40,274	na	na	na	1,951	38,324	na	na
1993	na	242,191	na	na	na	1,594	240,597	na	na
1994	92,672	81,508	11,165	3,991	88,681	3,682	77,825	309	10,856
1995	19,264	18,678	585	1,708	17,556	1,578	17,100	130	456
1996	77,236	74,977	2,259	222	77,014	177	74,800	45	2,214
1997	65,988	61,759	4,229	2,083	63,904	1,991	59,767	92	4,137
1998	64,042	63,127	915	4,002	60,040	3,914	59,213	88	827
1999	45,172	44,610	562	362	44,810	349	44,261	13	549
2000	58,571	56,867	1,704	213	58,358	148	56,719	65	1,639
2001	57,007	53,904	3,103	2,386	54,621	2,213	51,691	173	2,930
2002	80,652	77,178	3,474	1,377	79,274	1,356	75,821	21	3,453
2003	195,135	186,779	8,356	3,946	191,189	3,709	183,070	237	8,119
2004	440,468	430,280	10,188	422	440,046	395	429,885	27	10,161
2005	704,294	696,584	7,710	595	703,699	563	696,021	32	7,678
2006	308,459	307,245	1,214	1,326	307,133	1,260	305,985	66	1,148
2007	93,616	87,147	6,469	8,523	85,093	7,368	79,779	1,155	5,314
2008	15,383	14,953	430	413	14,970	340	14,613	73	357

Notes Retrieval done on 11/06/2008
Non-CDQ data from 1991-2002 found in bsahalx.dbf
Non-CDQ data from 2003-2008 found in AKFISH_V_GG_PSCNQ_ESTIMATE
CDQ data from 1999-2008 found in AKFISH_V_CDQ_CATCH_REPORT_TOTAL_CATCH
CDQ data for 1998 from boatrate.dbf
CDQ data from 1992-1997 found in bsahalx.dbf
A season - January 1 to June 10
B season - June 11 to December 31

Sector specific non-Chinook bycatch 1997-2008

Updated information to replace Table 3 in Staff discussion paper (D-2(c)(1))

Table 1 Non-Chinook bycatch in the EBS pollock trawl fishery 1997-2008 by sector. CP = catcher processor, M= Mothership, S = Shoreside catcher vessel fleet. CDQ where available is listed separately by the sector in which the salmon was caught. For confidentiality reasons CDQ catch by sector in 2008 to date cannot be listed separately. Source NMFS catch accounting

Year	CP	M	S	CP-CDQ	M-CDQ	S-CDQ	Total
1997	23,131	15,018	23,610	3,663	297	269	65,988
1998	8,119	6,750	49,173	na	na	na	64,042
1999	2,312	212	42,087	326	185	150	45,271
2000	4,930	509	51,428	1,161	287	256	58,571
2001	20,356	8,495	25,052	1,950	1,153	0	57,007
2002	9,303	13,873	54,002	2,051	1,423	0	80,652
2003	22,785	11,894	146,104	6,049	2,307	0	189,139
2004	76,134	13,330	340,820	8,459	1,949	0	440,692
2005	62,963	15,312	618,589	3,567	4,559	0	704,990
2006	18,061	2,010	288,589	974	275	0	309,909
2007	27,198	5,424	54,554	3,380	3,792	0	94,348
2008	1,526	641	12,397	451	0	0	15,015

AP minutes from October 2008 on Non-Chinook Salmon Bycatch

C-4 (a) BSAI Non-Chinook Salmon Bycatch

The AP recommends that the Council request staff proceed with the development of an initial review draft analysis on Non Chinook Salmon Bycatch Reduction Measures in the BSAI Pollock Trawl Fisheries.

Recommended draft purpose and need as well as draft alternatives, elements and options are as follows:

AP DRAFT PURPOSE AND NEED STATEMENT

An effective approach to minimizing non-chinook salmon bycatch 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. Non-chinook salmon (primarily made up of chum salmon) harvested as bycatch in the Bering Sea pollock trawl fishery 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 and subsistence fisheries in Western Alaska. At times, Bering Sea bycatch may have contributed to observed low returns in these river systems.

Conservation concerns acknowledged by the Council during the development of the Salmon Savings Areas have not been resolved. Hard caps, area closures, and/or other measures may be needed to reduce salmon bycatch to the 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. Non-chinook salmon bycatch must be minimized 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.

Alternatives and options

NON-CHINOOK SALMON (CHUM)
Alternative 1: Status Quo (non-Chinook)
Alternative 2: Hard Cap (non-Chinook)

Component 1: Hard Cap Formulation

Option 1: Range of numbers for hard cap formulation

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

Component 2: Sector Allocation

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.

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%.

Component 3: Sector Transfer

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

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

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

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

The above options are mutually exclusive.

Component 4: Cooperative provisions

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.

Option 2) Transfer salmon bycatch from other inshore cooperatives.

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

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

Alternative 3 -4: Triggered closures (non-Chinook)

Component 1: Trigger Cap Formulation

The trigger cap amount will be within the range of hard caps established under Alternative 2.

Component 2: Sector Allocation

Sector allocations are equivalent to those under consideration for hard caps.

Component 3: Sector Transfer

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

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

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

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

The above options are mutually exclusive.

Component 4: Area options

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

Option 1a) Small closure

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

Motion passed 18/0.

Draft Action Plan for Non-Chinook (chum) salmon bycatch measures: 12/2/08

Proposed Action:
Chum Salmon bycatch management measures

Problem Statement/Objective:

The AP drafted a problem statement which is included in the Council briefing books for December, no problem statement yet approved by Council for this specific action.

NEPA analysis:
TBD re EA or EIS

Range of Alternatives:
Current alternatives (to be modified by Council December 2008):

Alternative 1: status quo (Exemption to SSA closure)
Alternative 2: Hard cap

1. range 58,176-488,045
2. sector splits:
    a. AFA
    b. 5 year average (2002-2006)
    c. 10 year average (1997-2006)
3. sector transfer
4. cooperative provisions (including cooperative transfer provisions)

Alternative 3: Triggered closure:
Single area closure with cap ranges and sector split options similar to Alternative 2. No cooperative provisions.

Fishery Management Action Team:

Council: Diana Stram, others TBD
NMFS AFSC: Jim Ianelli
NMFS RO analytical team: Scott Miller, others TBD
NMFS RO Sustainable Fisheries: TBD: likely Sally Bibb, Gretchen Harrington, others?

Other necessary staff resources:
NOAA GC: Demian Shane

NMFS HQ liaison:
TBD

Time line for Analyses (Council actions in **bold**): Note timing for implementation of Chinook action is for January 2011. Timing for implementation of any chum management action is not yet determined.

Month	Actions for Chum	Actions for Chinook
December 2008: Council Meeting 8-16	**Refine alternatives for chum analysis, discuss timeline**	Workshop on industry-incentive based programs for Chinook; Yukon River Panel presentation by staff, dialog between Panel members and Council members
January 2009		Salmon Bycatch Workgroup meeting (1/20) to review and comment on incentive based programs for bycatch reduction; Nome outreach meeting (1/22); NMFS Tribal consultation in Nome (1/22) Staff preparing report of outreach meetings for Council review
February 2009 Council meeting 2-10	Action as necessary	**SSC/AP/Council review of industry incentive based programs for Chinook bycatch reduction, receive SBW report and recommendations.** Staff preparing report of outreach meetings for Council review Staff responding to comments on EIS and preparing Comment Analysis Report (CAR) for Council review.
March 2009	Preliminary analysis of chum alternatives Outreach meetings as necessary	Staff responding to comments on EIS and preparing Comment Analysis Report (CAR) for Council review.
April 2009 Council meeting Mar 30-Apr 7	**Refine alternatives for Chum (after action on Chinook):** Preliminary analysis of chum alternatives Outreach meetings as necessary	**Final action on Chinook management measures: receive outreach report, receive CAR, review EIS analysis, select final preferred alternative;** NMFS staff to prepare proposed rule and regulatory package
May 2009	Preliminary analysis of chum alternatives	NMFS staff to prepare proposed and final rule and regulatory package. Specifics of this include the following: Proposed rule/NOA published by December 1, 2009 with a 60 day comment period (ends February 1, 2010) Thus FMP amendments must be approved, disapproved, or partially approved by NMFS by March 1, 2010 Record of decision on the EIS must be signed at the time of FMP amendment approval Final rule published no later than September 1, 2010 ICA due to NMFS for review by October 1, 2010 (decision must be made on ICA by December 2010)
June 2009	**Discussion paper (tentative) on preliminary review of chum alternatives; revise as necessary**	
July-September 2009	Staff analysis of initial review draft; finalized for Council distribution mid-September Outreach meetings as necessary	
October 2009 Council meeting 1-10	**Initial review of Chum analysis, select PPA**	
December 2009	**Final action (tentative)**	

Other considerations for analytical timeframe for chum:

Genetics data: It is not yet clear when new information will be made available on the stock of origin of chum salmon bycatch from the pollock fishery. These analyses are currently on-going and results from them critical to any analysis of the impact of chum bycatch on river systems for this analysis. Based on discussions with AFSC staff it is likely that no additional information on recent bycatch stock of origin will be available prior to fall 2009.

ADF&G information availability: As with the Chinook EIS it will be critical to work with ADF&G staff for stock status of chum stocks as well as salmon fishery(commercial, subsistence and recreational) information. Enhanced involvement by ADF&G staff in writing sections and/or producing overview reports of comprehensive stock status and fishery information to be referenced in the analysis would be helpful.

Concurrent staff tasking: Not all NPFMC or NMFS staff are involved in each of the items as listed above, however many staff members have additional responsibilities for other analyses and on-going work. In particular, some key staff are not available during concurrent stock assessment time periods (for crab during May and September and groundfish during September-November).

Regional outreach meetings: The Council needs to determine if staff resources will be prioritized for participation in regional outreach meetings as with the Chinook EIS outreach schedule.

UNITED STATES DEPARTMENT OF (
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

December 2, 2008

Mr. Eric Olson, Chairman
North Pacific Fishery Management Council
605 W. 4th Avenue #306
Anchorage, AK 99501-2252

Dear Mr. Olson:

Although the North Pacific Fishery Management Council (Council) is considering an analysis of alternatives to minimize non-Chinook salmon bycatch to the extent practicable in the Bering Sea pollock fishery, we have yet to determine whether an Environmental Assessment (EA) or an EIS would be the appropriate NEPA document. The type of NEPA document depends on the nature of the proposed action, the potential for controversy regarding the impacts, and the potential for unknown or significant impacts of any non-Chinook salmon bycatch level or changes to the pollock fishery. However, to ensure timely implementation of changes to the non-Chinook bycatch measures, we recommend starting the NEPA scoping process in January 2008, in the event that the analysis indicates that an EIS is necessary. Starting the NEPA scoping process does not preclude preparing an EA, if that is determined to be the appropriate NEPA document.

The first step in the NEPA scoping process is to notify the public of the agency's intent to prepare an EA or EIS by publishing a Notice of Intent (NOI) in the Federal Register. The NOI must include a description of the proposed action, possible alternatives to the proposed action, and a description of the scoping process. We have prepared the enclosed draft NOI and would appreciate the Council's review of the NOI's description of the proposed action, the preliminary range of alternatives, and preliminary identification of issues to be analyzed.

The NOI contains a preliminary range of alternatives based on the Council's Chum Salmon Bycatch Discussion Paper (December 2008), with the addition of a possible alternative that would be similar to the program the Council recommends for Chinook salmon bycatch management. The details of this alternative could be developed in April 2009 after the Council takes final action for Chinook salmon and would not impact the timing for implementation of the Chinook action. Additionally, we suggest the Council consider whether the trigger closures are a reasonable alternative given the evaluation of trigger closures for Chinook salmon in the Bering Sea Chinook Salmon Bycatch Management EIS and the Scientific and Statistical Committee's (SSC) recommendation from its April 2008 minutes. These minutes state that "the SSC recommends deleting alternatives that do not meet the problem statement's goal of reducing bycatch. To this end, the Council should consider removing alternatives for fixed closed areas and triggered closures that would be similar, in kind, to past implementation of the triggered closures of the Salmon Savings Areas. Over time, these area closures have been found to be insufficient to reduce bycatch."

With Council concurrence, we would publish the NOI in January and start the scoping period. The scoping period would end in March 2009 and the scoping comments would be provided to the Council for its April 2009 meeting to possibly refine the non-Chinook salmon alternatives. Depending on the scope of the alternatives and staff resources, the Council could review the initial draft EA or EIS and associated analyses required under the Magnuson Stevens Act and other applicable law in October 2009 or later.

We look forward to working with the Council as it proceeds to assess potential changes to the Bering Sea pollock fishery to minimize bycatch of non-Chinook salmon and develops the supporting analysis.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region

Enclosure (Draft Notice of Intent)

BILLING CODE:

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN XXX

Fisheries of the Exclusive Economic Zone Off Alaska; Groundfish Fisheries in the Bering Sea and Aleutian Islands

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; intent to prepare an environmental impact statement or environmental assessment; request for written comments.

SUMMARY: NMFS, in consultation with the North Pacific Fishery Management Council, announces its intent to prepare either an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) on measures to minimize non-Chinook salmon bycatch in the Bering Sea, in accordance with the National Environmental Policy Act of 1969. The proposed action would replace the current Chum Salmon Savings Area in the Bering Sea, and the specific exemption to the area closure, with new regulatory closures, salmon bycatch limits, or a combination of both. The scope of the EIS or EA will be to determine the impacts to the human environment resulting from the measures to minimize non-Chinook salmon bycatch. NMFS will accept written comments from the public to determine the issues of concern and the appropriate range of alternatives for analysis.

DATES: Written comments must be received by March 23, 2009.

ADDRESSES: Written comments on issues and alternatives should be sent to Sue Salveson, Assistant Regional Administrator, Sustainable Fisheries Division, Alaska Region, NMFS, Attn: Ellen Sebastian. Comments may be submitted by

- E-mail: XXX. Include in the subject line the following document identifier: XX. E-mail comments, with or without attachments, are limited to 5 megabytes;
- Mail: P.O. Box 21668, Juneau, AK 99802;
- Hand Delivery to the Federal Building: 709 West 9th Street, Room 420A, Juneau, AK; or
- Fax: 907-586-7557.

All Personal Identifying Information (e.g., name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information.

NMFS will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe portable document file (pdf) formats only.

FOR FURTHER INFORMATION CONTACT: Gretchen Harrington, (907) 586-7228.

SUPPLEMENTARY INFORMATION

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the United States has exclusive fishery management authority over all living marine resources found within the exclusive economic zone. The management of these marine resources, with the exception of certain marine mammals and birds, is vested in the Secretary of Commerce. The North Pacific Fishery Management Council (Council) has the responsibility to

prepare fishery management plans for those marine resources off Alaska requiring conservation and management. Management of the Federal groundfish fishery in the Bering Sea is carried out under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (FMP). The FMP, its amendments, and implementing regulations (found at 50 CFR part 679) are developed in accordance with the requirements of the Magnuson-Stevens Act and other applicable Federal laws and executive orders, notably the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA).

The Council is considering new measures to minimize non-Chinook salmon bycatch in the Bering Sea pollock fishery because of the potential negative impacts on salmon stocks in general, and on western Alaska salmon stocks in particular. Four species of salmon (sockeye, coho, pink, and chum) are aggregated into a "non-Chinook salmon" species category for catch accounting and prohibited species catch limits. Chum salmon comprises over 99.6% of the total catch in this category. The majority of non-Chinook bycatch occurs in the pollock trawl fishery during the B season (June 10 to November 1). Historically, the portion of the non-Chinook bycatch from the pollock trawl fishery has ranged from 88% to over 99.5% of all non-Chinook salmon bycatch in the federal groundfish fisheries. Since 2002, bycatch of non-Chinook salmon in the pollock fishery has comprised over 95% of the total non-Chinook salmon bycatch.

From 1991 through 2002, the average annual bycatch in the Bering Sea pollock fishery was 72,668 non-Chinook salmon. From 2003 through 2006, non-Chinook salmon bycatch numbers increased substantially to a historic high of 704,989 non-Chinook salmon in 2005. Bycatch since 2006 has declined substantially, with a 2008 bycatch of 15,002 non-Chinook salmon. The numbers of non-Chinook salmon bycatch in the Bering Sea pollock fishery from

2003 through 2008 are shown in the following table:

Year	Number of non-Chinook salmon
2003	195,135
2004	440,692
2005	704,989
2006	309,676
2007	94,349
2008	15,002

NMFS and the Council are initiating scoping in the event that an Environmental Impact Statement (EIS) is the required NEPA document for the proposed action and its alternatives. We are seeking information from the public through the scoping process on the range of alternatives to be analyzed, and on the environmental, social, and economic issues to be considered in the analysis. Written comments generated during this scoping process will be provided to the Council and incorporated into the EIS, or the EA if we determine that an EIS is not required.

Chum Salmon Savings Area and Prohibited Species Catch Limit

The Chum Salmon Savings Area in the Bering Sea is a time-area closure designed to reduce overall non-Chinook salmon bycatch in the federal groundfish trawl fisheries. This time-area closure was adopted based on historically observed salmon bycatch rates and was designed to avoid areas and times of high non-Chinook salmon bycatch. The Chum Salmon Savings Area is closed to pollock fishing from August 1 through August 31 of each year. Additionally, if the prohibited species catch limit of 42,000 non-Chinook salmon are caught by vessels using trawl gear in the Catcher Vessel Operational Area during the period August 15 through October 14, the

Chum Salmon Savings Area remains closed to directed fishing for pollock for the remainder of the calendar year.

Non-CDQ and CDQ pollock vessels participating in an inter-cooperative agreement (ICA) using the Voluntary Rolling Hotspot System (VHRS) are exempted from closures of the Chum Salmon Savings Area. The purpose of the VHRS ICA is to use real-time salmon bycatch information to avoid areas of high non-Chinook salmon bycatch rates. The ICA utilizes a system of base bycatch rates, assignment of vessels to tiers based on bycatch rates relative to the base rate, a system of closures for vessels in certain tiers, and monitoring and enforcement through private contractual arrangements. The VRHS ICA was necessary because comparisons of non-community development quota (non-CDQ) vessels fishing outside of the salmon savings areas with CDQ vessels fishing inside of the salmon savings areas indicated that salmon bycatch rates were much higher outside of the savings areas and closures were displacing vessels to higher bycatch areas.

Proposed Action

The proposed action is to replace the current Chum Salmon Savings Areas and the VRHS ICA regulations with new regulatory closures, salmon bycatch limits, or a combination of both based on current salmon bycatch information. The purpose of the proposed action is to minimize non-Chinook salmon bycatch to the extent practicable while achieving optimum yield from the pollock fishery. The proposed action is necessary to ensure long-term conservation and abundance of salmon, maintain a healthy marine ecosystem, provide maximum benefit to fishermen and communities that depend on salmon and pollock, and comply with the Magnuson-Stevens Act.

Alternative Management Measures

We will evaluate a range of alternative management measures for the Bering Sea pollock fishery. Alternatives may be formulated based on the elements identified here, and those developed through the public scoping and Council processes. Possible alternatives could be constructed from one or more of the following measures:

1. Hard Cap– Establish a hard cap for non-Chinook salmon bycatch in the CDQ and non-CDQ pollock fisheries. The eight hard cap options range from 58,176 to 488,045 non-Chinook salmon. Hard caps could be apportioned to the CDQ and non-CDQ pollock fisheries or divided among the fishery sectors. Sector level caps could be further divided among the cooperatives. Fishery participants would be required to stop fishing when the hard cap is reached.

2. Develop a non-Chinook salmon bycatch management program similar to the bycatch management program adopted by the Council for Chinook salmon - The preliminary preferred alternative for Chinook salmon is analyzed in the Draft Environmental Impact Statement/Regulatory Impact Review/Initial Regulatory Flexibility Analysis available on the NMFS Alaska Region web page at http://alaskafisheries.noaa.gov/sustainablefisheries/bycatch/default.htm. The Council may modify this preliminary preferred alternative when it takes final action in April, 2009. In April, the Council could assess whether components of the Chinook salmon program might also be appropriate for reducing bycatch of non-Chinook salmon and specify the details of such an alternative for analysis.

3. Triggered area closure – Establish a salmon savings area closure based on current salmon bycatch information. These closures would occur once a specified cap level was reached.

Preliminary Identification of Issues

A principal objective of the scoping and public input process is to identify potentially significant impacts to the human environment. The analysis will evaluate the impacts of the alternatives for all resources, species, and issues that may be directly or indirectly affected by non-Chinook salmon bycatch in the Bering Sea pollock fisheries. The following components of the biological and physical environment may be evaluated: (1) target and non-target fish stocks, forage fish, and prohibited species, including salmon species; (2) species listed under the ESA and their critical habitat; (3) seabirds; (4) marine mammals; and (5) the ecosystem.

Social and economic impacts also would be considered in terms of the effects that changes to non-Chinook salmon bycatch management measures would have on the following groups of individuals: (1) those who participate in harvesting pollock; (2) those who process and market pollock and pollock products; (3) those who consume pollock products; (4) those who rely on living marine resources caught in the management area, particularly non-Chinook salmon; (5) those who benefit from subsistence, commercial, and sport salmon fisheries; and (6) fishing communities.

Public Involvement

Scoping is an early and open process for determining the scope of issues to be addressed in an EIS or EA and for identifying the significant issues related to the proposed action. A principal objective of the scoping and public involvement process is to identify a range of reasonable of management alternatives that will delineate critical issues and provide a clear basis

for distinguishing among those alternatives and selecting a preferred alternative. Through this notice, we are notifying the public that a NEPA analysis and decision-making process for this proposed action has been initiated so that interested or affected people may participate and contribute to the final decision.

We are seeking written public comments on the scope of issues, including potential impacts, and alternatives that should be considered in revising non-Chinook salmon bycatch management measures. Written comments will be accepted at the address above (see ADDRESSES). Written comments should be as specific as possible to be the most helpful. Written comments received during the scoping process, including the names and addresses of those submitting them, will be considered part of the public record of this proposal and will be available for public inspection.

The public is invited to participate and provide input at Council meetings where the latest scientific information regarding salmon bycatch in the Bering Sea pollock fishery is reviewed and alternative non-Chinook salmon bycatch reduction measures are developed and evaluated. Notice of future Council meetings will be published in the Federal Register and posted on the Internet at http://alaskafisheries.noaa.gov/. Please visit this website for more information on this proposed action and for guidance on submitting effective public comments.

Dated:

Chinook Salmon and *Chinoecetes Bairdi* Crab Bycatch in Gulf of Alaska Groundfish Fisheries

November 2008

Staff Discussion Paper

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1 Introduction

Since the implementation of the groundfish fishery management plans for Alaska, the North Pacific Fishery Management Council (Council) has adopted measures intended to control the bycatch of species taken incidentally in groundfish fisheries. Certain species are designated as 'prohibited' in the groundfish fishery management plans, as they are the target of other domestic fisheries. Catch of these species and species groups must be avoided while fishing for groundfish, and when incidentally caught, they must be immediately returned to sea with a minimum of injury[1]. These species include Pacific halibut, Pacific herring, Pacific salmon, steelhead trout, king crab, and tanner crab.

To further reduce the bycatch of these prohibited species, various bycatch control measures have been instituted in the Alaska groundfish fisheries (a history is provided in NMFS 2004, Appendix F.5). In the Gulf of Alaska (GOA) groundfish fisheries, halibut bycatch limits (which close the groundfish target fisheries after the limits are reached) and bottom trawl seasonal and permanent closure areas to protect red king crab have been established. To date, no bycatch control measures have been implemented for salmon or other crab species taken incidentally in GOA groundfish fisheries.

The Council has at various times in the past several years requested staff prepare and update discussion papers examining the scope of salmon and crab bycatch in the GOA groundfish fisheries, and proposing management options that might be considered to regulate such bycatch. Most recently, in June 2008, the Council limited the scope of the discussion paper to focus on two species and two areas with potentially high bycatch levels: Chinook salmon (*Oncorhynchus tshawytscha*) and *Chinoecetes bairdi* Tanner crab, in the central and western GOA. This discussion paper provides a general overview of the available information on bycatch levels (Section 2 for Chinook, and Section 6 for *C. bairdi* crab), and species abundance and directed fisheries (Sections 5 and 7 for Chinook and crab, respectively). Preliminary alternatives have been proposed for bycatch management measures in previous iterations of this discussion paper, and they are included here (Section 8.1), along with strawman closure areas that may be considered for managing bycatch (Section 8.3).

2 Data sources used in this discussion paper

Catch and bycatch data were obtained from the NMFS catch accounting database, and analyzed to represent the amount, species composition, timing, and location of salmon and crab caught incidentally in GOA groundfish fisheries. The process that is used to estimate bycatch for GOA groundfish fisheries is described in Section 2.1. Because most vessels in participating in the GOA groundfish fisheries are not required to have 100% observer coverage, an estimation procedure is used to extrapolate bycatch and discard rates on observed vessels to the fleet as a whole. The data resulting from this process is used in Sections 4.1 and 4.2 for Chinook salmon, and Sections 6.2, 6.3, and 6.5 for *C. bairdi*. Further discussion on the proportion of GOA groundfish fisheries that are observed is addressed in Section 2.2.

Spatial analysis of bycatch in this discussion paper used only the data directly from observed vessels, and is described in Section 2.3. The spatial analysis is used to describe the location of bycatch (Sections 4.3 and 6.4), as well as to develop preliminary strawman closures under the management options (Section 8.3). Abundance estimates for crab were provided by Alaska Department of Fish and Game (ADFG) staff from the ADFG survey, and are included in Section 7.

[1] Except when their retention is authorized by other applicable law, such as the Prohibited Species Donation Program.

2.1 Estimation procedures for bycatch and discards in the Alaska groundfish fisheries

The Alaska Region manages groundfish and prohibited species catch (PSC) under Fishery Management Plans for Groundfish of the Bering Sea/Aleutian Islands and for the Gulf of Alaska. The Alaska Region estimates bycatch (here defined as PSC) and discards (non-retained catch) based on data from the North Pacific Groundfish Observer Program, Weekly Production Reports (WPR), and Alaska Department of Fish and Game fish tickets. The observer data is used to create bycatch and discard rates, and landings data (observer data, fish tickets or WPRs) is multiplied against the rates to provide bycatch and discard estimates. In the Alaska Region, the source for landings data is observer data for 100% observed vessels, WPR data for catcher/processors with 30% observer coverage, and fish tickets for all shoreside deliveries. The estimation procedures for bycatch and discards rely on two key components of the catch accounting system of which they are a part. First, the estimation procedures are designed to provide a quick turn-around of the data so that inseason management has useable rates as quickly as possible after receiving the landing reports and the observer data. The system makes maximum use of small amounts of observer data quickly (at coarser aggregation levels) which are updated and refined as more data becomes available. Secondly, although complex, the system is designed so that changes to the management structure could be mirrored in the catch accounting structure to allow inseason management to stay current with fisheries regulations and specifications.

PSC and discard estimates are based on observer data, and are calculated using separate procedures. The estimation procedures are run daily and the estimates for the current year are recalculated and refreshed daily to incorporate new data or any edits to existing data. It is assumed that unobserved vessels have incidental catch rates, and the bycatch and discard rates are applied to unobserved hauls as well[2].

Prohibited species bycatch estimation

Management of PSC species is based solely on an estimation procedure described below rather than reported catch. Vessels are required to return all PSC to the sea with minimal injury.

All observer data is used in the calculation of PSC bycatch rates. All possible rates at five levels of aggregation are calculated daily. As landings data is updated or received, bycatch estimates are created by finding the best possible matching rate and multiplying the landed catch by the best rate. PSC is managed, and rates are calculated, in numbers of animals for crab and salmon, and in weights for halibut and herring.

Rates for each PSC species are calculated at the following levels of aggregation:

- Precedence 50 CV. Vessel specific catcher vessel (CV) rate aggregated by:
  - Vessel ID, year, trip target date, and fisheries management plan (FMP) area (BSAI or GOA);
- Precedence 50 CP. Vessel specific catcher processor (CP) rate aggregated by:
  - Vessel ID, year, trip target date, gear, federal reporting area, special subarea;
- Precedence 40. Sector specific 3-week average aggregated by:
  - Year, trip target code[3], week end date, processing sector (CV, CP, or Mothership), gear, federal reporting area, special subarea;

[2] PSC and discard estimates are also calculated for catch in the State Pacific cod fishery that sets its guideline harvest level based on the Federal Pacific cod acceptable biological catch.
[3] Targets include: A - Atka Mackerel, B - Bottom trawl Pollock, C - Pacific cod, D - Deepwater flatfish (GOA only), E - Alaska plaice, F - Other flatfish, H - Shallowwater flatfish (GOA only), I - halibut (directed), K - rockfish, L - flathead sole, O - Other groundfish, P - Pelagic pollock, rocksole (BSAI only), S - sablefish, T - Greenland turbot, W - arrowtooth flounder, X - Rex sole (GOA only), and Y - Yellowfin sole (BSAI only).

- Precedence 30. Across-sector 3-week average aggregated by:
  - Year, trip target code, week end date, gear, federal reporting area, special subarea;
- Precedence 20. FMP area rate aggregated by:
  - Year, trip target code, gear, FMP area.

Rates are calculated by summing the total number or weight of observed PSC and dividing by the total groundfish weight (retained and discarded catch of groundfish) of sampled observer hauls at the above levels of aggregation. Note that hauls or sets with no PSC are included in the denominator. At the end of 2005, 26,413 individual PSC rates were calculated for the 7 PSC species, and 134,604 estimates were calculated from these rates. The three-week averages in Precedence levels 30 and 40 above are 3-week moving averages that include catch from the previous and following weeks. At least 3 observed hauls or sets must be included in the average before it is used in the matching process.

As an example of the process, consider the case where the best rate available was Precedence 30. Each night the suite of all possible rates are calculated to include the most current data. When the reported catch from an unobserved catcher vessel from the GOA fishing in the Pacific cod target with hook and line gear in reporting area 630 is received, for example as a fish ticket from a shoreside plant, the program searches for a matching PSC rate. Since the vessel was unobserved, no vessel specific rates will be found (Precedence 50). If no observed trips were made by a similarly situated catcher vessel during the three-week period including the prior and the following weeks, no rate at Precedence 40 would be created for the match. The program would then look for a matching rate at the next precedence level (30) which would include observed bycatch by any observed vessel using hook and line gear in the Pacific cod target in reporting area 630, including catcher/processors or catcher vessels delivering to motherships. Upon finding a match, the catch would be multiplied by the Precedence 30 rate, providing an estimate of PSC.

The information in this section was provided by Martin Loefflad, Fisheries Monitoring and Analysis Division, Alaska Fisheries Science Center. Detailed information on 2008 observer sampling protocols can be found at: http://www.afsc.noaa.gov/Quarterly/jfm2008/jfm08feat.pdf.

In order to continue to improve the system for managing groundfish and prohibited species catch, the Alaska Fisheries Science Center has contracted with a consultant to review the current data and data systems used for inseason management and catch accounting in the Alaska Region. The purpose of the contract is to identify the type of data that is available, and its limitations, and to look at the statistical assumptions associated with all estimation procedures. It is intended that the evaluation will result in recommendations for practical system design changes to incorporate statistical uncertainty into estimates of catch and bycatch.

2.2 Proportion of GOA groundfish catch that is observed

The North Pacific Groundfish Observer Program collects catch and bycatch data used for management and inseason monitoring of groundfish fisheries. Since 1990, all vessels larger than 60 ft (length overall) participating in the groundfish fisheries have been required to have observers onboard at least part of the time. The amount of observer coverage is based on vessel length. No vessels less than 60 ft are required to have observers onboard. Trawl and hook and line vessels that are 60 ft to 125 ft must have an observer onboard for 30% of fishing days, by quarter. Similar gear vessels that are larger than 125 ft must have an observer onboard 100% of the time, and shore-based processing facilities must have an observer present for 100% of the time. All pot vessels greater than 60 ft LOA must have observer coverage while 30% of their pots are pulled for the calendar year.

There is a greater prevalence of smaller vessels participating in the GOA groundfish fisheries, and over the past 10 years, participation by smaller vessels in the GOA groundfish fisheries has generally

increased, particularly catcher vessels less than 60 ft length overall (NPFMC 2003). Because observer coverage requirements are generally based on vessel length, the proportion of total catch that is observed in GOA groundfish fisheries is much lower than, for example, in the Bering Sea fisheries. The majority of the GOA fleet is subject to 30% observer coverage. Table 1 illustrates the total groundfish catch in the GOA, the total amount of groundfish that is caught while an observer is onboard the vessel, and the resulting percentage. In the western GOA, the proportion of catch that is caught while an observer is onboard ranges from 25-36% over the years 2004-2007; in the central GOA the range is from 32% to 37%. In comparison, the average percentage of observed catch in the Bering Sea is approximately 86%, and in the Aleutian Islands is approximately 95%. The precision of bycatch estimates depends upon the number of vessels observed and the fraction of hauls sampled (Karp and McElderry 1999). Because of the relatively lower levels of observer coverage in the GOA, estimates of salmon and crab bycatch are less precise in the GOA than in Bering Sea groundfish fisheries.

Table 1 Total catch, observed catch, and percent observed catch by area and year

Area	Year	Total (mt)	Observed (mt)	Percent
Western GOA	2004	50,853	14,414	28%
	2005	53,142	13,195	25%
	2006	51,944	17,253	33%
	2007	46,968	16,882	36%
Central GOA	2004	108,707	37,744	35%
	2005	120,030	41,586	35%
	2006	131,271	42,349	32%
	2007	118,871	44,113	37%
Eastern GOA	2004	7,610	2,911	38%
	2005	8,709	3,072	35%
	2006	8,772	3,293	38%
	2007	4,274	3,225	75%
Bering Sea	2004	1,695,228	1,450,413	86%
	2005	1,702,671	1,467,153	86%
	2006	1,696,337	1,470,680	87%
	2007	1,569,110	1,352,914	86%
Aleutian Islands	2004	98,169	93,188	95%
	2005	94,209	89,516	95%
	2006	95,288	91,461	96%
	2007	107,090	101,060	94%

Note: This table does not include jig gear, but otherwise includes all targets.
Source: http://www.fakr.noaa.gov/sustainablefisheries/inseason/percent_observed.pdf

Detailed information on actual observed coverage levels in the GOA groundfish fisheries has been presented to the Council meeting as part of their reports from the Observer Advisory Committee, most recently at the April 2008 Council meeting. NMFS compiled a series of tables that provides a breakout of the percentage of harvest observed for each year 2004–2007, inclusive, in order to evaluate the effective rate of coverage in particular target fisheries. The data are broken out by observer coverage category (30%, 100%), gear type, area, and component of the catch by the <60' fleet that is unobserved.[4] The information for the central GOA and the western GOA is presented in Table 2 and Table 3, respectively.

[4] Note that the total catch data referenced is from the NMFS catch accounting system, and the observer data is from the NMFS observer database. The observer data includes all sampled and unsampled hauls that occurred while an observer was onboard. High variability in percent observed catch among years has been correlated to several factors, such as the varying season lengths, number of participating vessels, different catch rates per year, weather, and market prices.

Information in the tables pertinent to the discussion of fisheries in the GOA is summarized below. For the GOA Pacific cod pot fisheries, more than half the catch from 2004–2007 came from the <60 ft fleet, which is unobserved. The remaining catch primarily came from the >60 ft to <125 ft fleet where percent coverage ranged from 17-28% over the four years. For the Pacific cod trawl fisheries delivering shoreside, coverage in the >60 ft to <125 ft category ranged from 24%–30% in this time frame.

For the pollock pelagic trawl fishery, data is mostly confidential for the unobserved <60 ft fleet each year, except in the western GOA in 2006 and 2007 where catch represented 54-71% of the total. The remaining catch came from the >60 ft to <125 ft fleet where coverage ranged from 31%–37% over the four years, with the exception of 51% coverage in the western GOA in 2005. For non-pelagic trawl arrowtooth flounder and shallow water flatfish targets delivered shoreside, the majority of the catch was in the >60 ft to <125 ft category and percentage covered ranged from 13%–34% over the three-year period. Catch of flatfish in the catcher processor fleet was largely in the >60 ft to <125 ft category, with the exception of arrowtooth flounder in the central GOA, and percentage covered varied widely.

At various times, it has been suggested that vessels might volunteer to take observers onboard even when it is not required under observer coverage requirements, in order to increase the proportion of catch that is observed in the GOA, particularly in certain fisheries or areas of interest, and hopefully to increase the accuracy of catch accounting extrapolations based on observer data. Currently, there is an outstanding regulatory issue that prevents observer providers from working with the fishing industry outside of providing observers as mandated under the regulations, because observer providers must not have a financial interest other than the provision of observers.

In 2008, there was one instance of a 58 ft catcher vessel fishing in the western GOA Pacific cod fishery taking an observer on board. The vessel's incentive was to demonstrate that the western GOA has lower halibut bycatch rates than the central GOA, and as there were no vessels larger than 60 ft fishing in the western GOA, all catch from that area was assigned central GOA halibut bycatch rates. The problem with using observer data obtained in this voluntary manner is that it introduces a potential for bias, as the industry would control the time, area, etc. of the observer data.

Table 2 **Central Gulf of Alaska total catch (mt), observed catch, and percent observed catch by area, harvest sector, gear type, trip target fishery, and vessel length**

Sector	Gear	Trip target	Length	2004			2005			2006			2007		
				Total	Observed	Percent	Total	Observed	Percent	Total	Observed	Percent	Total	Observed	Percent
CP	NPT	Pacific cod	>=60 and <125	–	–	0%	565	411	73%	–	–	0%	0	166	0%
			>=125	–	–	100%	0	0	0%	0	0	0%	0	0	0%
		Rockfish	>=60 and <125	–	–	17%	0	0	0%	–	–	0%	0	4	0%
			>=125	6,654	6,655	100%	7,973	7,353	92%	7,716	7,716	100%	4,656	4,656	100%
		Flathead sole	>=60 and <125	–	–	104%	–	–	77%	–	–	70%	–	–	104%
		Arrowtooth	>=60 and <125	0	0	0%	2,735	2,150	79%	3,878	1,500	39%	518	0	0%
			>=125	–	–	100%	–	–	100%	3,785	3,785	100%	4,498	4,498	100%
		Rex sole	>=60 and <125	2,674	0	0%	2,776	1,133	41%	6,883	1,691	25%	–	–	36%
			>=125	–	–	100%	–	–	100%	0	0	0%	0	0	0%
	POT	Pacific cod	>=60 and <125	0	0	0%	0	0	0%	0	0	0%	–	–	0%
S	NPT	Pacific cod	<60	–	–	0%	–	–	0%	–	–	0%	–	–	0%
			>=60 and <125	12,443	3,716	30%	7,376	2,185	30%	4,861	1,152	24%	8,377	2,216	26%
		Arrowtooth	<60	0	0	0%	0	0	0%	0	0	0%	–	–	0%
			>=60 and <125	7,517	1,476	20%	8,519	2,212	26%	12,543	2,993	24%	12,818	2,574	20%
		Shallow water flatfish	<60	0	0	0%	11	0	0%	0	0	0%	547	0	0%
			>=60 and <125	3,339	1,127	34%	6,835	1,300	19%	10,432	1,393	13%	13,382	3,441	26%
		Rockfish	<60	120	0	0%	0	0	0%	0	0	0%	134	0	0%
			>=60 and <125	12,292	3,864	31%	9,477	2,989	32%	7,197	1,913	27%	5,758	3,522	61%
	POT	Pacific cod	<60	2,426	0	0%	3,233	0	0%	3,778	0	0%	4,296	0	0%
			>=60 and <125	2,475	687	28%	4,920	1,298	26%	4,369	981	22%	4,090	969	24%
			>=125	0	0	0%	0	0	0%	–	–	0%	0	0	0%
	PTR	Rockfish	>=60 and <125	66	217	327%	535	636	119%	1,999	1,211	61%	2,990	4,029	135%
		Pollock, bottom and midwater	<60	–	–	0%	1,677	0	0%	–	–	0%	–	–	0%
			>=60 and <125	36,431	13,520	37%	47,273	14,845	31%	44,371	14,187	32%	33,530	11,150	33%

Notes for Table 2 and Table 3 follow Table 3.

Source: http://www.fakr.noaa.gov/sustainablefisheries/inseason/percent_observed.pdf

Table 3 **Western Gulf of Alaska total catch (mt), observed catch, and percent observed catch by area, harvest sector, gear type, trip target fishery, and vessel length**

Source: http://www.fakr.noaa.gov/sustainablefisheries/inseason/percent_observed.pdf

Sector	Gear	Trip Target	Length	2004			2005			2006			2007		
				Total	Observed	Percent	Total	Observed	Percent	Total	Observed	Percent	Total	Observed	Percent
CP/M	HAL	Pacific cod	<60	0	0	0%	0	0	1%	0	0	0%	–	–	0%
			>=60 and <125	2,394	509	21%	–	–	7%	2,199	1,587	72%	2,895	1,989	69%
			>=125	925	925	100%	292	292	100%	956	956	100%	442	444	100%
		Sablefish	>=60 and <125	572	211	37%	618	254	41%	540	288	53%	758	447	59%
			>=125	359	359	100%	415	411	99%	344	341	99%	191	172	90%
	NPT	Pacific cod	>=60 and <125	635	0	0%	–	–	625%	–	–	0%	–	–	39%
			>=125	–	–	100%	0	0	0%	0	0	0%	0	0	0%
		SW Flatfish	>=60 and <125	–	–	0%	–	–	21%	–	–	57%	–	–	0%
		Rockfish	>=60 and <125	–	–	117%	–	–	0%	–	–	189%	0	0	0%
			>=125	5,291	5,298	100%	3,459	3,351	97%	6,625	6,623	100%	8,274	8,272	100%
		Flathead sole	>=60 and <125	1,047	114	11%	1,803	24	1%	–	–	35%	1,040	352	34%
			>=125	–	–	100%	–	–	100%	0	0	0%	0	0	0%
		Arrowtooth	>=60 and <125	–	–	1989%	–	–	2134%	–	–	71%	–	–	94%
			>=125	901	901	100%	1,220	1,220	100%	953	953	100%	1,771	1,771	100%
		Rex sole	>=60 and <125	–	–	5%	–	–	12%	–	–	21%	–	–	56%
			>=125	–	–	100%	0	0	0%	0	0	0%	–	–	100%
	POT	Pacific cod	<60	0	0	0%	0	0	0%	0	0	0%	–	–	0%
			>=60 and <125	–	–	0%	–	–	34%	–	–	0%	–	–	18%
S	HAL	Pacific cod	<60	–	–	0%	242	0	0%	78	0	0%	327	0	0%
			>=60 and <125	4	0	0%	–	–	0%	0	0	0%	–	–	0%
		Sablefish	<60	837	0	0%	728	0	0%	1,043	0	0%	982	0	0%
			>=60 and <125	529	41	8%	380	122	32%	461	141	31%	471	56	12%
			>=125	0	0	0%	–	–	0%	0	0	0%	0	0	0%
	NPT	Pacific cod	<60	1,464	0	0%	3,554	0	0%	5,114	0	0%	–	–	0%
			>=60 and <125	183	0	0%	783	392	50%	–	–	25%	–	–	77%
	POT	Pacific cod	<60	4,823	0	0%	1,962	0	0%	1,913	0	0%	2,441	0	0%
			>=60 and <125	5,016	1,138	23%	4,428	965	22%	3,882	683	18%	2,205	378	17%
			>=125	–	–	64%	–	–	0%	–	–	0%	–	–	0%
	PTR	Pollock, bottom and midwater	<60	–	–	0%	–	–	0%	13,391	0	0%	13,029	0	0%
			>=60 and <125	7,611	2,938	39%	10,988	5,613	51%	11,604	4,858	42%	5,258	1,662	32%

Notes for Table 2 and Table 3:

These tables do not include data from shoreside processors using paper weekly production reports because the data is at the processor level. The vessel length associated with the catcher vessels delivering to the shoreside processor is not available. This includes 5,717 mt of total groundfish catch in the GOA, consisting of 19 processors in 2004, 11 processors in 2005, and 8 processors in 2006 in the GOA.

1. Values where total and observed columns are blank (-) indicate confidential data. Confidential data have been defined as <3 vessels and processors for that given year, area, sector, gear type, target fishery, and vessel length.
2. Total catch data are from the catch accounting system, and the observer data are from the observer database in March 2008.
3. Harvest sector: S=shoreside; CP/M=catcher processor or mothership
4. Gear type: HAL=hook-and-line; JIG=jig (not included in this table); NPT=non-pelagic trawl, POT=pot; PTR=pelagic trawl
5. Vessel length: <60=vessels less than 60 ft length overall (LOA); >=60 and <125=vessels greater than or equal to 60 ft and less than 125 ft LOA; >=125=vessels greater than or equal to 125 ft LOA
6. Year= target fishery year
7. Weight is rounded to the nearest mt.
8. Percent= (mt of observed catch/mt of total groundfish catch in catch accounting system)*100
9. Not included in the GOA are trip target fisheries per gear type: HAL= pollock, deepwater flatfish, rockfish, other species, arrowtooth (2,406 mt shoreside, 404 mt CP/M); NPT= pollock, deepwater flatfish, shallow water flatfish, rockfish, flathead sole, other species, sablefish (21,367 mt shoreside, 1,633 mt CP/M); POT= pollock, other species (18 mt shoreside); PTR= Pacific cod, shallow water flatfish, flathead sole, other species, arrowtooth, sablefish (2,220 mt shoreside, 566 mt CP/M)
10. For CPs and motherships groundfish catch estimates, the catch accounting system uses weekly production reports for vessels>=60 and <125 and observer data for vessels >=125 except for pot gear uses weekly production reports for vessels >=60.
11. In some cases, the observed data are higher than the total catch for a given area, sector, gear type, target fishery, vessel length. There are several reasons that this occurs:
    a. In 2004-2006, four CPs >=125 ft. had haul data considered to be invalid by the Observer Program. These data were replaced with weekly production reports in the catch accounting system, but are still used as the observed total.
    b. For catcher/processors and motherships >=60 and <125, there can be a mismatch between the trip target that is assigned from the observed data and the trip target that is assigned based on weekly production report data. This occurs when a vessel targets more than one target species during a week.
    c. For the shoreside sector, the total catch is based on fish tickets, which could be different from the observer data.
    d. The two databases include separate sources of information. The catch accounting system partially uses weekly production reports, landing reports, and observer data. Production reports are focused on different goals from the observer data (production vs. total catch), uses a different method to determine catch and targets, and in the cases of 30% observer coverage include dis-coordinated time frames of estimates, especially at the target level (i.e. observer data may not cover the entire week that a production report is based on).
12. A high level of variability in the percent observed catch for a given target fishery may be explained by the level of coverage that vessels had prior to entering a different FMP area. Observer coverage is by quarter and by fishery category, not by FMP area. A 30% vessel may have enough observer coverage in one FMP area to meet the requirements for their fishing in another FMP area. A high level of variability in percent observed catch also may be attributed to a variable number of vessels that participate in certain GOA fisheries each year.
13. This is NMFS' approach to the OAC data request, as of March 26, 2008.

2.3 Spatial analysis of bycatch patterns

In order to map the location of Chinook salmon and *C. bairdi* crab bycatch in GOA fisheries, the analyst used data from observed vessels only. Only observed hauls are associated with geographical coordinates. The observer program database extrapolates species composition of individual basket samples from each haul to the haul level, and the spatial analysis uses the haul-level extrapolated bycatch numbers of Chinook and *C. bairdi*, as well as the official ton weight of the haul, to calculate bycatch rates. The spatial

analysis uses data from 2003-2007, queried from the observer database by Jeannie Heltzel, NPFMC, in October 2008. Specific locations of salmon and crab bycatch were input into a GIS to produce charts of catch locations. Information on crab survey abundance estimates were obtained from published Alaska Department of Fish and Game (ADFG) reports, as well as data provided by ADFG staff.

3 Review of Existing Closures

There are already seasonal and permanent area closures that have been implemented for the GOA groundfish fisheries, many of which were instituted to reduce bycatch or interactions with Steller sea lions. It is important to consider the development of new spatial controls to reduce bycatch within the context of existing time and area closures. The various State and Federal closures affecting the GOA groundfish fisheries are described below, along with their intended purpose. The year the closure was implemented is noted in parentheses. Figure 13 (page A at the end of the document) maps the existing closures in the entire GOA management area; Figure 14 and Figure 15 (page B) pinpoint the western and central regulatory areas, respectively, which are the focus of this discussion paper.

Kodiak red king crab closures: Type I and Type II (1993). Trawl closure areas, designed to protect Kodiak red king crab because of the poor condition of the king crab resource off Kodiak and because trawl bycatch and mortality rates are highest during the spring months when king crab migrate inshore for reproduction. The molting period off Kodiak begins around February 15 and ends by June 15. Type I areas have very high king crab concentrations and, to promote rebuilding of the crab stocks, are closed all year to all trawling except with pelagic gear. Type II areas have lower crab concentrations and are only closed to non-pelagic gear from February 15 through June 15. In a given year, there may also be Type III areas, which are closed only during specified 'recruitment events', and are otherwise opened year-round.

Steller Sea Lion (SSL) 3-nautical mile (nm) no transit zone (2003). Groundfish fishing closures related to SSL conservation establish 3-nm no-transit zones surrounding rookeries to protect endangered Steller sea lions.

SSL no-trawl zones for pollock (2003). Groundfish fishing closures related to SSL conservation establish 10-nm fishing closures surrounding rookeries to protect endangered Steller sea lions.

Scallop closures (1995). Year-round closure to scallop dredging to reduce high bycatch of other species (i.e., crabs) and avoid and protect biologically critical areas such as nursery areas for groundfish and shellfish.

Prince William Sound rookeries no fishing zone (2003). Groundfish fishing closures related to SSL conservation include two rookeries in the PWS area, Seal Rocks (60° 09.78' N. lat., 146° 50.30' W. long.) and Wooded Island (Fish Island) (59° 52.90' N. lat., 147° 20.65' W. long.). Directed commercial fishing for groundfish is closed to all vessels within 3 nautical miles of each of these rookeries.

Cook Inlet bottom trawl closure (2001). Prohibits non-pelagic trawling in Cook Inlet to control crab bycatch mortality and protect crab habitat in an areas with depressed king and Tanner crab stocks.

State Water no bottom trawling (2000). State managed area provides year-round protection from all bottom trawl gear. Closes all state waters (0–3 nm) to commercial bottom trawling to protect nearshore habitats and species.

Southeast Alaska no trawl closure (1998). Year-round trawl closure E. of 140° initiated as part the license limitation program.

4 Chinook Salmon Bycatch

Pacific salmon, including Chinook, chum (*O. keta*), coho *(O. kisutch*), sockeye (*O. nerka*), and pink (*O. gorbuscha*) are taken incidentally in the groundfish fisheries within the Gulf of Alaska. Salmon bycatch is currently grouped as Chinook salmon or 'other' salmon, which consists of the other four species combined. Bycatch of Chinook salmon in the last five years (average of 25,312 salmon, 2003–2007) is higher than the time series average (average of 21,606 salmon, 1990–2007, Table 4). For the purpose of this discussion paper, it is assumed that salmon caught as bycatch has a 100% mortality rate in the groundfish fisheries.

The following sections provide updated information on Chinook salmon bycatch in the GOA groundfish fisheries. A historical report on salmon bycatch in groundfish fisheries off Alaska as it pertains to the GOA is provided in Witherell et al. (2002).

Table 4 Bycatch of Pacific salmon in Gulf of Alaska groundfish trawl fisheries, by species, 1990-2008

Year	Chinook	'Other' salmon[a]	Chum	Coho	Sockeye	Pink
1990	16,913		2,541	1,482	85	64
1991	38,894		13,713	1,129	51	57
1992	20,462		17,727	86	33	0
1993	24,465		55,268	306	15	799
1994	13,973		40,033	46	103	331
1995	14,647		64,067	668	41	16
1996	15,761		3,969	194	2	11
1997	15,119		3,349	41	7	23
1998	16,941	13,539				
1999	30,600	7,529				
2000	26,705	10,996				
2001	14,946	5,995				
2002	12,921	3,218				
2003	15,358	10,362				
2004	21,447	5,816				
2005	31,207	6,694				
2006	18,816	4,273				
2007	39,733	3,487				
Average 1990–2007	**21,606**	15,454[a]				
Average 2003–2007	**25,312**	4,818				
2008 (through 10/25/08)	16,493	2,088				

[a] Combines chum, coho, sockeye, and pink salmon.

[b] Average combines chum, coho, sockeye, and pink salmon bycatch for 1990-1997.

Source: NMFS catch reports (http://www.fakr.noaa.gov/sustainablefisheries/catchstats.htm) for 1990-2002 (all species) and 2003-2008 (non-Chinook species); NMFS catch accounting PSC data for 2003-2007 (Chinook), October 2008.

4.1 Bycatch by area, gear type, and target fishery

In the GOA, Chinook salmon bycatch primarily occurs in the western and central regulatory areas, and corresponds to the locations of the trawl fisheries. Table 5 illustrates bycatch for 2003-2007, and 2008-to-date, across regulatory and reporting areas. In all years except 2008 to date, salmon bycatch in the eastern regulatory area is less than 2% of total Chinook bycatch. Since 1998, the eastern GOA (east of 140°W

longitude) has been closed to all trawling, with the implementation of Amendment 58 to the GOA groundfish FMP. Chinook bycatch in the western regulatory area as a proportion of total GOA Chinook bycatch varies between a tenth and a third, by year, but averages to approximately 20%.

Table 5 Chinook salmon bycatch by reporting area, 2003-2008, in Gulf of Alaska groundfish fisheries

Regulatory Area		2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Western	610	2,859	6,162	7,567	4,880	3,671	2,268	5,028
Central	620	3,876	5,320	6,976	5,678	28,941	7,405	10,158
	630	8,437	9,957	16,180	8,168	7,084	6,115	9,965
Eastern	640	186	36	483	89	71	705	173
	650	0	4	0	0	2	0	1
Grand Total		15,358	21,478	31,207	18,816	39,768	16,493	25,325

Source: NMFS catch accounting PSC data, October 2008.

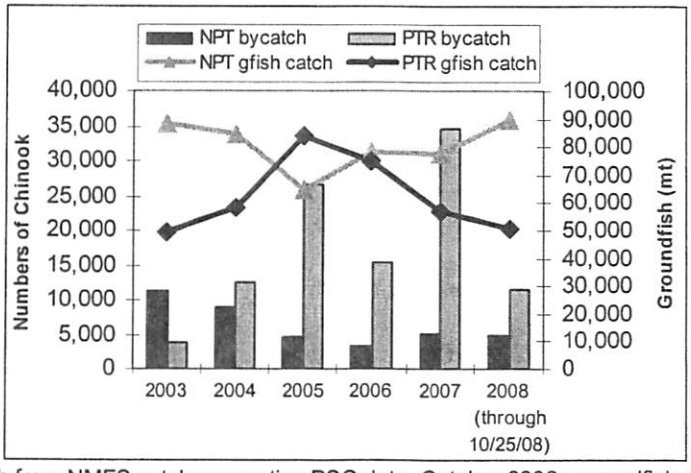
Table 6 identifies Chinook bycatch for 2003-2008, by gear type. Pelagic and non-pelagic trawling are almost entirely responsible for Chinook salmon bycatch. In 2005-2007, pelagic trawl gear accounted for over 80% of Chinook bycatch, The relationship between groundfish catch and pelagic and non-pelagic trawl Chinook bycatch was consistent from 2003-2005 (Figure 1), however since then bycatch rates in the pelagic trawl fishery have been highly variable and have not paralleled groundfish catch.

Table 6 Chinook salmon bycatch by gear type, in Gulf of Alaska groundfish fisheries, 2003-2008

Gear type	2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Hook and line	0	31	0	0	35	0	13
Non-pelagic trawl	11,388	9,006	4,593	3,434	5,071	4,975	6,698
Pelagic trawl	3,970	12,440	26,614	15,382	34,663	11,518	18,614
Pot	0	0	0	0	0	0	0
Grand Total	15,358	21,478	31,207	18,816	39,768	16,493	25,325

Source: NMFS catch accounting PSC data, October 2008.

Figure 1 Chinook bycatch in GOA Groundfish Trawl Fisheries



Source: Chinook bycatch from NMFS catch accounting PSC data, October 2008; groundfish catch from NMFS catch accounting data, October 2008. Represents total GOA groundfish catch excluding State waters catch.

Chinook bycatch with non-pelagic trawl gear is distributed among several target fisheries, while pelagic trawl bycatch occurs predominantly in the pollock target fishery (Table 7). In 2005–2007, the flatfish non-pelagic trawl target fisheries accounted for approximately 6-10% of Chinook bycatch in the GOA, although for 2008 through October 25th, that percentage has increased to 17%. In 2003 and 2004, the flatfish target fishery accounted for 45% and 31% of Chinook bycatch, respectively. Averaged over 2003-2007, bycatch in the pollock pelagic trawl target fishery represents 73.2% of total GOA Chinook bycatch, or 18,533 fish annually. Table 8 illustrates the distribution of bycatch in the pollock pelagic fishery among reporting areas. While bycatch in the western GOA is consistently lower than it is in the central regulatory area, the proportional bycatch by area within all years 2003-2008 is highly variable. 2007 was the year of highest bycatch in the Chignik area (620), with 28,034 Chinook, while in the Kodiak area (630), 2005 was the highest bycatch year with 13,370 Chinook.

Table 7 Chinook salmon bycatch by target fishery, in Gulf of Alaska groundfish fisheries, 2003-2008

Gear type	Target fishery	2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Pelagic trawl	Pollock	3,939	12,440	26,551	15,376	34,357	10,757	18,533
	Rockfish	2	*	63	0	304	761	92
Non-pelagic trawl	Arrowtooth Flounder	3,348	359	1,798	408	1,504	2,608	1,484
	Flathead Sole	598	5,289 [5]	16	56	0	0	1,192
	Pacific Cod	3,167	908	41	882	634	640	1,126
	Pollock	423	571	1,296	380	50	70	544
	Rex Sole	2,819	498	982	1,444	714	0	1,291
	Rockfish	917	885	397	263	1,733	1,465	839
	Shallow Water Flatfish	116	498	63	0	434	192	222

Source: NMFS catch accounting PSC data, October 2008.

Table 8 Chinook salmon bycatch in the pelagic pollock trawl fishery, by reporting area, 2003-2008

Reporting area		2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Western GOA	610	738	2,013	5,951	4,529	3,364	2,035	3,105
Central GOA	620	1,121	4,886	6,747	4,843	28,034	6,892	8,754
	630	2,013	5,513	13,370	5,915	2,925	1,448	5,197

Source: NMFS catch accounting PSC data, October 2008.

4.2 Timing of Chinook bycatch

The timing of salmon bycatch follows a predictable pattern in most years. Chinook salmon are caught in high quantities regularly from the start of the trawl fisheries on January 20 through early April, and again during September/October in the pollock B season fishery (Table 9). Figure 2 illustrates the difference in seasonal bycatch patterns between the pelagic and non-pelagic trawl fisheries with respect to Chinook bycatch. For the pelagic fishery, Chinook bycatch pulses in correlation with the seasons of the pollock target fishery. For the non-pelagic trawl fisheries, Chinook bycatch is caught consistently throughout the year, although in higher quantities in the spring months. Because of the varied target fisheries in which

[5] Since this discussion paper was last revised, NMFS reloaded catcher vessel data from 2003-2008 into the Catch Accounting system in order to identify catcher vessels delivering to motherships. This resulted in the recalculation of some PSC estimates. As a result, Chinook bycatch in the 2004 flathead sole fishery increased from 1,446 to 5,289 Chinook. PSC associated with other target fisheries was not substantially affected. NMFS is currently reviewing these PSC estimates and may revise them at a future date. The data are current as of October 2008.

the non-pelagic trawl vessels participate, Chinook bycatch does not correlate well to groundfish catch by that sector as a whole. The spike in non-pelagic trawl groundfish catch in July is due to participation in the rockfish fisheries, which incur very low Chinook bycatch.

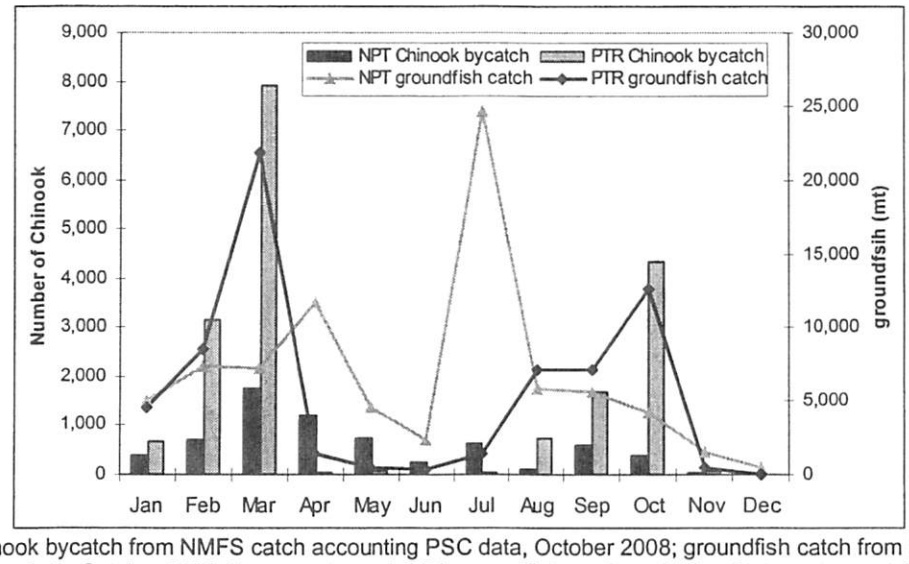
Table 9 Chinook salmon bycatch by month, 2003-2008, in Gulf of Alaska groundfish fisheries

Month	2003	2004	2005	2006	2007	2008 (through 10/25/08)
January	1,988	285	924	1,952	169	314
February	1,524	3,765	10,400	1,816	1,664	710
March	1,005	7,019	7,269	4,799	28,226	6,931
April	3,286	1,042	382	1,143	203	3,117
May	2,372	34	60	10	1,402	1,225
June	0	38	7	28	1,089	363
July	929	1,034	460	235	654	702
August	1,203	1,484	385	811	253	129
September	470	2,759	1,829	4,098	2,179	370
October	2,580	4,018	9,490	3,786	3,859	2,632
November	*	0	*	138	19	
December		*	*		50	

* = data is confidential.

Source: NMFS catch accounting PSC data, October 2008.

Figure 2 Average Chinook bycatch and groundfish catch by vessels using pelagic and non-pelagic trawl gear, by month, 2003-3007



Source: Chinook bycatch from NMFS catch accounting PSC data, October 2008; groundfish catch from NMFS catch accounting data, October 2008. Represents total GOA groundfish catch excluding State waters catch.

4.3 Location of Chinook bycatch

The data presented in the sections above has all been based on the NMFS catch accounting prohibited species catch data, which takes bycatch reports from observed fishing trips and applies these bycatch rates to all groundfish catch within each target, gear type, and reporting area. In order to examine the spatial distribution of bycatch at a finer scale than that of the reporting area, it is only possible to use the bycatch

data collected on observed trips, as only observed hauls are associated with geographical coordinates. Section 2.1 describes the proportion of fishing trips which are observed in the GOA. Consequently, it should be remembered, while interpreting the following series of maps, that the data represents only a small proportion of the GOA fishing effort.

All of the following maps use observer data that has been extrapolated to the haul level[6]. Figure 17 and Figure 19, on pages D and F at the end of this document, map the average observed number of Chinook for 2003-2007, in fisheries using pelagic and non-pelagic trawl gear, respectively. Figure 18 and Figure 20 (pages E and G) illustrate the average bycatch rate, mapping the number of Chinook per metric ton of groundfish, for the same years and the same fisheries.

4.4 Factors affecting bycatch: hatchery releases of Chinook salmon

The United States and Canada account for the highest numbers of hatchery releases of juvenile Chinook salmon, although a limited number are released from Russia. The North Pacific Anadromous Fish Commission compiles reports that summarize these hatchery releases (Table 10). Hatchery releases in each region have decreased in recent years.

The United States has the highest number of annual releases (81% of total in 2006), followed by Canada (18%). Of the US releases, the highest numbers are coming from the State of Washington (61% in 2006), followed by California (16% in 2006), and then Oregon (11% in 2007). Hatcheries in Alaska are located in southcentral and southeast Alaska. Since 2004, the number of hatcheries has ranged from 33 (2004–2005) to 31 (2006), with the majority of hatcheries (18–22) located in southeast Alaska, while 11 hatcheries are in Cook Inlet and 2 in Kodiak (Eggers, 2005a; 2006; Josephson, 2007).

The highest numbers of Canadian releases of Chinook in 2006 occurred in the West Coast Straits of Georgia (20 million fish) followed by Vancouver Island area (12.4 million fish) the Lower Fraser River (3.3 million fish) (Cook and Irvine, 2007).

No correlation is discernable between the bycatch of salmon in the GOA and the release from any of these hatchery sites.

Table 10 Hatchery releases of juvenile Chinook salmon, by country, compared to GOA groundfish bycatch, in millions of fish

Year	Russia	Canada	USA	Total	Total GOA groundfish Chinook bycatch
1999	0.6	54.4	208.1	**263.1**	.031
2000	0.5	53.0	209.5	**263.0**	.027
2001	0.5	45.5	212.1	**258.1**	.015
2002	0.3	52.8	222.1	**275.2**	.013
2003	0.7	50.2	210.6	**261.5**	.015
2004	1.17	49.8	173.6	**224.6**	.021
2005	0.84	43.5	184.0	**228.3**	.031
2006	0.78	41.3	181.2	**223.3**	.019
2007					.040

Source: North Pacific Anadromous Fisheries Commission reports: Russia (Anon. 2007; TINRO-centre 2006, 2005); Canada (Cook and Irvine 2007); USA (Josephson 2007; Eggers 2006, 2005a; Bartlett 2005, 2006, 2007).

[6] Observers do not sample the entire haul from a fishing tow, but rather collect one or several basket samples. The number of Chinook collected within the basket sample is extrapolated by the Observer Program to represent the number of Chinook caught in the entire haul. Extrapolating to the haul level allows the data to be better compared across hauls, even though individual sample sizes may differ.

4.5 Impacts of bycatch: river of origin of GOA Chinook

The direct effects of GOA groundfish bycatch of Chinook salmon on the sustainability of salmon populations is difficult to interpret without specific information on the river of origin of each bycaught salmon. No bycatch sampling studies have been conducted in the GOA trawl fisheries to look at the origin of salmon bycatch, although some studies have been undertaken in the Bering Sea pollock trawl fishery. Limited information is available from other studies into the river of origin of salmon species.

The High Seas Salmon Research Program of the University of Washington routinely tags and monitors Pacific salmon species. It should be noted that Coded Wire Tag (CWT) information may not accurately represent the true distribution of hatchery-released salmon. Much of the CWT tagging occurs within the British Columbia hatcheries and thus, most of the tags that are recovered also come from those same hatcheries. CWT tagging does occur in some Alaskan hatcheries, specifically in Cook Inlet, Prince William Sound, other Kenai region hatcheries, as well as in hatcheries in Southeast Alaska (Johnson, 2004).

Chinook salmon tags have been recovered in the area around Kodiak through recovery projects in 1994, 1997, and 1999. The majority of tags recovered from non-Alaska Chinook salmon were from British Columbia, and the study concluded that there was only a low incidental harvest of Cook Inlet Chinook salmon in the Kodiak area (Dinnocenzo and Caldentey 2008).

Other CWT studies have tagged Washington and Oregon salmon, and many of these tagged salmon have been recovered in the GOA (Myers et al. 2004). In 2006, 63 tags were recovered in the eastern Bering Sea and GOA (Celewycz et al. 2006). Of these, 8 CWT Chinook salmon were recovered from the Gulf of Alaska trawl fishery in 2006 and 2007, 8 CWT Chinook salmon were recovered from the Bering Sea-Aleutian Islands trawl fishery in 2006 and 2007, 44 CWT Chinook salmon were recovered from the Pacific hake trawl fishery in the North Pacific Ocean off WA/OR/CA in 2006, and 3 CWT steelhead were recovered from Japanese gillnet research in the central North Pacific Ocean.

Overall, tagging results in the GOA showed the presence of Columbia River Basin Chinook and Oregon Chinook salmon tag recoveries (from 1982–2003). Some CWT recovered by research vessels in this time period also showed the recoveries of coho salmon from the Cook Inlet region and southeast Alaska coho salmon tag recoveries along the southeastern and central GOA (Myers et al 2004).

Additional research on stock discrimination for Chinook salmon is being conducted by evaluating DNA variation, specifically single nucleotide polymorphisms (SNPs). A baseline has been developed that identifies the DNA composition of many BSAI and GOA salmon stocks. Until GOA trawl bycatch samples can be collected and analyzed, however, there is no information to determine what proportion of GOA Chinook bycatch is attributable to rivers of origin in the GOA or elsewhere. The Alaska Fishery Science Center is developing a research plan for sampling Chinook bycatch, but the focus is currently on bycatch in the Bering Sea pollock fishery, and GOA trawl bycatch has not yet been prioritized.

5 Chinook salmon stocks and directed fisheries

The State of Alaska manages commercial, subsistence and sport fishing of salmon in Alaskan rivers and marine waters and assesses the health and viability of individual salmon stocks accordingly. The catches of Chinook salmon in Southeast Alaska are regulated by quotas set under the Pacific Salmon Treaty. In other regions of Alaska, Chinook salmon fisheries are also closely managed to ensure stocks of Chinook salmon are not overharvested. No gillnet fishing for salmon is permitted in Federal waters (3-200 miles), nor commercial fishing for salmon in offshore waters west of Cape Suckling.

Directed commercial Chinook salmon fisheries occur in the Southeast Alaska troll fishery in the GOA, and in the Yukon River, Norton Sound District, Nushagak District, and Copper River. In all other areas, Chinook are taken incidentally, and mainly in the early portions of the sockeye salmon fisheries. Catches in the Southeast Alaska troll fishery have been declining in recent years due to U.S./Canada treaty restrictions and declining abundance of Chinook salmon in British Columbia and the Pacific Northwest. Chinook salmon catches have been moderate to high in most regions over the last 20 years (Eggers 2004).

Forecasts of salmon runs (catch plus escapement) for major salmon fisheries, and projections of statewide commercial harvest are published annually by ADFG. For purposes of evaluating the relative amount of GOA groundfish bycatch as compared to the commercial catch of salmon by area, Table 11 shows the commercial catch of Chinook species by management area between 2003 and 2007. The catches are shown here only as a proxy for an indication of run strength for Chinook stocks across the GOA. Available information on individual stocks and run strengths varies greatly by river and management area. A brief overview of Chinook stocks by area is included in Section 5.1 below. Commercial catches are subject to market constraints and, thus, are not the best estimate of the relative stock size. However, limited information regarding the health of the resource can be obtained by reviewing the commercial catch.

Table 11 Chinook salmon GOA commercial catch, by area, compared to GOA groundfish bycatch, 2003-2007, in 1000s of fish

Year	Southeast	Prince William Sound	Cook Inlet	Kodiak	Chignik	Alaska Peninsula/ Aleutian Islands[a]	Total	Total GOA groundfish Chinook bycatch
2003	431	49	20	19	3	7	**529**	15
2004	497	39	29	29	3	18	**615**	21
2005	462	36	29	14	3	14	**558**	31
2006	379	32	19	20	2	13	**465**	19
2007	359	41	18	17	2	13	**450**	40

[a] Area includes part of the Bering Sea Aleutian Islands

Source: ADFG (http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/catchval/blusheet/07exvesl.php), NMFS catch accounting PSC data, October 2008.

For Chinook stocks, the 2004 catch in the southeast area represented the highest Chinook harvest on record (since statehood) and almost twice the 10-year average (Eggers 2005b). In Prince William Sound, the 2007 harvest was below the projected harvest and the 7th largest since 1985. Cook Inlet harvests were low compared to long term averages as well. For Kodiak, the 2004 harvest was much higher than the previous 10-year average (Eggers 2006), with lower catches in 2007 compared to the long term average.. For Chignik, the 2004 harvest of Chinook was approximately equal to the previous two years' harvests (under the cooperative management plan) and roughly half of the 10- and 20-year averages. South Alaska Peninsula Chinook harvest in 2007 was less than the 10-year average.

5.1 GOA Chinook salmon stocks

This section provides a brief overview of GOA Chinook salmon stocks. More detailed information on escapement and river systems is available and can be added to this section in future.

Southeast Alaska Stocks

Chinook salmon are known to occur in 34 rivers in the Southeast region of Alaska, or draining into the region from British Colombia or Yukon Territory, Canada (known as transboundary rivers). Harvest in Southeast Alaska occurs under the Pacific Salmon Treaty. 11 watersheds have been designated to track spawning escapement, and counts of these 11 stocks are used as indicators of relative salmon abundance as part of a coast-wide Chinook model. The Taku, Stikine, and Chilkat rivers together make up over 75% of the summed escapement goals in the region. Escapement on the Taku River remains low relative to the 1990-1999 average, but escapement to the Stikine River has increased greatly since 1999 (Pahlke 2007).

The Chinook salmon quota for Southeast Alaska, all gears, in 2006, was 329,400. In addition, a harvest sharing agreement with Canada under the treaty allows harvest in the Stikine River; the US allocation in 2006 was 13,350 fish. There was no directed fishery for Chinook salmon on the Taku River in 2006 due to low forecast returns (Nelson et al 2008).

Prince William Sound

The Prince William Sound management area encompasses all coastal waters and inland drainages entering the north central Gulf of Alaska between Cape Suckling and Cape Fairfield. An Sustainable Escapement Goal for Copper River Chinook is established at 24,000 fish, and inriver escapement to the upper Copper River is established for all salmon species combined. In 2005, about half of the Copper River Chinook salmon run was harvested commercially, a third went to spawning escapement, and the reminder was harvested by upriver sport users or personal and subsistence users (Hollowell et al. 2007).

Cook Inlet

The Cook Inlet management area is divided into 2 areas, the Upper Cook Inlet (northern and central districts) and the Lower Cook Inlet. Inseason management of Cook Inlet commercial salmon fisheries is based upon salmon run abundance and timing indicators. Catch data, catch per effort data, test fish data, catch composition data, and escapement information from a variety of sources is used to assess stock strength on an inseason basis. For Chinook salmon, surveys are made to index escapement abundance (Clark et al 2006).

There are three biological escapement goals (Kenai River early and late runs, Deshka River) and 18 sustainable escapement goals in effect for Chinook salmon spawning in Upper Cook Inlet. After experiencing a significant downturn in the early to mid-1990s, Northern District Chinook salmon stocks continue to trend sharply upward and most escapement goals are being met or exceeded. For the years 2000-2004, for the 15 Upper Cook Inlet populations with the most complete escapement observations, 97% of observed escapement exceeded the lower end of the escapement goal range (Clark et al 2006). Late-run Kenai River Chinook salmon runs are estimated by sonar, and have been relatively stable.

The recent 5-year average commercial harvest was used to forecast the harvest of Chinook salmon in 2008 for the Upper Cook Inlet. The commercial harvest estimate for Chinook salmon is 23,000 fish.

There are 3 sustainable escapement goals in effect for Chinook in the Lower Cook Inlet. Chinook salmon is not normally a commercially important species in the Lower Cook Inlet. The 2007 harvest totaled just

under 500 fish, of which virtually all came from the Halibut Cove Subdistrict (Nelson et al 2008). Very little escapement information is available for this area.

Kodiak, Chignik, South Alaska Peninsula

There are three streams that support viable Chinook salmon in the Kodiak management area: Ayakulik River, Karluk River, and Dog Salmon Creek. Commercial harvest occurs during targeted sockeye salmon fisheries. Escapement objectives have been estimated for the Ayakulik and Karluk river systems, and escapement for all three rivers is estimated using fish counting weirs. In 2007, the escapement on the Ayakulik of 6,535 Chinook was within the escapement goal range, but below the previous ten-year average of 14,274 salmon (Dinnocenzo and Caldentey 2008). For the Karluk, 2007 escapement of 1,765 Chinook was below the escapement goal range of 3,600 to 7,300, although in previous years escapements have been within the goal range since 1998. Escapements have averaged 370 fish for Dog Salmon Creek since 1998 (Dinnocenzo and Caldentey 2008).

For the Chignik River, the 2004 Chinook escapement of 7,800 fish was the largest on record and greatly exceeded the escapement goal of 1,300-2,700 fish (Eggers 2006). There are no Chinook spawning streams in the South Alaska Peninsula district.

6 *C. Bairdi* Tanner Crab Bycatch

Several species of crabs may be taken incidentally in GOA groundfish fisheries, however this discussion paper focuses only on *C. bairdi* Tanner crab. The following sections provide updated information on bycatch in the GOA groundfish fisheries.

6.1 Mortality Rates

There are several sources that have calculated mortality rates for crab in various gear types and target fisheries, and many of them differ. The various studies are summarized in Table 12. At their May 2009 meeting, the Council's Crab Plan Team will be discussing the issue of appropriate mortality rates in both directed crab fisheries and other fisheries where crab is caught incidentally, and may be able to provide further guidance after that time. In the meantime, the data presented in the sections below do not account for handling mortality.

Table 12 Various calculations of mortality rates for harvested crab

Study		Directed crab fisheries			Groundfish fisheries			Scallop fishery
		King crab	*C. opilio* Tanner crab	*C.bairdi* Tanner crab				
		Pot	Pot	Pot	Pot	Trawl	Longline	Dredge
Council re-evaluation of overfishing levels	NPFMC et al 2007	20%	50%	20%				
Council's annual Crab SAFE report	NPFMC 2007	8%	24%	20%	20%	80%	20%	40%
Council's groundfish amendment	NPFMC 1995				8%	80%	37%	40%
NRC study	NRC 1990					12-82%		
1998 snow crab study	Warrenchuk and Shirley 2002			22.2%[a]				

[a] Estimate considered to be conservative because the estimated effects of wind and cold exposure as well as handling injuries were considered separately and not synergistically.

6.2 Bycatch in Federal groundfish fisheries, by area, gear type, and target fishery

In the GOA, *C. bairdi* bycatch primarily occurs in the western and central regulatory areas, and corresponds to the locations of the trawl and pot fisheries. Table 13 illustrates bycatch for 2003-2007, and 2008-to-date, across regulatory and reporting areas. Crab bycatch in the eastern regulatory area is negligable. Crab bycatch in the western regulatory area as a proportion of total GOA *C. bairdi* bycatch varies between 3% and 26% of the total, by year, and averages to approximately 10% over 2003-2007.

Table 13 *C. bairdi* bycatch by reporting area, 2003-2008, in GOA Federal[7] groundfish fisheries

Reporting area		2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Western	610	7,458	22,479	45,808	10,431	32,458	28,010	23,727
Central	620	24,033	5,893	9,578	67,316	57,452	43,746	32,854
	630	117,365	63,131	116,112	254,472	219,945	150,244	154,205
Eastern	640	1	0	33	28	17	64	16
	650	1	27	0	22	84	0	27
Grand Total		148,856	91,530	171,532	332,268	309,956	222,064	210,829

Source: NMFS catch accounting PSC data, October 2008. Excludes PSC attributed to the State Pacific cod fishery.

Table 14 identifies *C. bairdi* bycatch for 2003-2008, by gear type. Non-pelagic trawling and pot gear are almost entirely responsible for *C. bairdi* bycatch. In 2003, 2004, and 2006, non-pelagic trawl gear accounted for over 90% of *C. bairdi* bycatch, however since 2007, pot bycatch of *C. bairdi* crab has increased significantly. It should be remembered, however, that the relative observer coverage in these fisheries is notably limited, particularly in the Pacific cod pot fishery. Additionally, the relative impact of bycatch on the mortality of crab likely differs by gear type, although studies differ as to the degree. Section 6.1 provides information about the mortality rates of crab by gear type.

Table 14 *C. bairdi* bycatch by gear type, in GOA Federal groundfish fisheries, 2003-2008

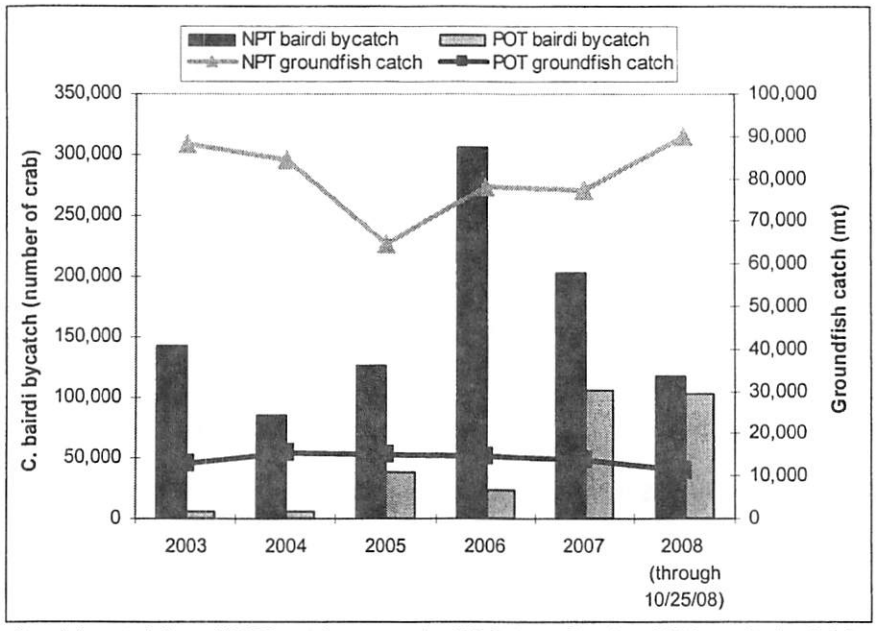
Gear type	2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Hook and line	21	28	1,770	596	272	1,638	538
Non-pelagic trawl	142,206	84,885	126,285	306,592	202,547	117,103	172,503
Pot	6,520	5,950	43,341	24,672	105,583	103,255	37,213
Pelagic trawl	110	667	136	407	1,554	67	575
Grand Total	148,856	91,530	171,532	332,268	309,956	222,064	210,829

Source: NMFS catch accounting PSC data, October 2008. Excludes PSC attributed to the State Pacific cod fishery.

Catch of groundfish by pot gear has remained relatively consistent throughout the last five years (Figure 3). In contrast, non-pelagic trawl bycatch has decreased somewhat since the high of approximately 300,000 crab in 2006, while groundfish catch has increased. Table 15 provides a time series of *C. bairdi* bycatch in groundfish trawl fisheries since 1993. Bycatch of *C. bairdi* Tanner crabs in the last 5 years (167,145 crabs per year average, 2003–2007) is higher than the average for the time series from 1993–2003 (108,540 crabs).

[7] Prohibited species catch (PSC), including catch of *C. bairdi*, is extrapolated to all catch in the GOA groundfish fleet using specific catch estimation procedures based on observed bycatch rates (see further explanation in Section 2.1). The observed bycatch rate is also applied to Pacific cod catch in the State managed fisheries that base their guideline harvest level on the Federal Pacific cod acceptable biological catch level (ABC). In order to provide the Council with an estimation of only the PSC taken in Federal fisheries, crab bycatch in the State waters pot fisheries was identified based on the date and location of catch. A discussion of the State waters Pacific cod fishery bycatch is presented separately in Section 6.5.

Figure 3 **Annual bycatch of C. bairdi Tanner crab and groundfish catch, by Federal trawl and pot fishery sectors, 2003-2008**



Source: *C. bairdi* crab bycatch from NMFS catch accounting PSC data, October 2008; excludes PSC attributed to the State Pacific cod fishery. Groundfish catch from NMFS catch accounting data, October 2008. Represents total GOA groundfish catch excluding State waters catch.

Table 15 ***C. bairdi* crab bycatch in GOA groundfish trawl fisheries, 1993-2007**

Year	*C. bairdi* Tanner		Year	*C. bairdi* Tanner
1993	55,304		2000	48,716
1994	34,056		2001	125,882
1995	47,645		2002	89,433
1996	120,796		2003	142,488
1997	134,782		2004	62,277
1998	105,817		2005	126,905
1999	29,947		2006	306,767
			2007	197,286
Average 1993-2007	**108,540**			
Average 2003-2007	**167,145**			

Data has been screened for confidentiality.

Source: M. Furuness, J. Keaton, NOAA Fisheries, 1993-2002; NMFS catch accounting PSC data for 2003-2007, October 2008.

The highest numbers of Tanner crab taken as bycatch occur primarily in the non-pelagic trawl fisheries (specifically the flatfish target fisheries, and sometimes Pacific cod and pollock targets) and in the pot fishery for Pacific cod (Table 16). Trawl flatfish fisheries represented approximately 90% of *C. bairdi* bycatch in 2003-2004, but has decreased in proportion since then to only 44% in 2008 to date. The pollock non-pelagic trawl fishery accounted for 35% of *C bairdi* bycatch in 1006, but only 6% in 2007, and negligible amounts in other years. Bycatch attributable to the trawl Pacific cod fishery has increased in 2007 and 2008, representing approximately 5% and 8% respectively, in those years. The Pacific cod pot fishery accounted for 25%, 34%, and 47% of GOA bycatch in 2005, 2007, and 2008, respectively, but only 4-7% in other years.

Table 16 Bycatch of *C. bairdi* Tanner crabs in Gulf of Alaska Federal groundfish fisheries, by gear type and target fishery, 2003-2008.

Gear type	Target Fishery	2003	2004	2005	2006	2007	2008 (through 10/25/08)	Average 2003-2007
Non-pelagic trawl	Arrowtooth Flounder	29,159	33,512	68,936	88,425	43,416	27,485	52,690
	Flathead Sole	17,534	30,410	43,956	25,884	254	6,776	23,608
	Pacific Cod	2,227	1,161	1,314	742	15,231	18,364	4,135
	Pollock	1	555	0	83,599	19,346	244	20,700
	Rex Sole	33,932	9,030	4,461	73,528	45,274	49,207	33,245
	Rockfish	178	1,517	1,445	959	152	62	850
	Shallow Water Flatfish	59,153	8,700	5,984	33,455	78,706	14,776	37,200
Pot	Pacific Cod	6,520	5,950	43,341	24,672	105,583	103,255	37,213

* = data is confidential.

Source: NMFS catch accounting PSC database, October 2008. Excludes PSC attributed to State Pacific cod fishery.

6.3 Timing of bycatch in Federal groundfish fisheries

Bycatch amounts of *C. bairdi* Tanner crab taken in groundfish fisheries fluctuate temporally in direct response to groundfish catches (Table 17). Trawl Pacific cod and flatfish are managed on a quarterly basis, and the trawl fishery beginning on January 20th each year. The pot Pacific cod fishery has two seasons, and any catch in the Pacific cod target fishery from March to August has been attributed to the State managed Pacific cod fishery (see Section 6.5; Figure 4). In the trawl fisheries, average bycatch of Tanner crabs from 2003 - 2007 (in numbers of crabs) increased significantly in mid-March and April due to bycatch in the combined flatfish fisheries, and high bycatch was largely associated with the flatfish fisheries (Figure 4). If the spring months are indeed a time of high bycatch for Tanner crab, the Type II Red king crab closure in place in southeastern Kodiak (Section 3), which is in effect from February 15 to June 15, is likely to be effective at reducing Tanner crab bycatch in that area.

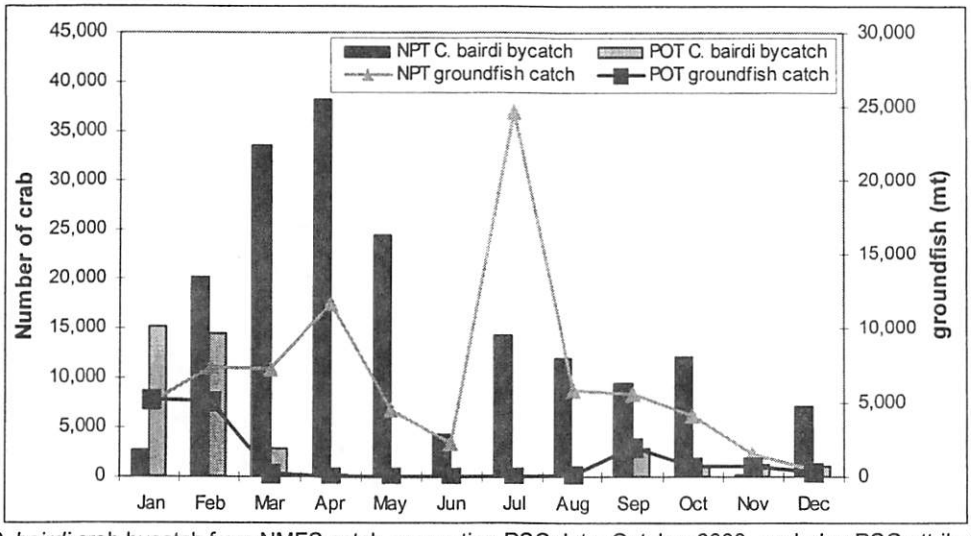
Table 17 *C. bairdi* crab bycatch by month, 2003-2008, in GOA Federal groundfish fisheries

Month	2003	2004	2005	2006	2007	2008	Average 2003-2007
January	4,315	1,999	31,788	9,903	43,411	59,974	18,283
February	9,930	7,519	19,878	66,206	69,675	64,346	34,642
March	19,281	34,643	39,790	71,340	12,482	8,969	35,507
April	22,715	24,492	47,696	64,496	32,177	31,165	38,315
May	35,929	1,615	11,553	21,640	51,343	2,491	24,416
June	10,298	1,893	1,093	7,707	8	54	4,200
July	6,097	16,698	8,518	22,765	17,499	35,653	14,316
August	9,346	354	481	36,878	12,736	18,546	11,959
September	6,300	1,491	5,497	19,495	29,198	200	12,396
October	24,645	725	1,839	10,569	28,990	666	13,354
November	*	78	2,841	494	1,895		1,061
December		24	559	776	10,542		2,975

* = data is confidential.

Source: NMFS catch accounting PSC data, October 2008. Excludes PSC attributed to State Pacific cod fishery.

Figure 4 **Average bycatch of C. bairdi Tanner crab and total groundfish catch by month, for non-pelagic trawl and pot sectors, in Federal fisheries, 2003-2007**



Source: *C. bairdi* crab bycatch from NMFS catch accounting PSC data, October 2008; excludes PSC attributed to the State Pacific cod fishery. Groundfish catch from NMFS catch accounting data, October 2008. Represents total GOA groundfish catch excluding State waters catch.

6.4 Location of *C. bairdi* bycatch

The data presented in the sections above has all been based on the NMFS catch accounting prohibited species catch data, which takes bycatch reports from observed fishing trips and extrapolates them to arrive at GOA-wide totals for recorded Chinook bycatch. In order to examine the spatial distribution of bycatch at a finer scale than that of the reporting area, it is only possible to use the bycatch data collected on observed trips, as only observed hauls are associated with geographical coordinates. Section 2 describes the proportion of fishing trips which are observed in the GOA. Consequently, it should be remembered, while interpreting the following series of maps, that the data represents only a small proportion of the GOA fishing effort.

All of the following maps use observer data that has been extrapolated to the haul level[8]. Figure 21 and Figure 24 Observed *C. bairdi* Tanner crab bycatch in the Federal pot fishery, 2007 only

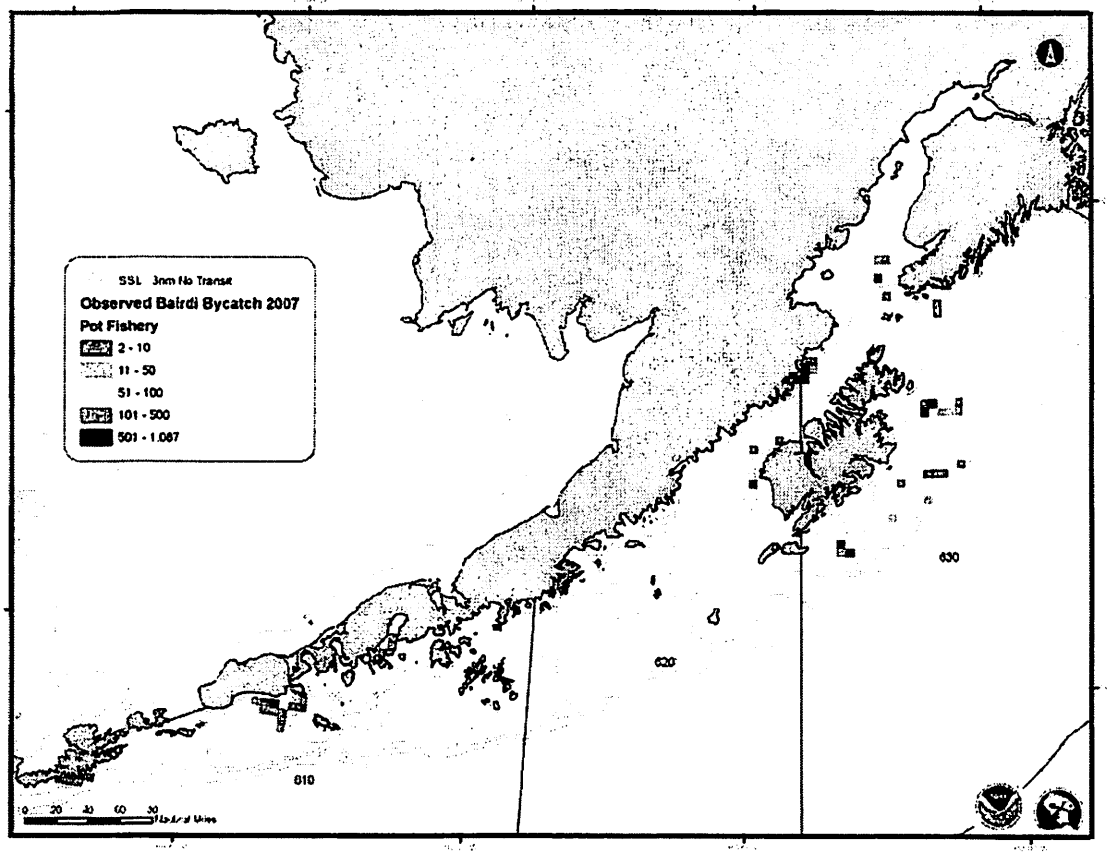


Figure 25 (on pages D and K, at the end of this document) map the average observed number of *C. bairdi* for 2003-2007. Figure 22 and
Figure 26, also on pages I and M, illustrate the average bycatch rate, mapping the number of *C. bairdi* per metric ton of groundfish, for the same years. Because 2007 was a year of high bycatch in both gear types, maps illustrating the location of bycatch just in that year are also provided (Figure 23 and Figure 24, on pages J and K), and show a smaller footprint for the fisheries, particularly the pot fishery. Other closures already in effect for non-pelagic trawl and pot fisheries are illustrated on the maps.

6.5 Bycatch of *C. bairdi* in the State waters Pacific cod pot fishery

The State-managed Pacific cod fishery in western and central GOA began in 1997, and is only open to pot and jig gear. The fishery is managed in five districts: South Alaska Peninsula, Chignik, Kodiak, Cook Inlet, and Prince William Sound. The State bases its guideline harvest level on the Federal acceptable biological catch for Pacific cod, and the Council and NMFS reduce the Federal total allowable catch for Pacific cod to accommodate the State fishery. In most cases, the fisheries open one week after the close of the Federal Pacific cod A season, and occur in late February – April.

[8] Observers do not sample the entire haul from a fishing tow, but rather collect one or several basket samples. The number of *C. bairdi* collected within the basket sample is extrapolated by the Observer Program to represent the number of *C. bairdi* caught in the entire haul. Extrapolating to the haul level allows the data to be better compared across hauls, even though individual sample sizes may differ.

In the discussion of bycatch numbers for *C. bairdi* above, catch amounts attributable to the State Pacific cod fishery have not been included in the data. Because the State Pacific cod fishery guideline harvest level is based on the Federal acceptable biological catch for Pacific cod, NMFS inseason management tracks the catch of Pacific cod in the State water fishery, and also makes prohibited species catch extrapolations based on that groundfish catch. In order to provide the Council with a separate estimation of *C. bairdi* crab taken in the Federal and State fisheries, crab bycatch in the State Pacific cod pot fishery was identified based on the date and location of catch. These data are presented separately in this section.

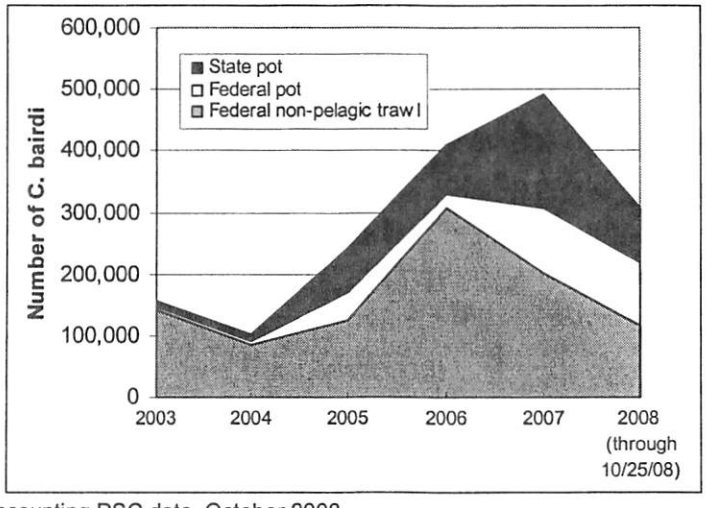
Table 18 identifies the *C. bairdi* bycatch attributable to the State managed Pacific cod pot fishery, which varied from approximately 6,600 crab in 2003, to 184,566 crab in 2007[9]. The contribution of the State managed fishery to overall *C. bairdi* bycatch in the GOA ranged from a low of 4%, in 2003, to a high of 37%, in 2007. Since 2005, the State Pacific cod fishery has contributed a minimum of 20% to the overall *C. bairdi* bycatch in the GOA (Figure 5). It is worth nothing that the bycatch estimates from the State managed fishery are based on minimal observer coverage, and these estimates should be interpreted with caution.

Table 18 *C. bairdi* bycatch in Federal and State groundfish fisheries, 2003-2008

	2003	2004	2005	2006	2007	2008 (through 10/25/08)
Federal fisheries (hook and line, pot, and trawl)	148,856	91,530	171,532	332,268	309,956	222,064
State Pacific cod fishery (pot gear)	6,515	11,081	72,733	78,729	184,566	85,495
Grand Total	**155,372**	**102,610**	**244,265**	**410,997**	**494,522**	**307,559**
State as % of total	4.2%	10.8%	29.8%	19.2%	37.3%	27.8%

Source: NMFS catch accounting PSC database, October 2008.

Figure 5 Federal and State *C. bairdi* bycatch in GOA groundfish fisheries



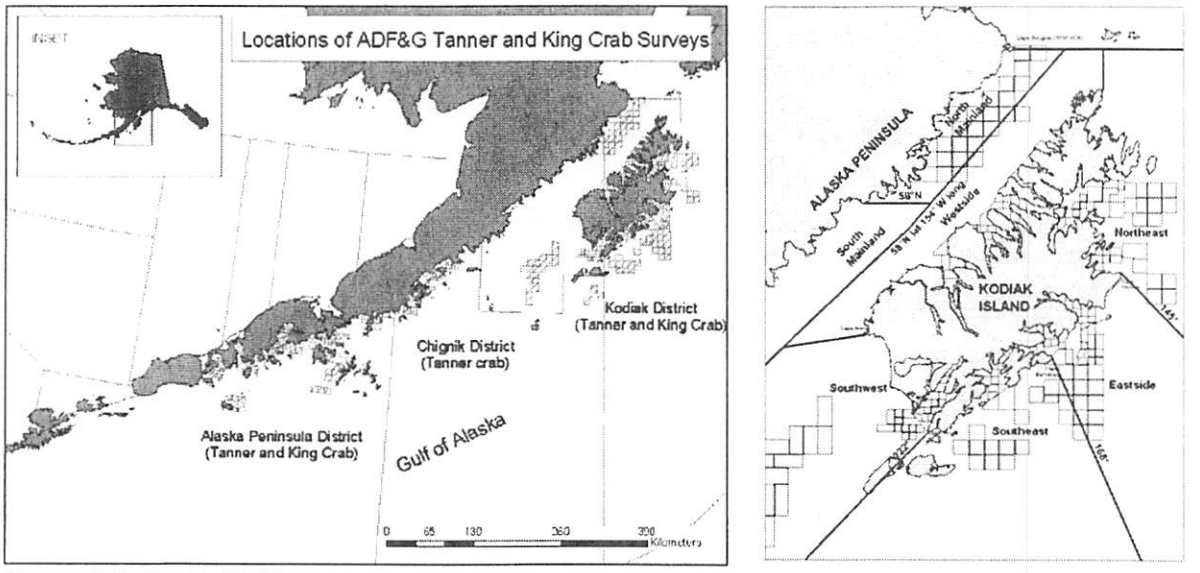
Source: NMFS catch accounting PSC data, October 2008.

[9] In previous versions of this discussion paper, the *C. bairdi* crab bycatch attributable to the State versus Federal pot fishery was not presented separately.

7 *C. bairdi* Tanner crab stocks and directed fisheries

Crab fisheries in the GOA are managed by the State of Alaska. Abundance estimates are produced by region (where possible). For most regions, actual abundance estimates are limited and commercial fishing has been closed. An annual trawl survey is conducted by ADFG. The survey methodology is designed to concentrate sampling in areas of historical king and Tanner crab abundance (Figure 6).

Figure 6 ADF&G trawl survey stations for Tanner and king crab abundance, and fishery management districts around Kodiak Islands

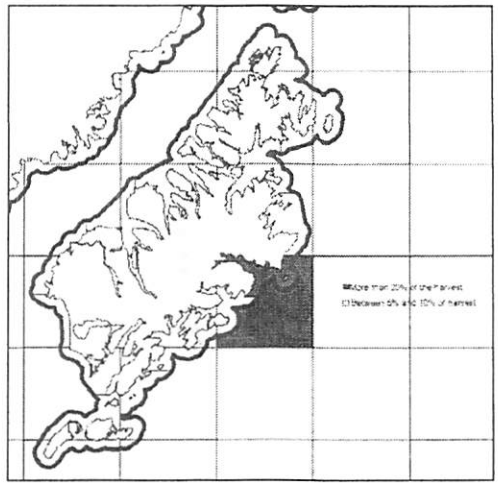


Source: K Spalinger, ADFG

Commercial fishing for *C. bairdi* in 2007 occurred in areas of the Eastside and Northeast sections of the Kodiak District and the Western section of South Alaska Peninsula District. Guideline harvest levels (GHLs), by region, are the following for 2009: Kodiak (Eastside and Northeast sections combined) 400,000 pounds and South Peninsula 275,000 pounds (ADFG 2008). In 2007, the GHL for the two Kodiak districts was 800,000 pounds, and for the South Peninsula was 200,000 pounds (ADFG 2007).

ADFG staff mapped the location of the majority of Tanner crab harvest, on average, between 2005-2008 (Figure 7). It was noted that relative importance of harvest may vary on a year to year basis.

Figure 7 Location of high percentages of the Tanner crab harvest, based on 2005-2008 average.



Note: Only one statistical area, Kiliuda, was not included that was important in one year.
Source: K. Spalinger, ADFG

Population estimates for 1997-2006, based on the ADFG surveys, are provided in Figure 8 and Figure 9 for the Kodiak and the South Peninsula District (Spalinger 2006). For the South Peninsula this estimate represents an increase from the previous survey. Recent survey results indicate an increase in females from 2006–2007 (Spalinger 2007). Maps of the mature male and female Tanner crab density, from the 2007 ADFG survey, are included as Figure 16, on page C at the end of this document.

Population estimates for Cook Inlet management region list male *C. bairdi* Tanner crab abundances in the Southern region as 3.1 million males, however it was noted that the estimate of legal sized males is at a historic low. Female abundance in this region was estimated at 2.1 million crabs in 2001, primarily due to a very high number of estimated juveniles. The southern region has been closed to commercial fishing due to low crab abundances since 1995 (Bechtol et al. 2002).

The Kamishak and Barren Islands District of the Cook Inlet management region has also been closed to commercial fishing (since 1991) due to concerns of low crab abundance. In these regions the male abundance is estimated at 6.1 million crabs, with a near historic low in mature males, while female abundance is estimated at 5.1 million crabs with a record low percentage of mature females. There are limited data to assess the Outer, Eastern, and Central Districts of the Cook Inlet management region, and both regions have been closed to commercial fishing (since 1998 for Central and 1993 for Eastern/Outer).

For the Southeast region, a population survey was begun in 1997/1998 to evaluate regional distribution of *C. bairdi* Tanner crab stocks and the relative abundance estimates. However, at present, no estimates of overall *C. bairdi* Tanner crab abundance in the region are available.

Figure 8 ***C. bairdi*** **Tanner crab population estimates for Kodiak District based on ADF&G trawl surveys 1997-2006**

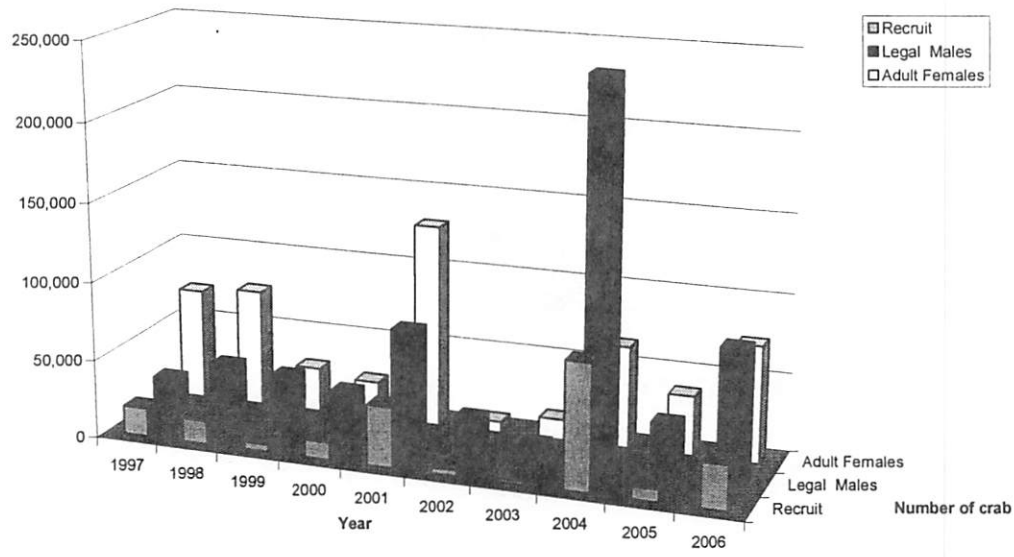
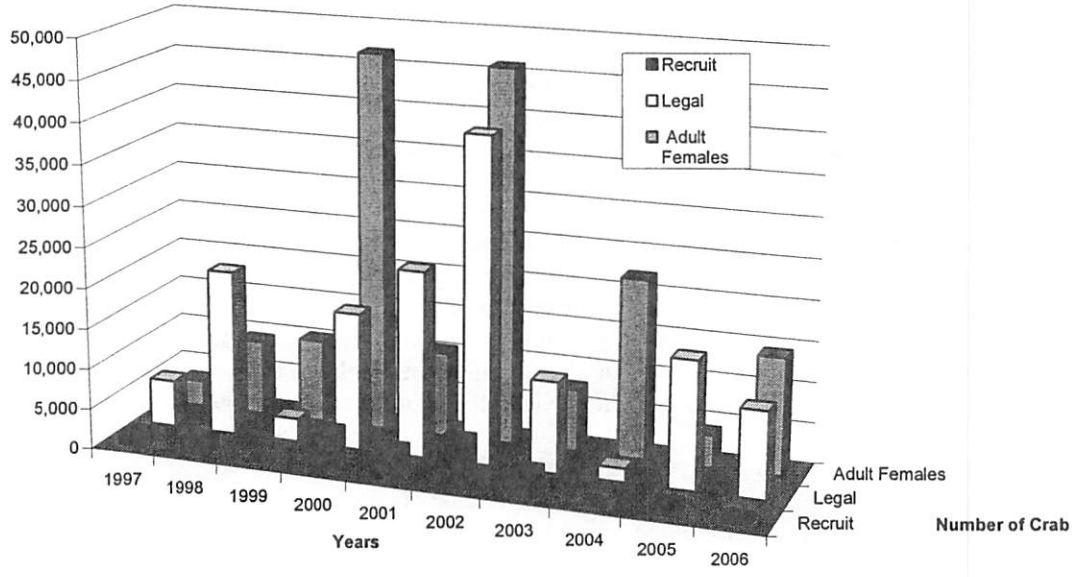


Figure 9 ***C. bairdi*** **Tanner crab population estimates for Alaska Peninsula District based on ADF&G trawl surveys 1997-2006**



8 Management options to reduce bycatch

In order for the Council to move forward with management options to reduce bycatch, it is important to determine what is the Council's desired objective, as this influences what management options will appropriately address the problem. The Council has already narrowed the scope of this discussion paper down to two species of interest: Chinook salmon and *C. bairdi* Tanner crab. Bycatch of these two species in the GOA groundfish fisheries is high relative to other salmon or crab species. The Council's purpose in trying to reduce bycatch is likely to be one of the following factors, or a combination of them: a. groundfish bycatch of these species represents a conservation concern; b. groundfish bycatch of these species is impacting directed fisheries for these species; or c. mortality caused by groundfish bycatch of these species is at a socially unacceptable level (note, this is ties into one of the Council's management objectives for the groundfish fisheries).

In all cases, the Council is evaluating whether the groundfish fisheries' bycatch levels cross a threshold at which corrective action is warranted. For various reasons, information is not available to determine, with specificity, to what degree the amount of bycatch taken in groundfish fisheries is likely to affect the sustainability of salmon and crab populations. Sections 5 and 7 provide limited information on the Chinook and *C. bairdi* populations, with which to put in context the bycatch numbers presented in the discussion paper. Based on this information, the Council will decide further action should be considered, and management options to reduce bycatch should be instituted.

The type of management options available to the Council include seasonal and permanent area restrictions to a particular gear type or target fishery; temporal area restrictions, that may be triggered by attainment of a bycatch limit; or creation of industry-level bycatch management entities that can effect real-time communication to avoid 'hotspot' areas of high bycatch. All of these management options have benefits and disadvantages, which cannot be fully analyzed in this discussion paper, but which will be addressed in detail should the Council choose to initiate an analysis. The sections below provide a brief outline of the management options that could be included in an analysis, as well as some preliminary strawman closures to illustrate some of the options.

8.1 Draft alternatives

The following suite of draft alternatives for reducing salmon and crab bycatch in the GOA groundfish fisheries were first proposed by the Council in December 2003, and have been iteratively refined since that time. In June 2008, the Council eliminated alternatives for salmon and crab species other than Chinook salmon and *C. bairdi* Tanner crab, and requested staff to begin to develop strawman closures to pair with the draft alternatives. The following are the draft alternatives:

Chinook Salmon

Alternative 1: Status quo (no bycatch controls).
Alternative 2: Trigger bycatch limits for salmon. Specific areas with high bycatch (or high bycatch rates) are closed seasonally (could be for an extended period of time) if or when a trigger limit is reached by the pollock fishery.
Alternative 3: Seasonal closure to all trawl fishing in areas with high bycatch or high bycatch rates.
Alternative 4: Voluntary bycatch cooperative for hotspot management.

C. bairdi Tanner Crab

Alternative 1: Status Quo (no bycatch controls).
Alternative 2: Trigger bycatch limits for Tanner crab. Specific areas with high bycatch (or high bycatch rates) are closed for the remainder of the year if or when a trigger limit is reached by:
Options: a) trawl flatfish fishery
b) all bottom trawling
c) groundfish pot
Alternative 3: Year-round closure in areas with high bycatch or high bycatch rates of Tanner crab by gear type.
Alternative 4: Voluntary bycatch cooperative for hotspot management.

In June 2005, the Council also provided, in their motion, the following comments on developing trigger limits, and general recommendations for an analysis.

Trigger limits:

1- Average numbers are not an appropriate approach to establishing trigger limits. The analysis should instead focus upon the use of biomass-based approaches for establishing appropriate trigger levels.
2- Trigger limits under consideration should be separated by gear type (i.e. separate limits for pot gear versus trawl gear)
3- Rather than considering an improperly defined duration of a triggered closure, the Council recommends moving in the direction of dynamic revolving closures (hot spots) which reflect the distribution and mobility of the crab population.

General recommendations for the analysis:

1- Differential discard mortality rates by gear type should be addressed in the analysis using the most up-to-date and applicable information.
2- Additional information must be included with respect to the overall precision of bycatch estimates given the low levels of observer coverage in many of the fisheries under consideration.
3- The addition of another alternative (from staff discussion paper) for an exemption from time and area closures if an observer is on board, seems pre-mature at this time.
4- Emphasis should be focused on alternatives 3 and 4 rather than focusing attention on trigger limits under alternative 2.
    a. With respect to alternative 3, additional information may be necessary (in addition to ADFG survey information and bycatch information from the NOAA groundfish observer program) in order to appropriately identify sensitive regions for year-round or seasonal closures. Some of this additional information may include catch data from the directed Tanner crab fisheries in these areas.
    b. Alternative 4 should include the concept of required participation in a contractual agreement for a hot spot management system
5- A rate-based approach format should be added as much as possible in all graphs and figures for the analysis.
6- Consideration should be given to the overall significance of the total amount of Tanner bycatch numbers as compared with the best available information on the population abundance in order to evaluate the actual population-level impact of the bycatch from the directed groundfish fisheries.

8.2 Estimating trigger limits

Trigger limits, as proposed under Alternatives 2, would close designated areas to all or specified gear types or target fisheries once a bycatch limit has been reached. PSC limits and associated closures have been used for salmon and crab bycatch in the Bering Sea groundfish fisheries (Witherell and Pautzke 1997). For instance, the pelagic trawl pollock fishery accounts for a high percentage of GOA Chinook bycatch. The Council might set a bycatch limit for Chinook salmon, and once it has been attained (either by the fleet as a whole, or exclusively by the pollock fishery), a designated area might be closed to pollock fishing for the remainder of the year or season. Likewise for Tanner crab, the Council might establish a linkage between the bycatch limit and the non-pelagic trawl flatfish fishery, and once the bycatch limit has been reached, an area closure could apply to the flatfish fishery.

In the past, the Council has provided direction to staff with respect to establishing trigger limits. Staff were encouraged to look at abundance-based methodologies for developing potential trigger limits. These could either be based on an estimate of, or float as a percentage of, the overall biomass of Chinook or *C. bairdi* species. This abundance-based approach has been used in the BSAI groundfish fisheries for crab species. A stair-step procedure of increasing PSC limits corresponding to higher population levels is in place for red king crab; an abundance-based zonal approach is used for *C. bairdi* Tanner crab; and the snow crab PSC limit is based on the percentage of annual biomass estimates. Biomass-based limits require a good understanding of the relative stock status for that species. Sections 5 and 7 provide an overview of stock status for Chinook salmon and *C. bairdi* Tanner crab in the GOA, but a detailed understanding of the health and vulnerability of crab stocks will be integral to determining the appropriate mechanism for establishing trigger limits, if the Council chooses to include a trigger limit management option in a future analysis.

The proposed alternatives using trigger closures would work similar to other existing PSC management measures. Currently in the GOA, PSC limits are only set for halibut in the flatfish fisheries, so that if the PSC limit for the target fishery (or group of target fisheries) is reached within a given season, the fishery (or fisheries) is closed for the remainder of the season. Establishing trigger bycatch limits for Chinook salmon or *C. bairdi*, as proposed under Alternatives 2, would result in a similar procedure. Inseason management would monitor the accrual of bycatch toward the PSC limit. As most of the GOA groundfish fisheries are subject to less than 100% observer coverage, bycatch rates from observed vessels would be applied to catch on unobserved vessels using the catch accounting database estimation procedure, described in Section 2.1.

In order to establish PSC limits for Chinook or *C. bairdi*, the Council would first establish what type of bycatch would accrue to the trigger limit (e.g., all bycatch by any gear type, or specific bycatch by gear type, target fishery, and/or regulatory area). Next, the Council would establish what the consequence of arriving at the limit would be (e.g., an area closure for the remainder of the year or season), and to whom the consequence would apply (e.g., a particular gear type and/or target fishery).

It has been suggested that establishing trigger PSC limits for managing Chinook salmon and *C. bairdi* crab bycatch in the GOA is problematic. The low proportion of observed catch in the GOA means that the reporting of total bycatch numbers involves considerable extrapolation. Inherent in the catch estimation procedure is the fact that a catch of one salmon or crab in a small groundfish haul (resulting in a high bycatch rate) can sometimes be extrapolated to very large amounts of catch, resulting in exceedingly high bycatch totals for the GOA as a whole. The Alaska Fisheries Science Center is looking into the possibility of including estimates of statistical confidence into the bycatch estimation procedure, but for the moment, the current procedure is the best available. It is also the procedure that is currently used to manage the PSC limit for halibut in the GOA.

8.3 Determining appropriate area closures and preliminary strawman closures

Year-round and seasonal closures, such as those proposed under Alternatives 3, have also been used in both the GOA and BSAI fisheries to control the bycatch of prohibited species. Currently, in the GOA, trawl closure areas have been implemented around Kodiak Island to protect red king crab. Area closures can also be associated with PSC trigger limits, as under Alternatives 2, so that a particular area is closed once the PSC limit is reached.

For salmon, the highest bycatch is seasonal, and is tied to the timing of the pollock fishery. Seasonal closures of hot spot locations could merit examination, rather than year-round closures. Seasonal salmon closures have been used to control salmon bycatch in the BSAI groundfish fisheries, although in recent years these closures have been problematic, and measures to address salmon bycatch, including revised area closures and PSC limits that would close the pollock fishery when triggered, are currently under review (NMFS 2008). Given that the Council is currently revising bycatch reduction measures for salmon in the BSAI, any measures evaluated in the GOA should consider and build upon lessons learned in the BSAI.

There are various methodologies available for identifying appropriate areas to close in order to reduce bycatch of salmon and crab. One such is to look at areas of high abundance of the species in question, and restrict fishing in those areas. This methodology could be used for crab, but as discussed above, is less effective for Chinook salmon. To some extent, closures that protect *C. bairdi* crab are already in effect for non-pelagic trawl vessels, such as the Type I and II red king crab closures as well as State water closure, which encompass some areas of high Tanner crab abundance (see Section 7). However, Tanner crab abundance is variable from year to year, as are bycatch patterns, which complicates the identification of key abundance areas.

Another methodology that was used by the Council to create habitat closures in the Aleutian Islands and the northern Bering Sea is the footprint approach. For example, in the Aleutian Islands, closures were intended to protect coral (and fish habitat), and little is known about the abundance of coral in those areas. Closures in this instance were identified to contain fishing within historic limits. The footprint approach is not necessarily helpful when protecting highly mobile species such as salmon, however.

The default methodology for this preliminary analysis is to use bycatch locations as a proxy for abundance, and identify closure areas based on the locations of hauls with observed bycatch. An average of bycatch in 2003-2007 is used for the analysis. There are many problems with this approach, some of which have already been described above. The observed fishing trips represent only a relatively small proportion of total fishing trips in the western and central GOA. Areas with high numbers of bycatch also tend to be the areas where most of the catch is occurring. This issue is addressed by looking at bycatch rates (e.g. crab/mt groundfish) instead of looking at absolute bycatch numbers. However, bycatch rates are also problematic because some of the highest bycatch rates arise from having one salmon or crab caught in a small tow of groundfish, which may not necessarily be representative of a high abundance area that would benefit from a closure.

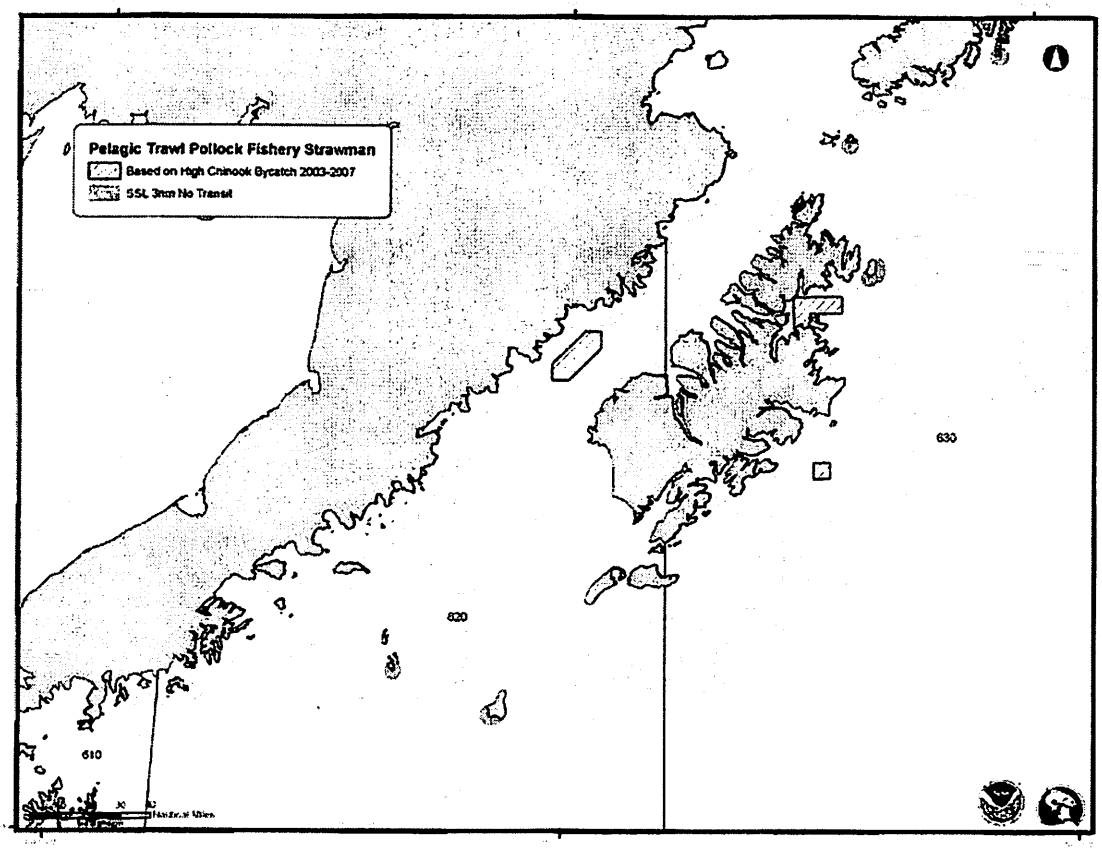
Additionally, bycatch patterns (as with abundance patterns for Tanner crab) are highly variable from year to year. The correlation between the location of fishery catch and salmon and crab bycatch has not been fully investigated, but preliminary analysis seems to indicate that the variability is as much a function of salmon and crab life history changes or abundance as it is changes in the fleet's fishing patterns. This complicates the identification of appropriate closure areas to protect Chinook salmon and *C. bairdi* crab, as a closure that might be appropriate to protect the species in one year may be ineffective in another one. This appears to have been the case with the salmon closure areas for Chinook and chum salmon in the BSAI, which are currently under review by the Council.

Strawman closures for Chinook salmon

For Chinook salmon, staff tried to look at separate strawman closures for vessels using pelagic and non-pelagic trawl gear. While the majority of salmon overall is taken in the pollock pelagic trawl fishery, the non-pelagic trawl fisheries combined contribute an average of 25% to the total GOA Chinook bycatch. Based on the observer data, however, it was very difficult to identify hotspot bycatch areas that could serve as strawman closure areas. For this reason, strawman closures for non-pelagic trawl gear are not included in this discussion paper, although it is possible that further detailed analysis of the observer data may be able to suggest a different methodology for identifying closures for this gear type in the future.

For pelagic trawl, strawman closures were identified based on high incidence of Chinook salmon in the pelagic pollock trawl fishery (Figure 27 and Figure 28, on pages N and O, at the end of this document). The closures were identified by selecting areas with the highest category of observed bycatch, extrapolated to the haul level, and also include any areas of the second highest category that surround it. An attempt was made to include areas of at least two blocks of high or highest catch. The closure areas are overlaid on maps of the observed number of Chinook salmon, and rate of observed salmon per mt of groundfish, for the pelagic trawl fishery. This methodology results in two closures areas, both of which occur in the central GOA (Figure 10).

Figure 10 Chinook salmon strawman closures for pelagic trawl gear, based on high incidence of bycatch, averaged over 2003-2007



Strawman closures for *C. bairdi* Tanner crab

For *C. bairdi* crab, staff has looked at separate strawman closure areas for vessels using non-pelagic trawl gear and those using pot gear. The strawman closures do not overlap at all. All closure areas for non-pelagic trawl gear fall in the central GOA, as areas of bycatch in the western GOA did not meet the criteria used to develop the strawman areas. Pot strawman closures do extend into the western GOA. In order to provide different perspectives on the closures, given the problems with developing closures as noted above, staff looked at several ways of identifying strawman closures.

The first set of strawman closures (Figure 29 and Figure 33, on pages N and T at the end of this document) looks at areas of high incidence of bycatch. The closures were identified by selecting areas with the highest category of observed bycatch, extrapolated to the haul level, and also include any areas of the second highest category that surround it. An attempt was made to include areas of at least two blocks of high or highest catch. The closure areas are overlaid over a map of the bycatch rates by area for that gear type, and also included on the map are any existing closures that pertain to that gear type. The areas that are identified in the figures are also areas where the much of the catch is taken. Implementing these closures will be disruptive to the fishery, and displacement of effort will occur, which may result in lower catch per unit effort which could also lead to other bycatch concerns. The non-pelagic trawl and pot closures identified through this method occur in completely different areas, and there is no overlap between them. Figure 11, below, illustrates the non-pelagic trawl and pot strawman closures on the same map, for the central GOA. Figure 12 identifies only pot strawman closures, but for both the western and central GOA. There are seven individual pot closure areas identified, five in the central GOA and two in the western GOA.

Figure 11 ***C. bairdi* crab strawman closures in the central GOA, for non-pelagic trawl and pot gear, based on high incidence of bycatch, averaged over 2003-2007**

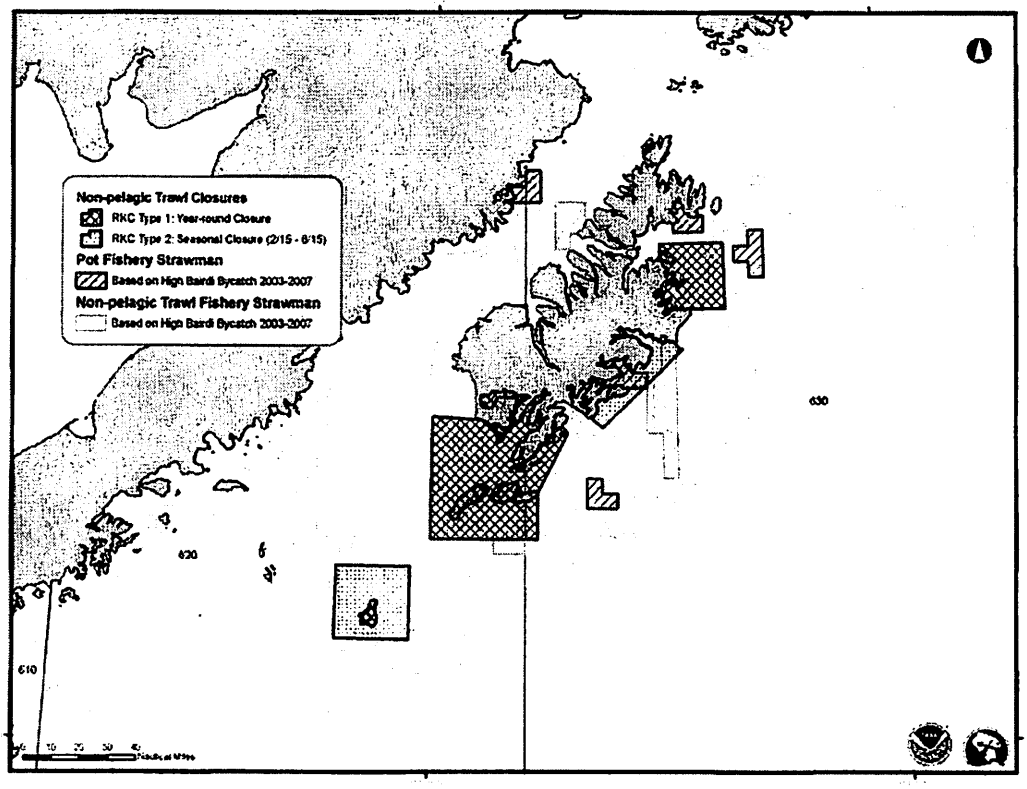
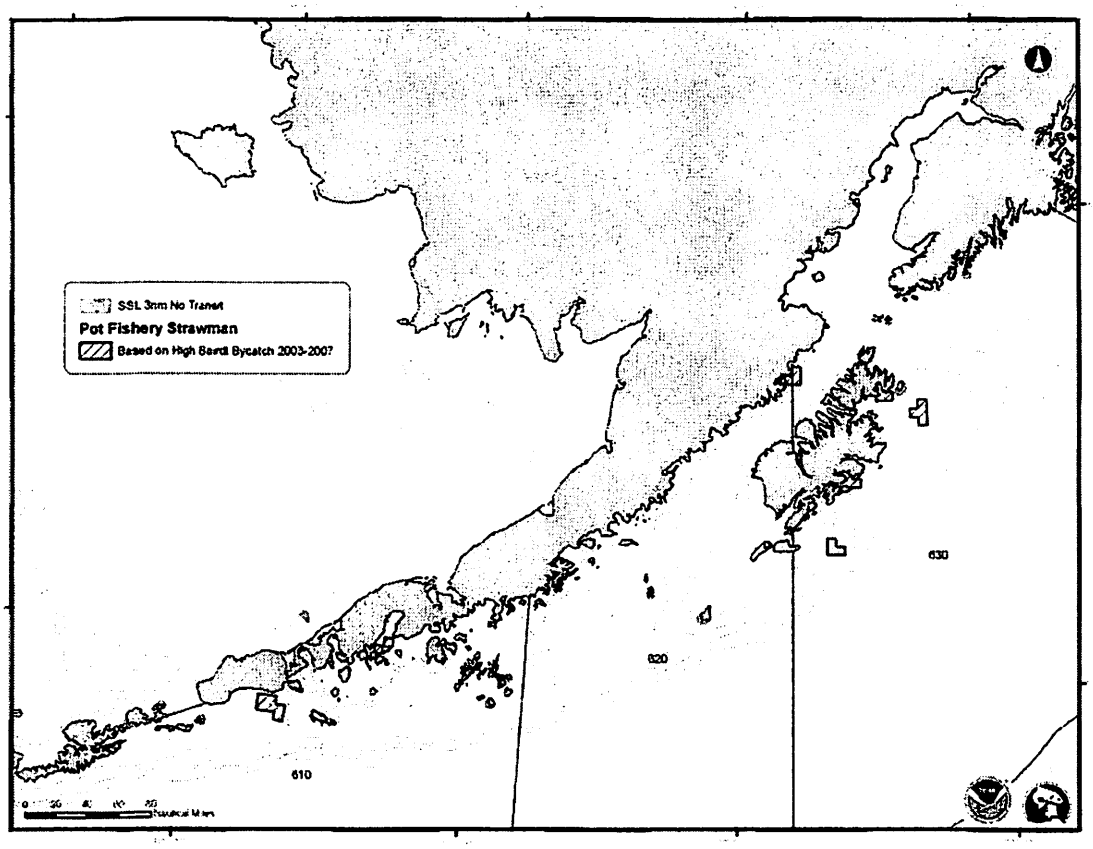


Figure 12 ***C. bairdi*** **crab strawman closures for pot gear in the western and central GOA, based on high incidence of bycatch, averaged over 2003-2007**



Staff also looked at areas where bycatch has repetitively been observed, without looking at the amount of bycatch that was reported for those areas. Areas that have repetitive bycatch may also be candidates for closure areas, and looking at bycatch in this way eliminates the extrapolation that occurs under the set of high incidence strawman closures. However, it is also likely that these areas are also the most heavily fished. The areas identified using this approach are similar to the areas identified using the high incidence of bycatch approach, and staff did not reproduce them in this paper.

Another way to look at high incidence bases closure areas on an analysis of the top 10% of records of high bycatch (Figure 30 and Figure 34, on pages Q and U). Closure areas resulting from this analysis are mainly similar to the strawman closures identified just by looking at high incidence overall. The map plots both high bycatch records from observer samples, and high bycatch records from extrapolated observed hauls, and shows that there is very little difference between them for non-pelagic trawl gear, and no difference for pot gear.

For non-pelagic trawl gear, staff also provided another set of strawman closures identifying areas based on the bycatch rate (Figure 31, on page R). This approach results in fewer total closures areas than by looking at high incidence, and the closure areas do not overlap (see Figure 32 on page S for a comparison). This approach was not used to develop strawman closure areas using bycatch rate for pot gear. The methodology used by staff involves identifying blocks with the highest bycatch rate as those for the strawman closure, and for pot gear, there were no particular areas with high bycatch rates.

8.4 Voluntary bycatch cooperatives

Alternative 4 for both crab and salmon species would establish a bycatch pool or cooperative for hotspot area management. This alternative is designed after the current BSAI bycatch cooperatives, in use by industry to control salmon bycatch in the pollock fishery. Currently in the BSAI, a program of voluntary area closures exists with selective access to those areas for fleets which demonstrate success in controlling bycatch (Haflinger 2003, NMFS 2008). Voluntary area closures can change on a weekly basis, and depend upon the supply and monitoring of information by fishermen. The sharing of bycatch rates among vessels in the fleet has allowed these bycatch hotspots to be mapped and identified on a real-time basis, so that individual vessels can avoid these areas (Smoker 1996, Haflinger 2003, NMFS 2008). This system relies upon information voluntarily reported to Sea State by the fleet per their cooperative agreements.

A voluntary cooperative program could be modeled after the AFA catcher vessel Intercooperative Agreement among the nine catcher vessel cooperatives in the BSAI pollock fishery (Gruver 2003). Some aspects of this inter-cooperative agreement which would be useful to include in a GOA co-op alternative include provisions for: allocation, monitoring and compliance of the PSC caps amongst the catcher vessel fleet; establishment of penalties for co-ops which exceed allocations; promoting compliance with PSC limits while allowing for maximum harvest of allocated groundfish; and the reduction of PSC bycatch in the groundfish fishery. For the BSAI cooperative, Sea State is retained to provide data gathering, analysis and reporting services to implement the bycatch management agreement, and in doing so provides timely hot spot reports to the fleet, as well as summaries of bycatch characteristics, trends and/or fishing behaviors which may be having an effect on bycatch rates (Gruver 2003). Fleets are notified of avoidance areas for Chinook salmon and have previously agreed within the cooperative to avoid these areas as notified. Specific cooperative measures would need to be created for the characteristics of the GOA groundfish fishery; however measures from the BSAI cooperatives may prove useful in designing appropriate programs for salmon and crab bycatch co-ops in the GOA. An extensive discussion of the BSAI intercooperative agreement is included in the Draft Environmental Impact Statement for Bering Sea Chinook Salmon Bycatch (NMFS 2008).

9 Action by the Council

The decision before the Council is whether to initiate an analysis to examine one or more of the management options proposed in this discussion paper, or others that the Council may wish to include in an analysis. Strawman closures have been developed by staff in order to provide a starting point for discussion of management options that include spatial or temporal fishery closures.

If the Council chooses to initiate an analysis, the Council should articulate a problem statement for this action, and a set of alternatives to analyze. It would be helpful for staff to receive guidance on how to continue refinement of the strawman alternatives if they are to remain part of the package.

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TINRO-CENTRE. 2005. Russian Pacific Salmon Hatchery Releases, Commercial Fishery Catch Statistics, and Sport Fishery Harvest Statistics for 2004 season. (NPAFC Doc. 918 Rev. 1) 14 p. Pacific Scientific Research Fisheries Center (TINRO-Centre), 4, Shevchenko Alley, Vladivostok, 690950, Russia.

TINRO-CENTRE. 2006. Russian Pacific Salmon Hatchery Releases, Commercial Fishery Catch Statistics, and Sport Fishery Harvest Statistics for 2005 season. (NPAFC Doc. 918 Rev. 1) 14 p. Pacific Scientific Research Fisheries Center (TINRO-Centre), 4, Shevchenko Alley, Vladivostok, 690950, Russia.

Witherell, D, D. Ackley, and C. Coon. 2002. An overview of salmon bycatch in Alaska groundfish fisheries. Alaska Fishery Research Bulletin (9)1:53-64.

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11 Color figures

Figure 13 Locations of existing trawl fishery and crab protection closures in the Gulf of Alaska

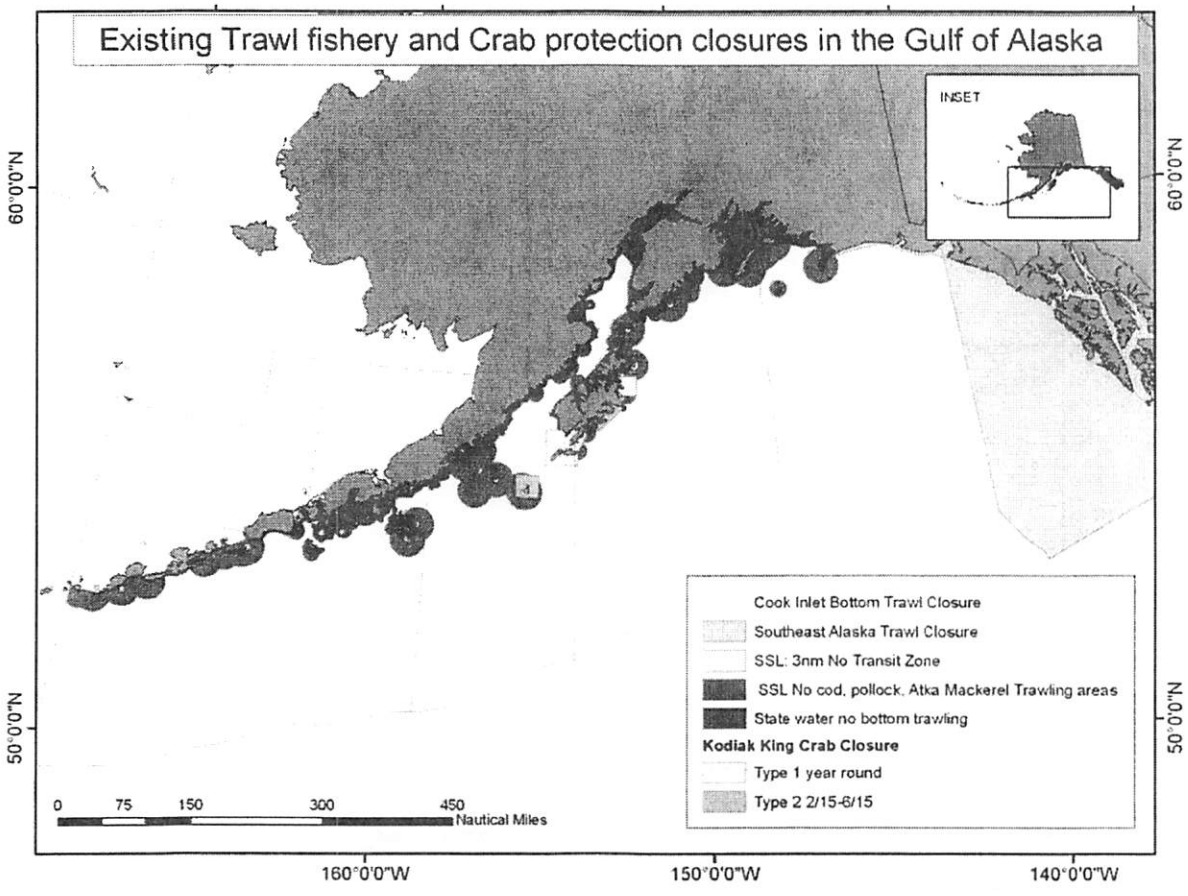


Figure 14 Locations of existing trawl fishery and crab protection closures in the Western Gulf of Alaska

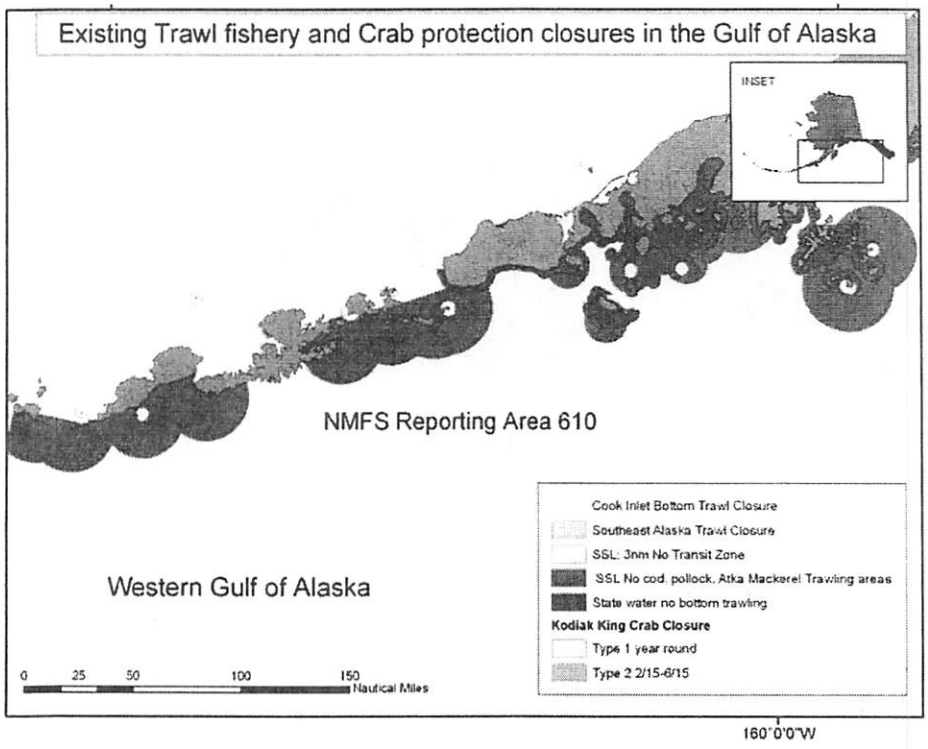


Figure 15 Locations of existing trawl fishery and crab protection closures in the Central Gulf of Alaska

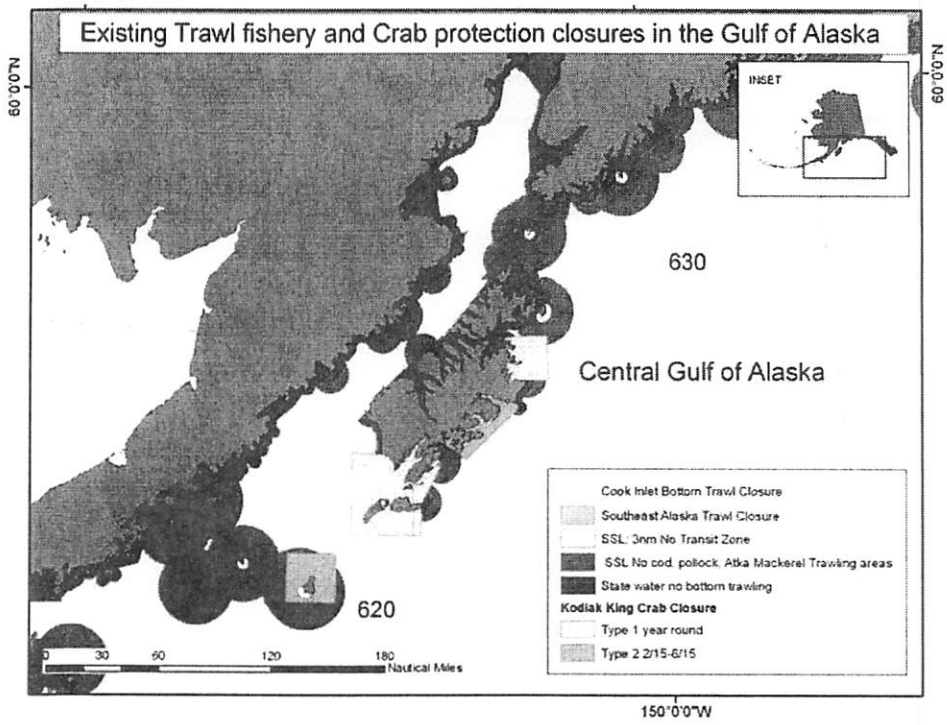
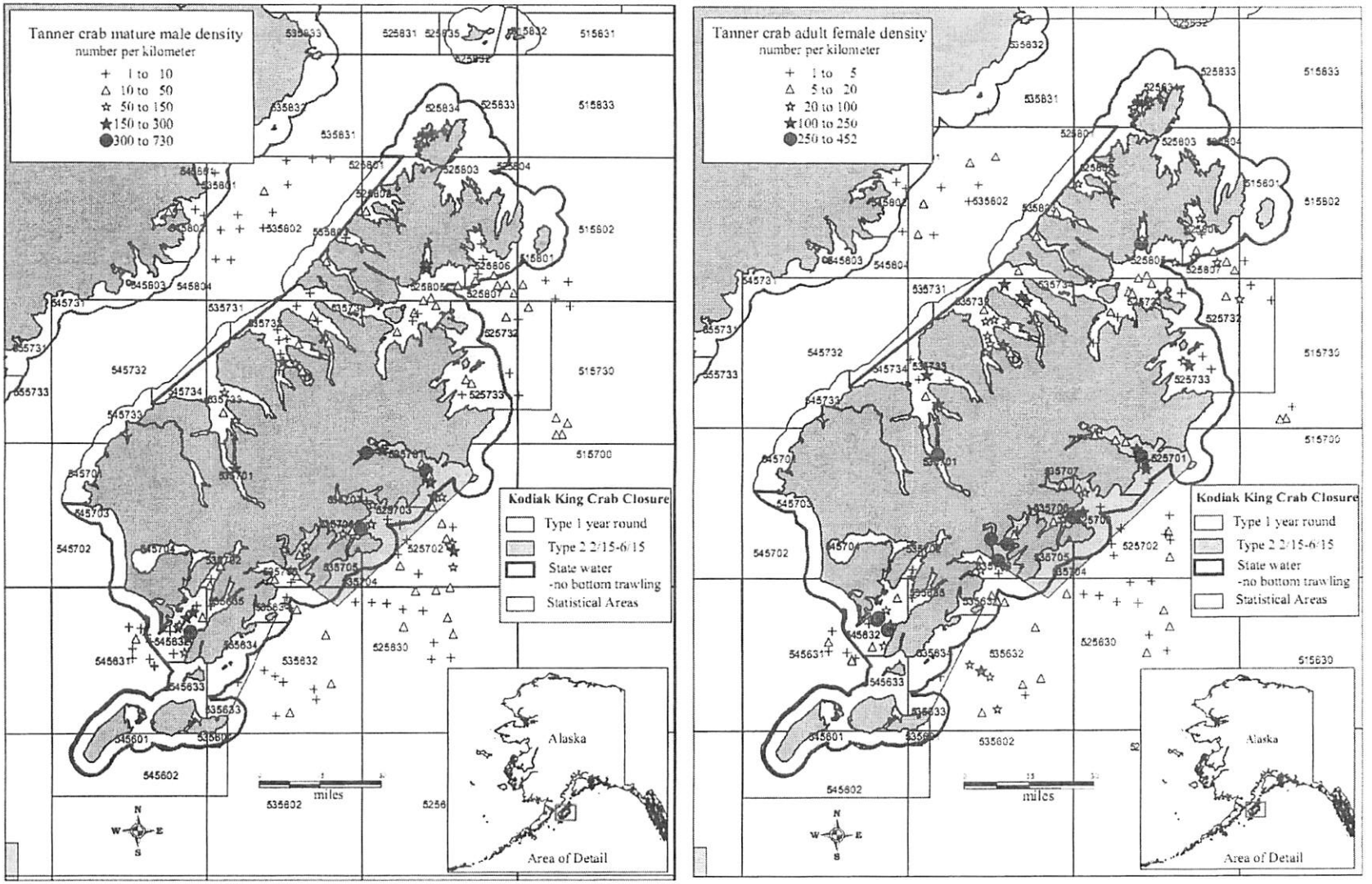


Figure 16 Mature male and female Tanner crab density, from the 2007 ADFG survey.



Source: K. Spalinger and N. Sagalkin, ADFG

Figure 17 Observed Chinook salmon bycatch in the pelagic pollock trawl fishery, averaged for 2003-2007

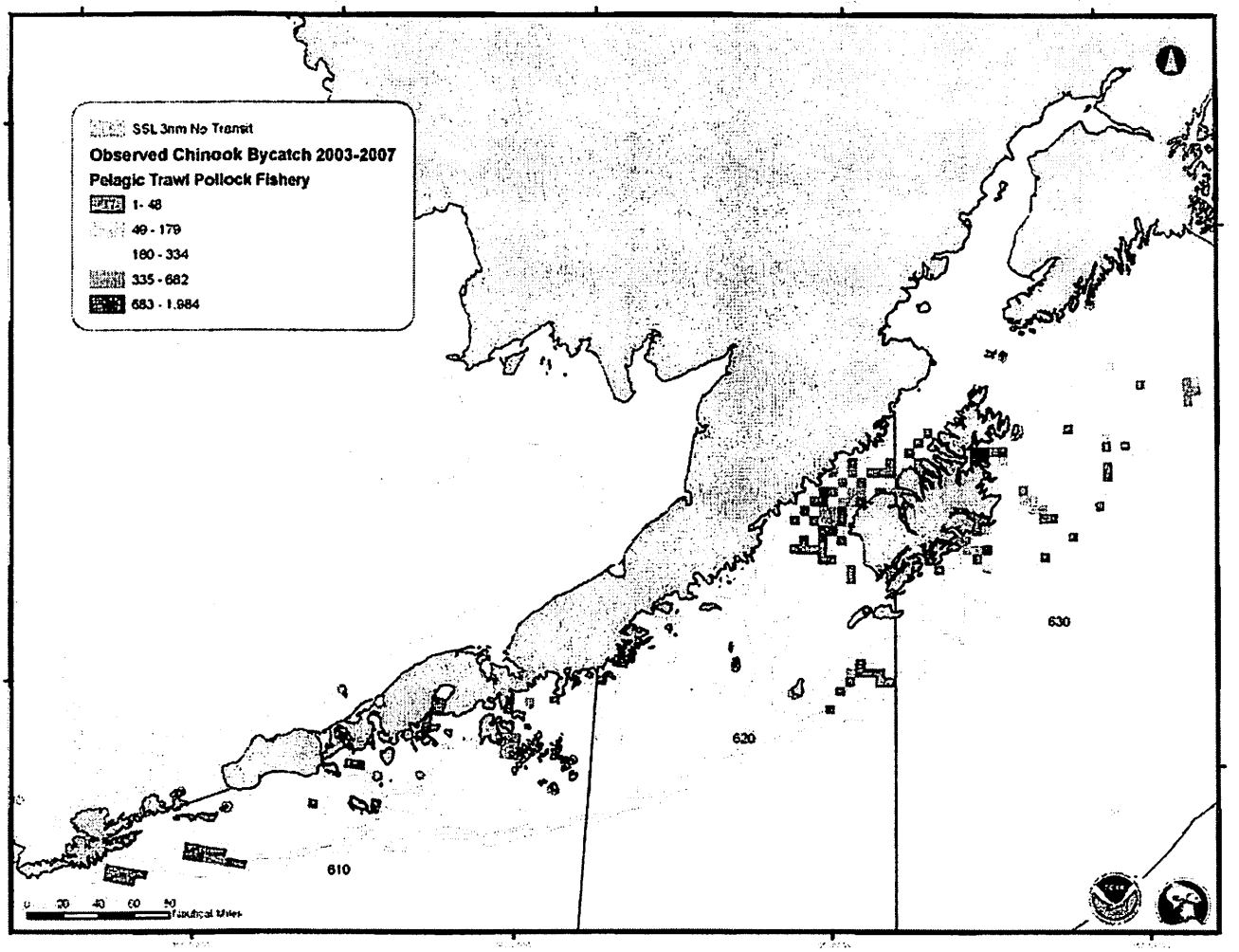


Figure 18 Observed Chinook salmon bycatch rate in the pelagic pollock trawl fishery, averaged for 2003-2007, number of crab per metric ton of groundfish

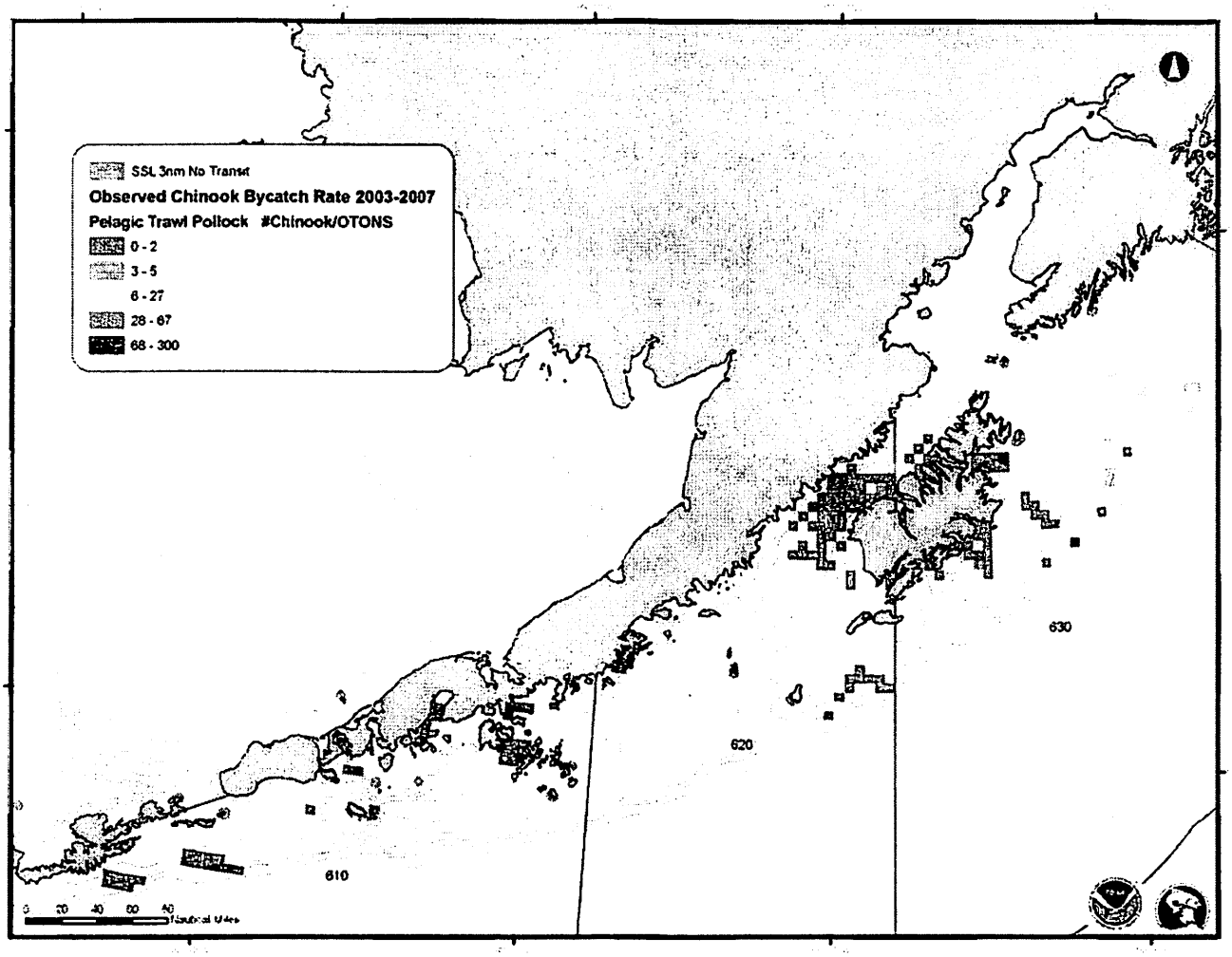


Figure 19 Observed Chinook salmon bycatch in the non-pelagic trawl fishery, averaged for 2003-2007

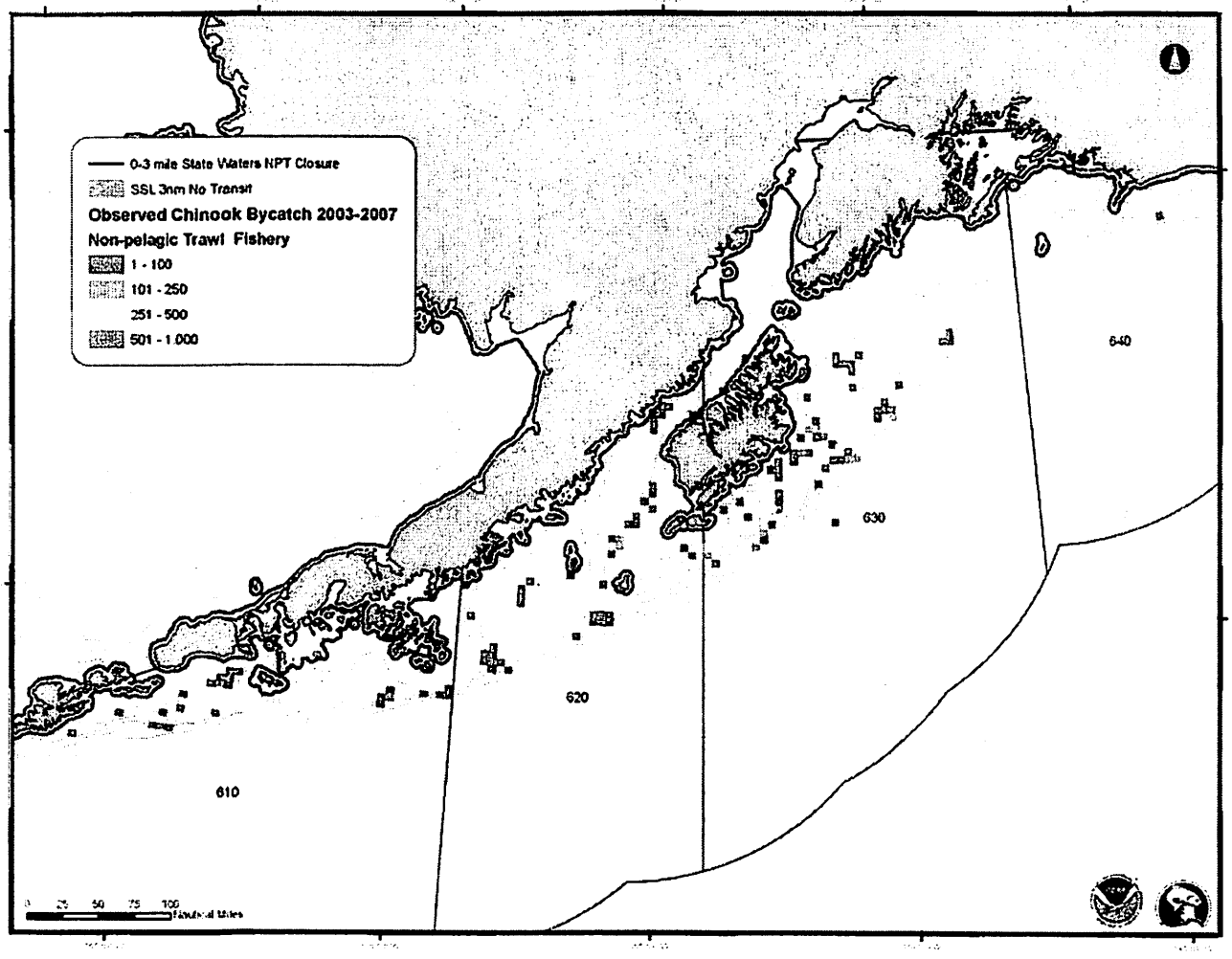


Figure 20 Observed Chinook salmon bycatch rate in the non-pelagic trawl fishery, averaged for 2003-2007, number of crab per metric ton of groundfish

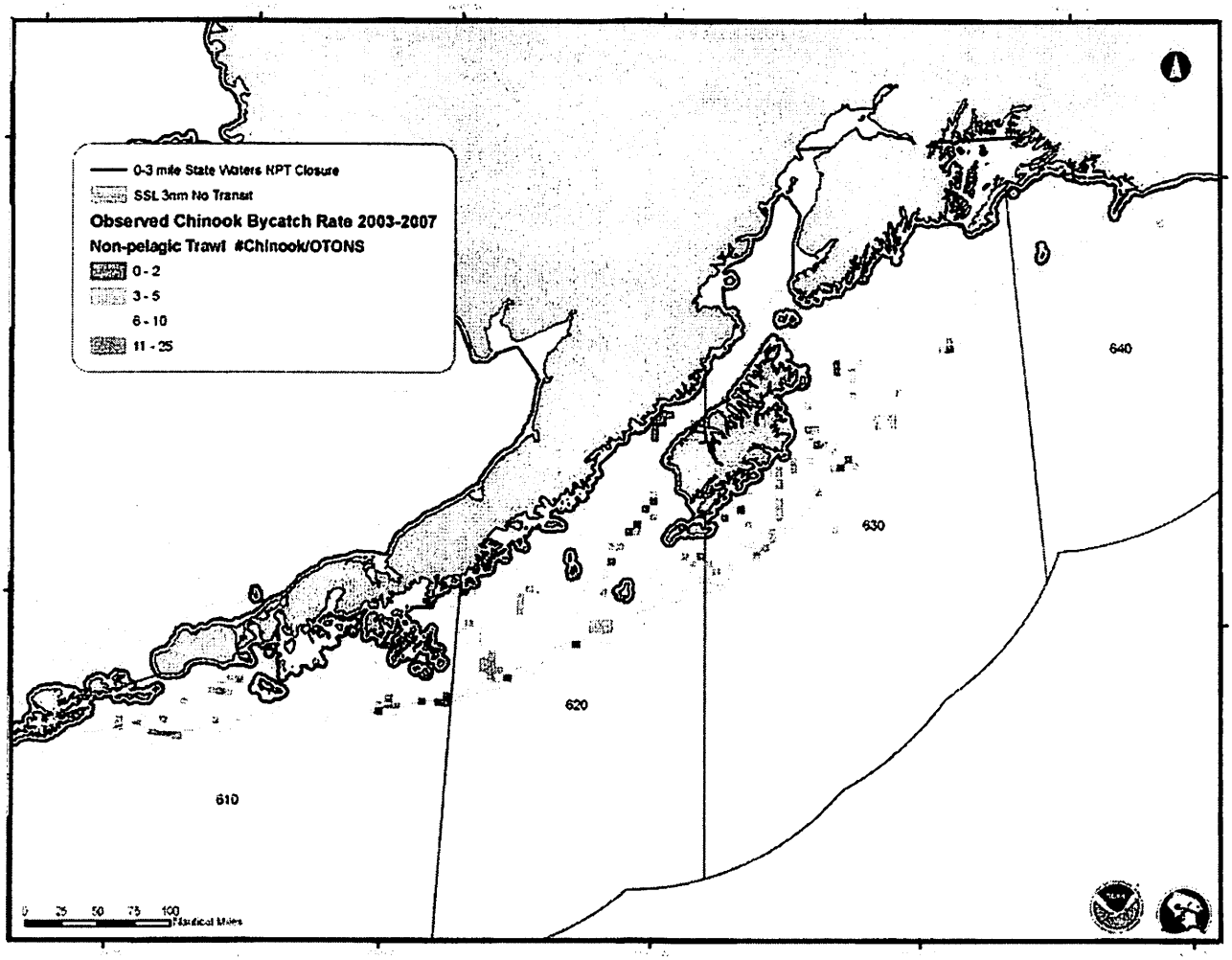


Figure 21 Observed *C. bairdi* Tanner crab bycatch in the non-pelagic trawl fishery, averaged for 2003-2007

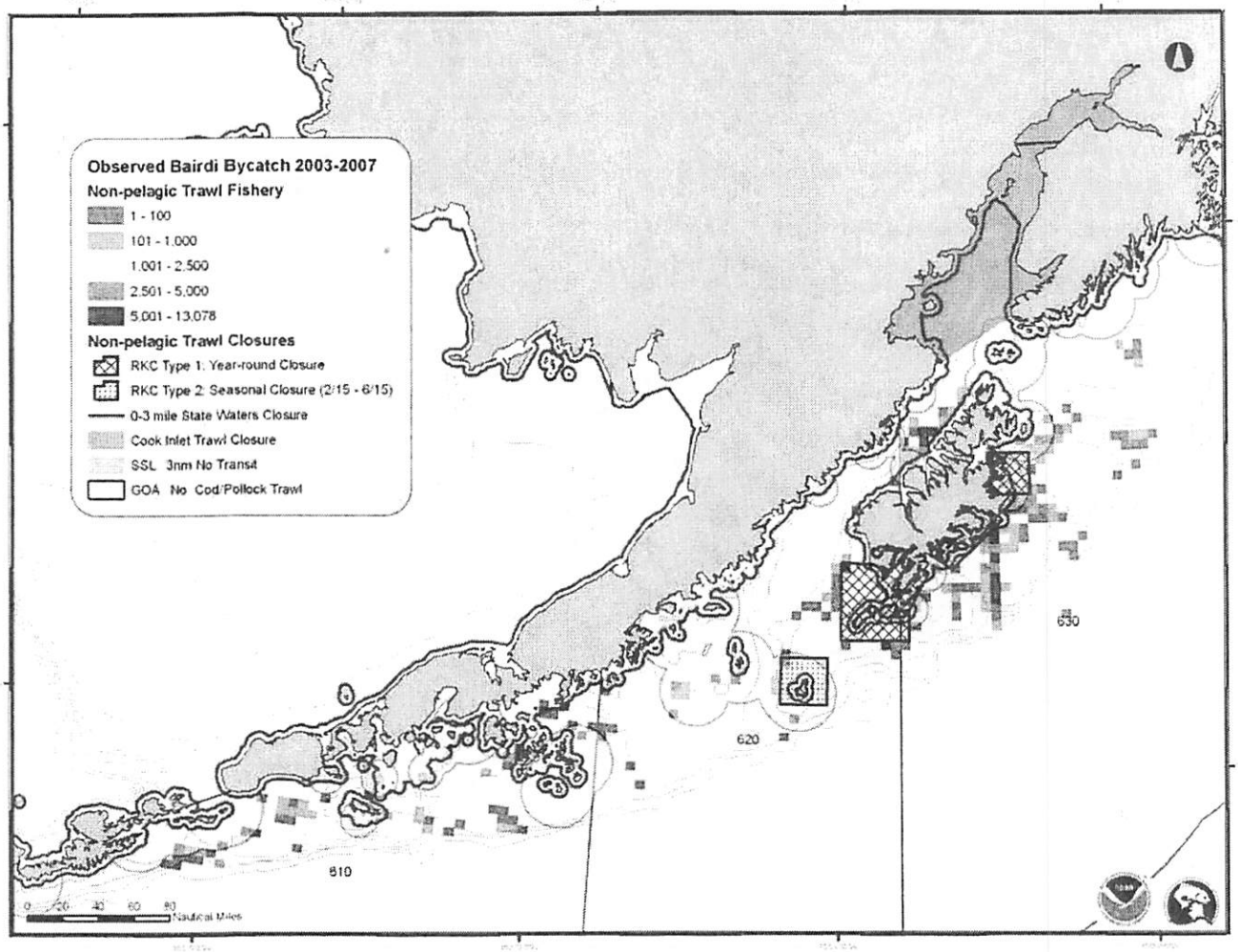


Figure 22 **Observed *C. bairdi* Tanner crab bycatch rate in the non-pelagic trawl fishery, averaged for 2003-2007, number of crab per metric ton of groundfish**

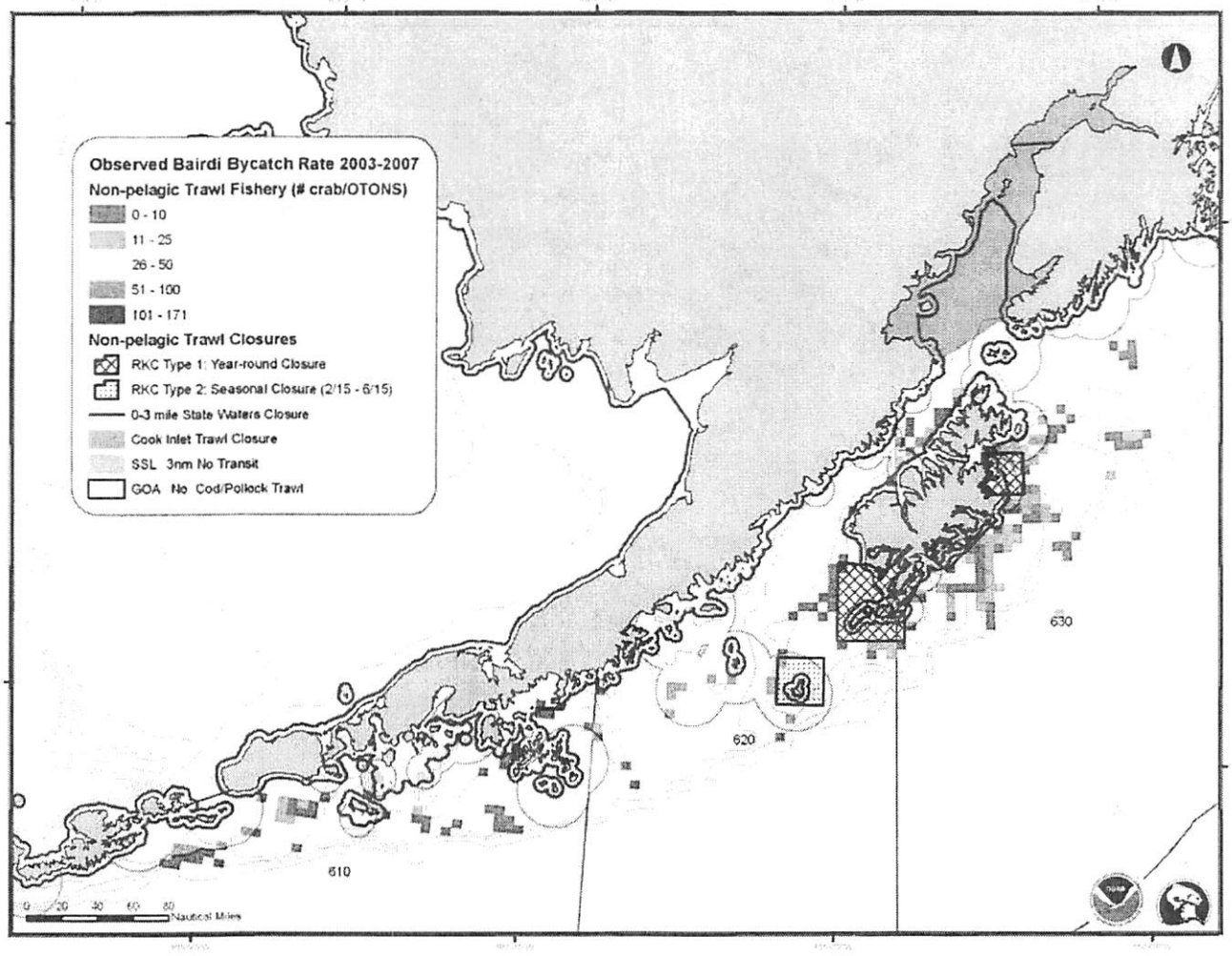


Figure 23 Observed *C. bairdi* Tanner crab bycatch in the non-pelagic trawl fishery, 2007 only

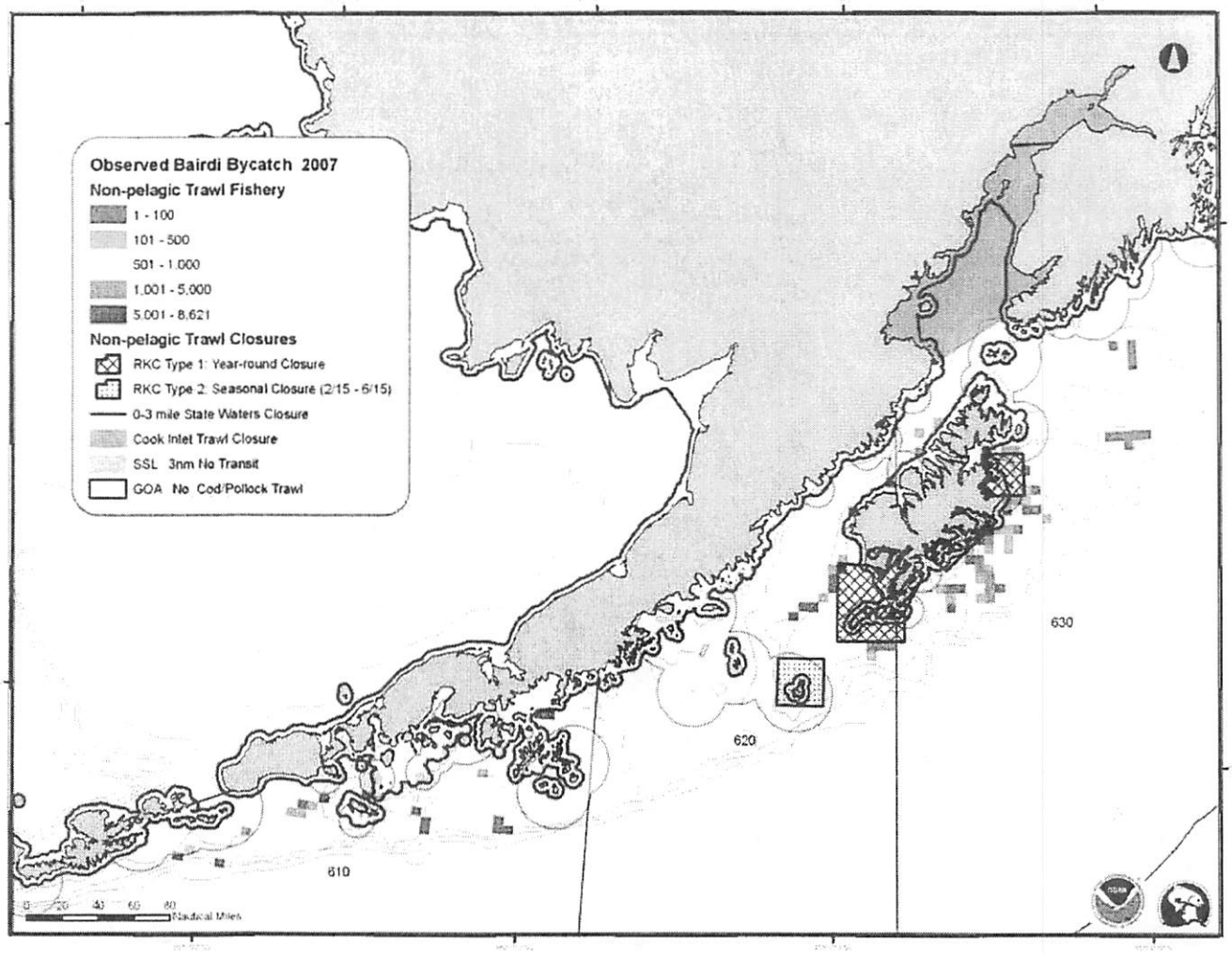


Figure 24 Observed *C. bairdi* Tanner crab bycatch in the Federal pot fishery, 2007 only

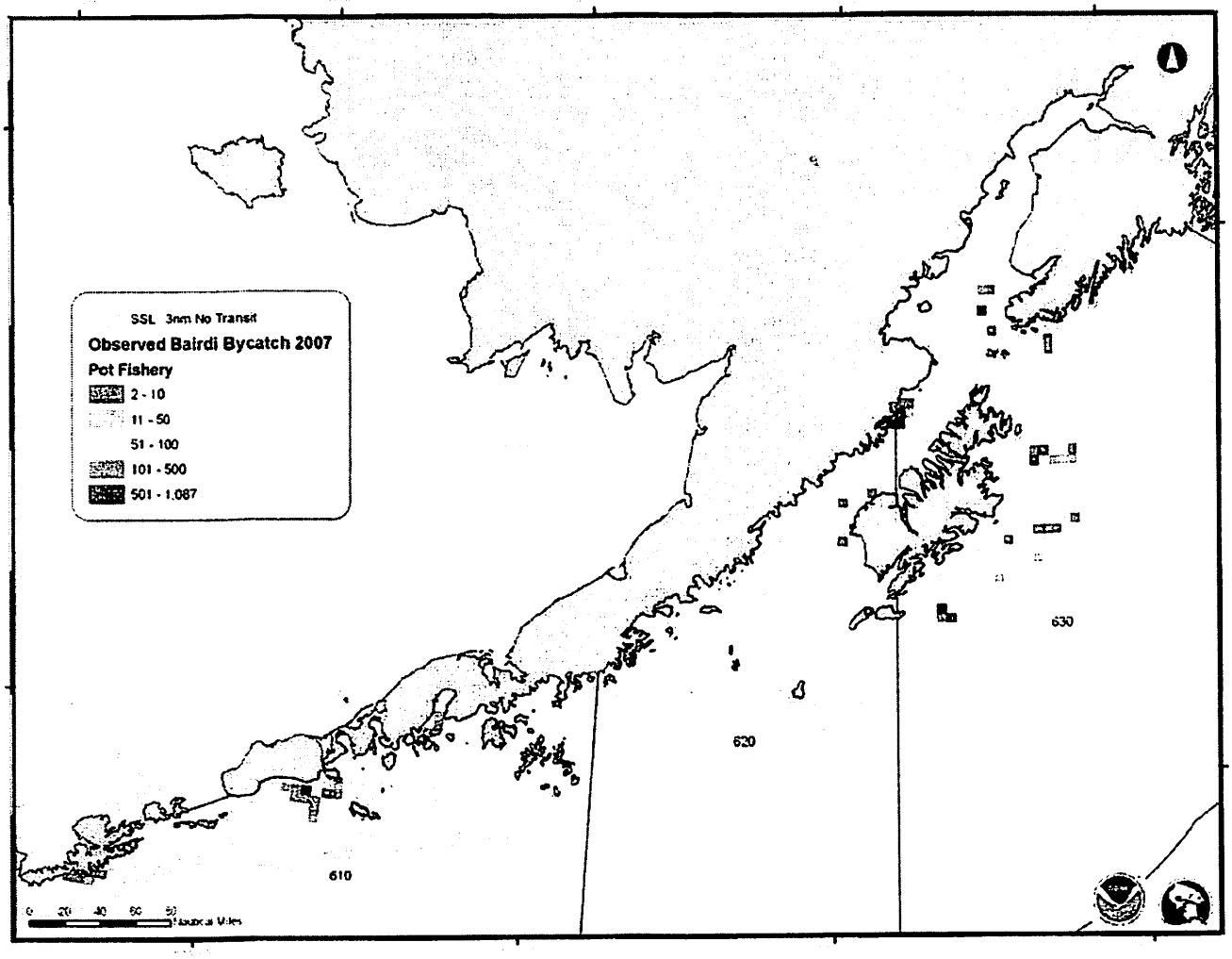


Figure 25 Observed *C. bairdi* Tanner crab bycatch in the Federal pot fishery, averaged for 2003-2007

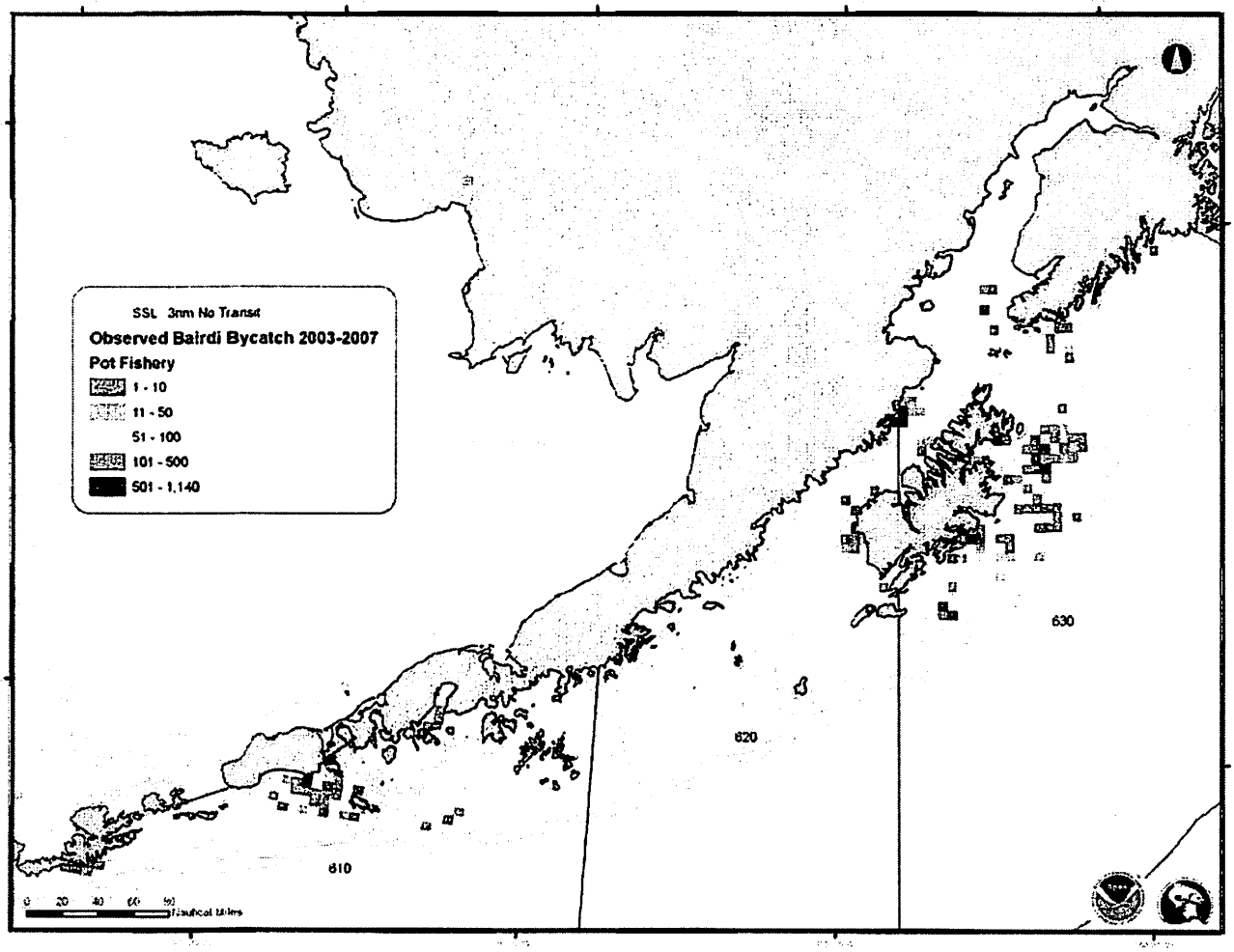


Figure 26 **Observed *C. bairdi* Tanner crab bycatch rate in the Federal pot fishery, averaged for 2003-2007, number of crab per metric ton of groundfish**

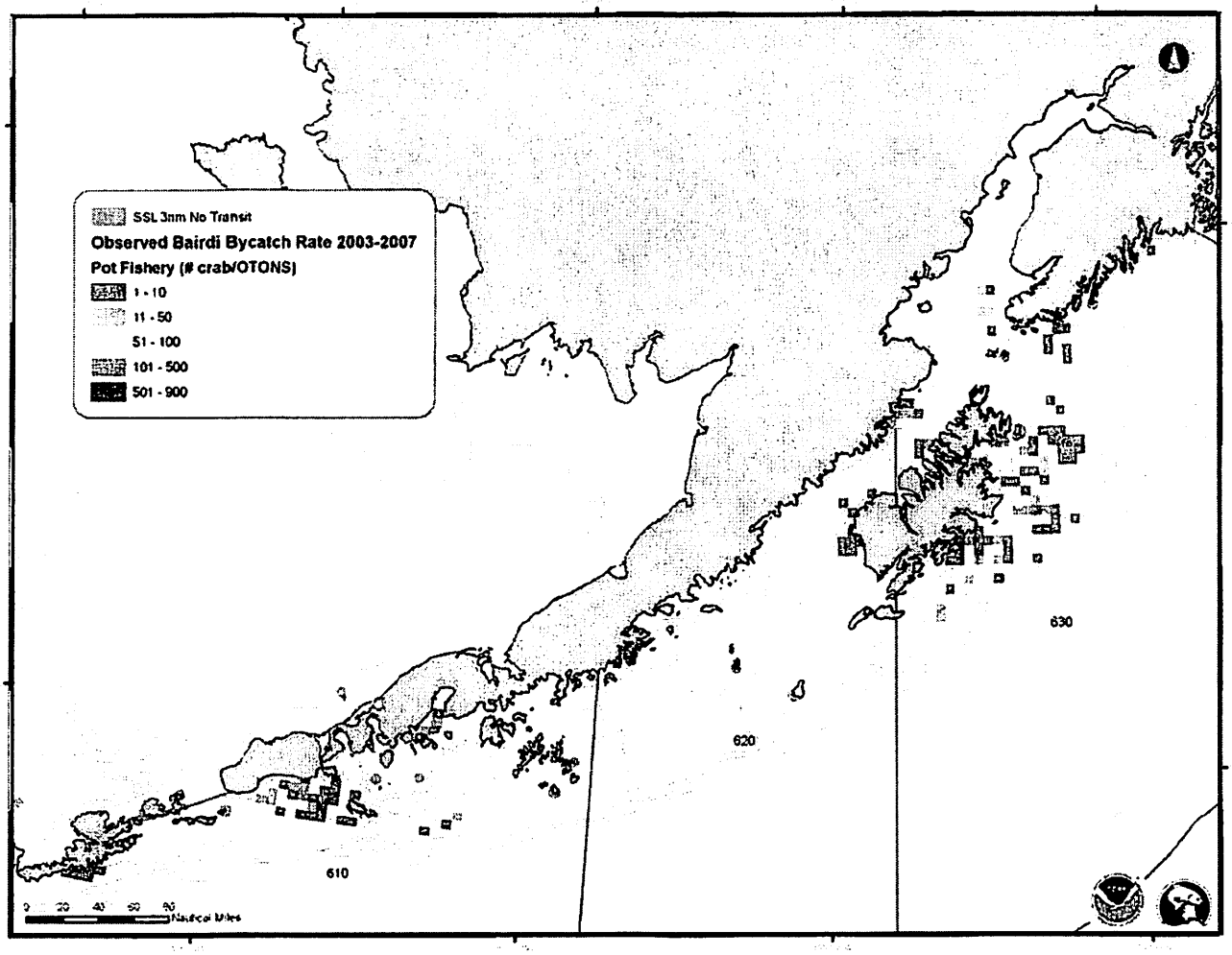


Figure 27 Chinook salmon strawman closures for pelagic trawl gear, based on high incidence of bycatch

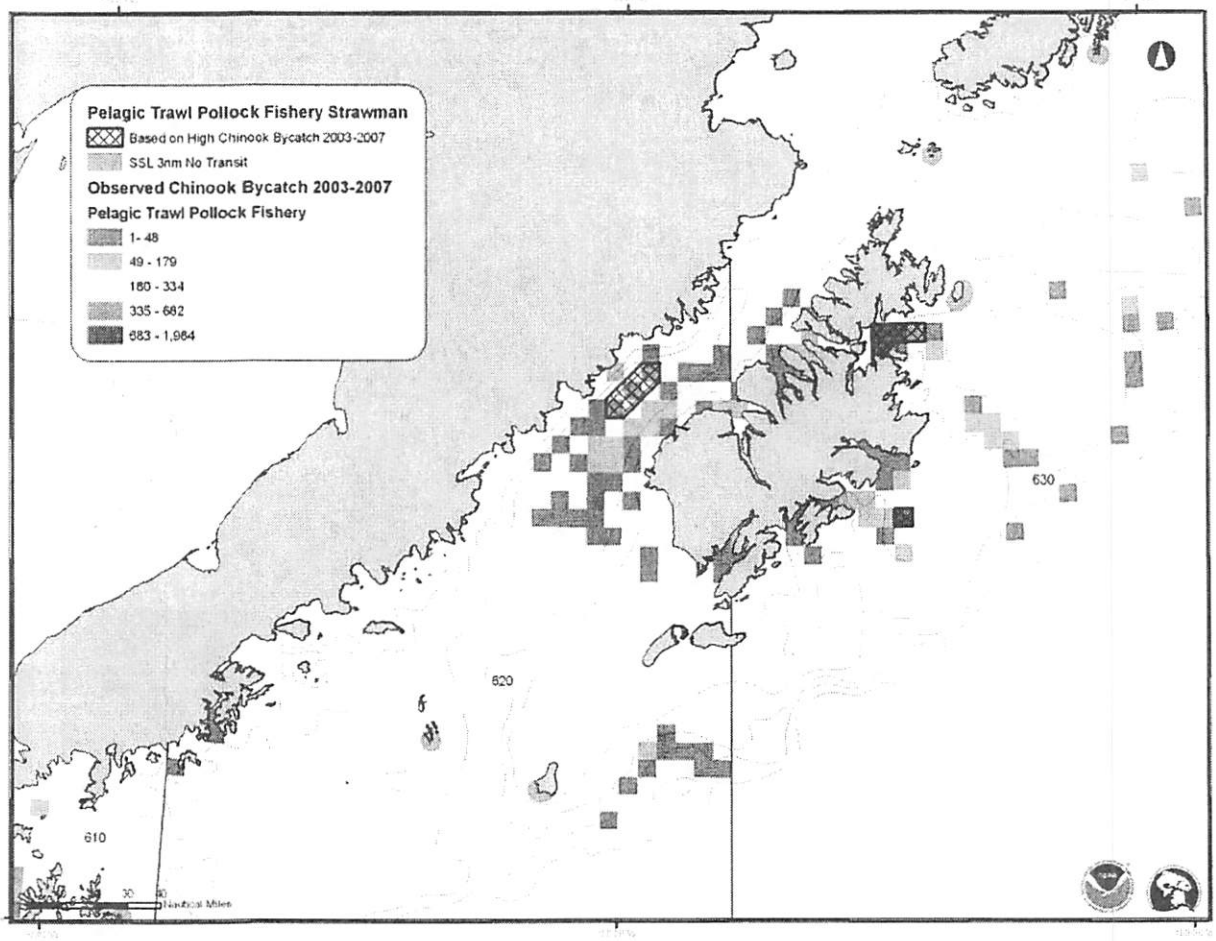


Figure 28 **Chinook salmon strawman closures for pelagic trawl gear, based on high incidence of bycatch, compared to areas with high bycatch rates**

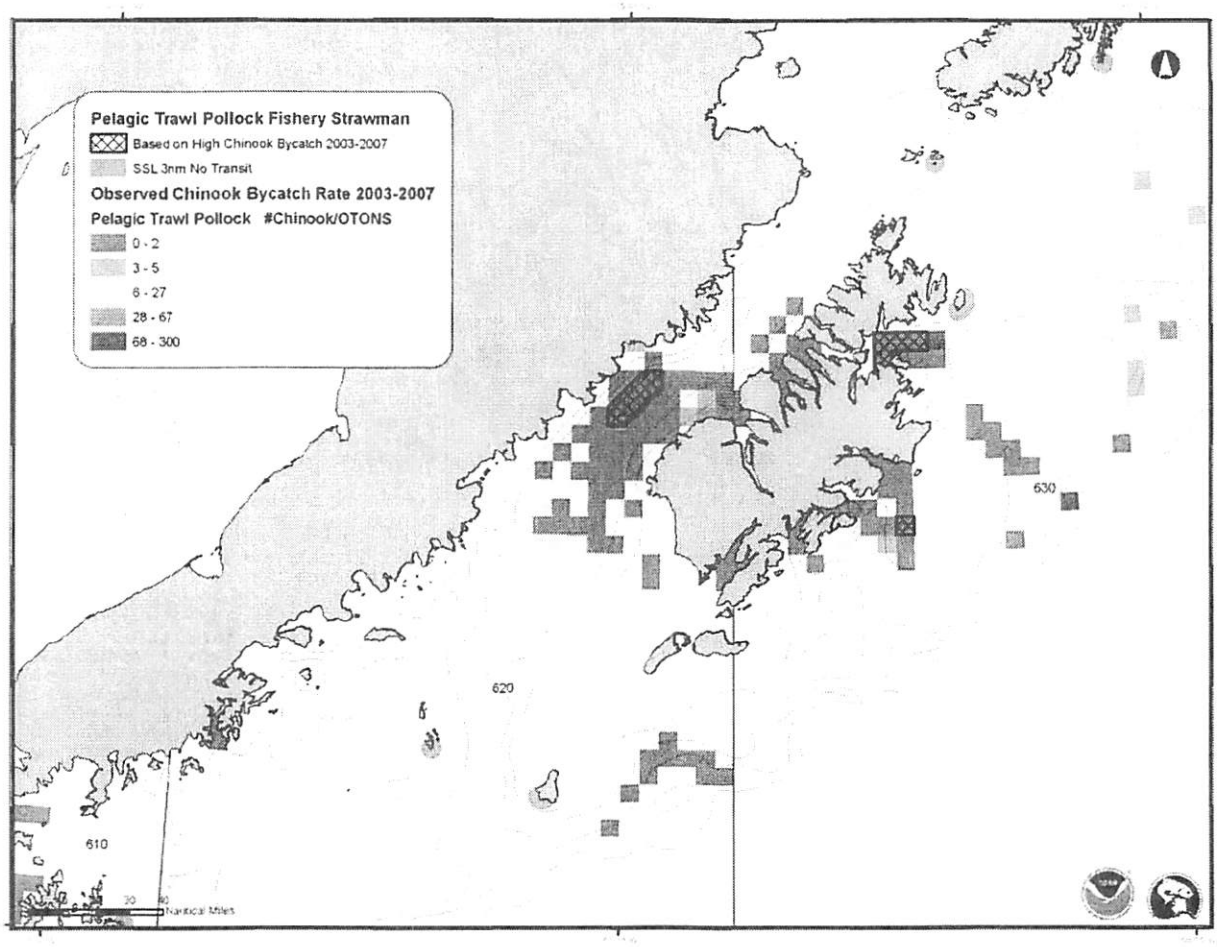


Figure 29 ***C. bairdi*** **crab strawman closures for non-pelagic trawl gear, based on high incidence of bycatch**

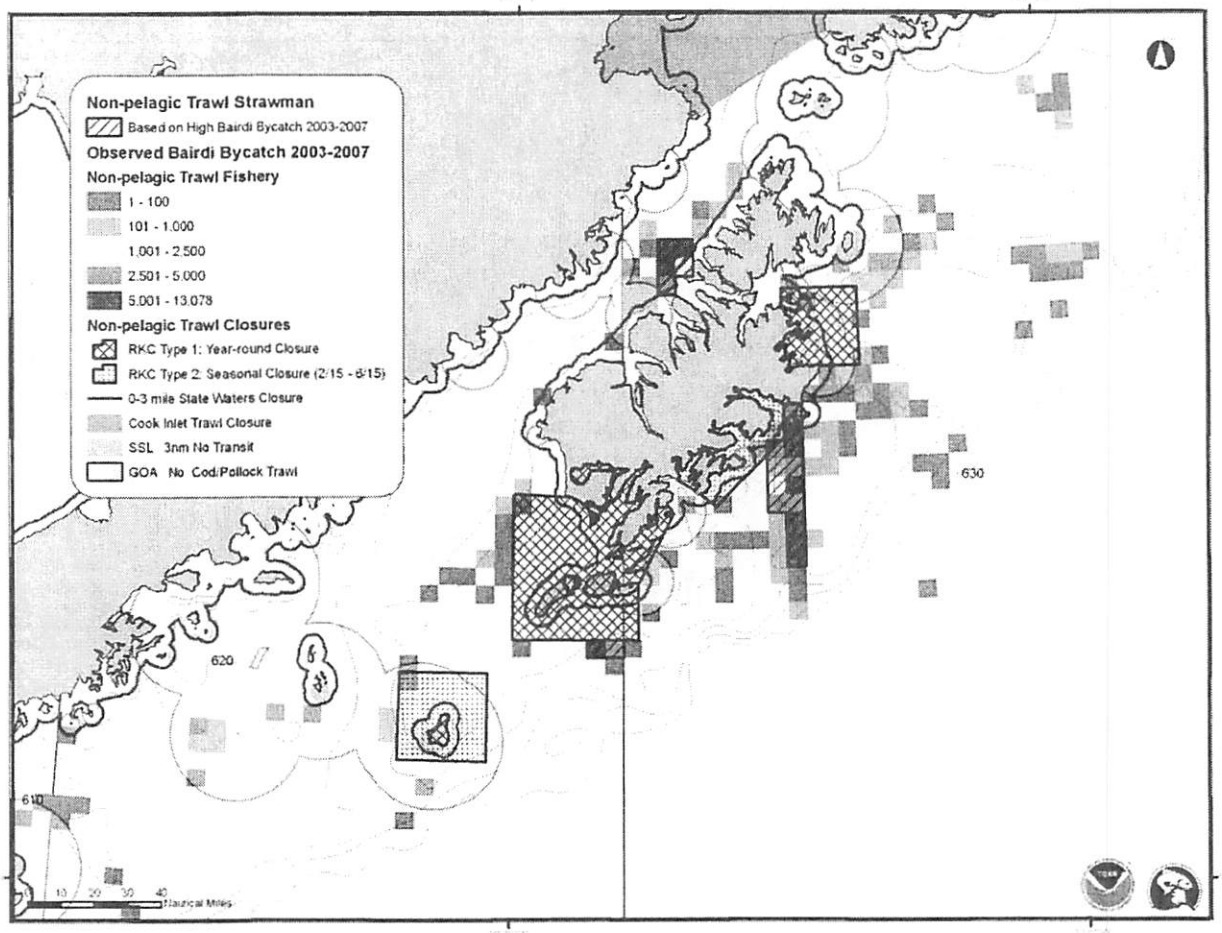


Figure 30 ***C. bairdi*** **crab strawman closures for non-pelagic trawl gear, based on top 10% incidence of crab bycatch, both in observer samples and extrapolated to observed hauls**

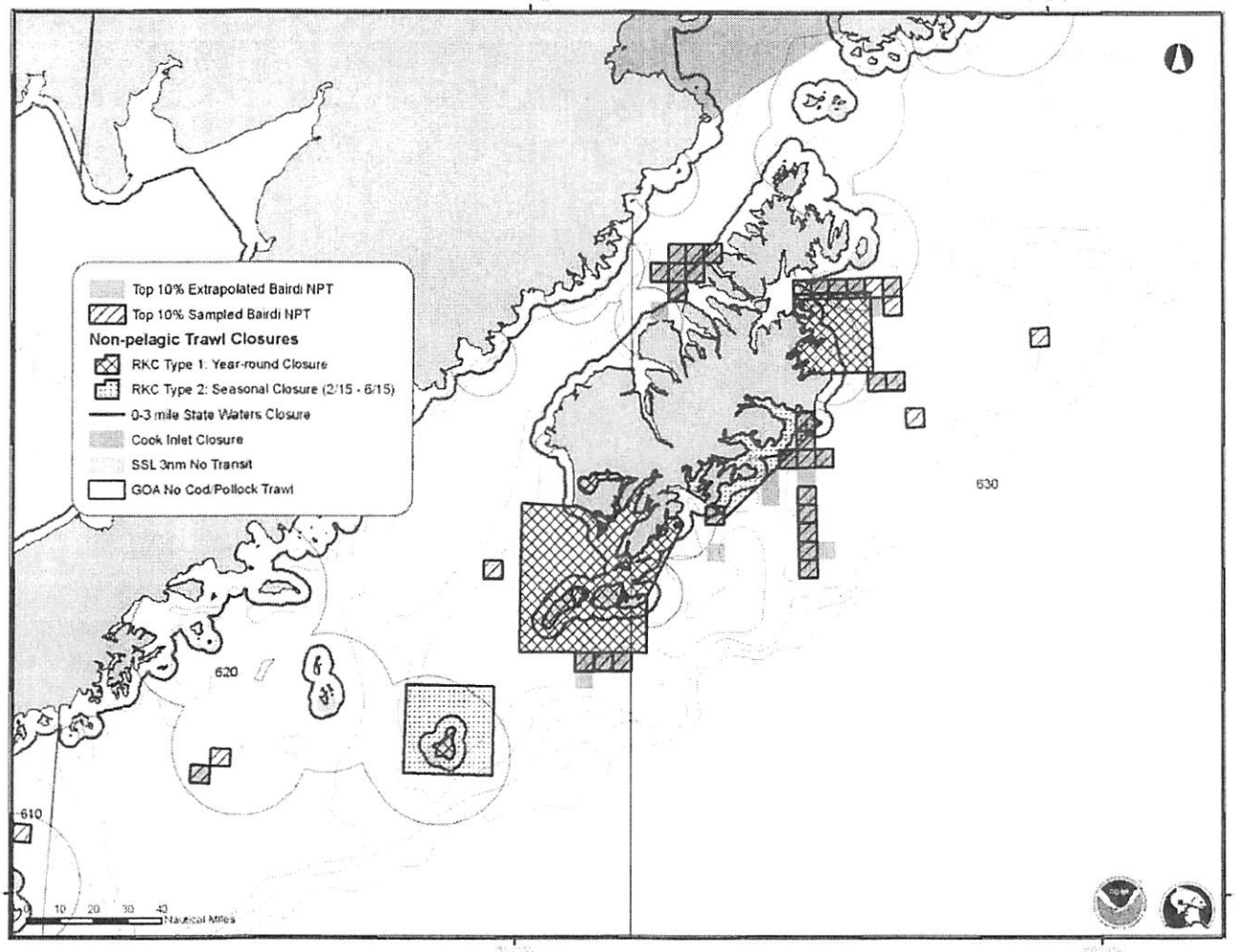


Figure 31 ***C. bairdi*** **crab strawman closures for non-pelagic trawl gear, based on high bycatch rate (number of crab per metric ton of groundfish, averaged for 2003-2007)**

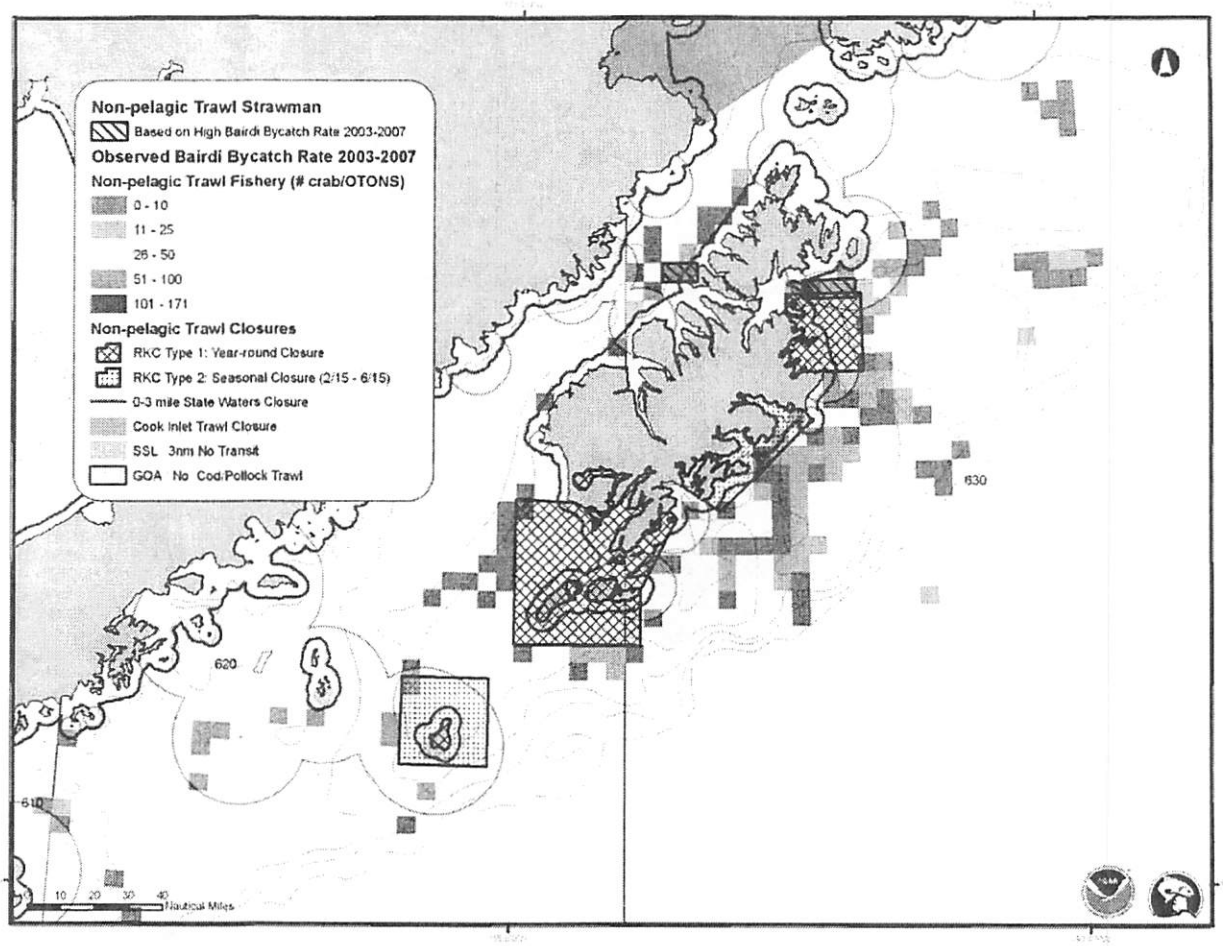


Figure 32 Comparison of *C. bairdi* crab strawman closures for non-pelagic trawl gear, high incidence of bycatch versus high bycatch rate

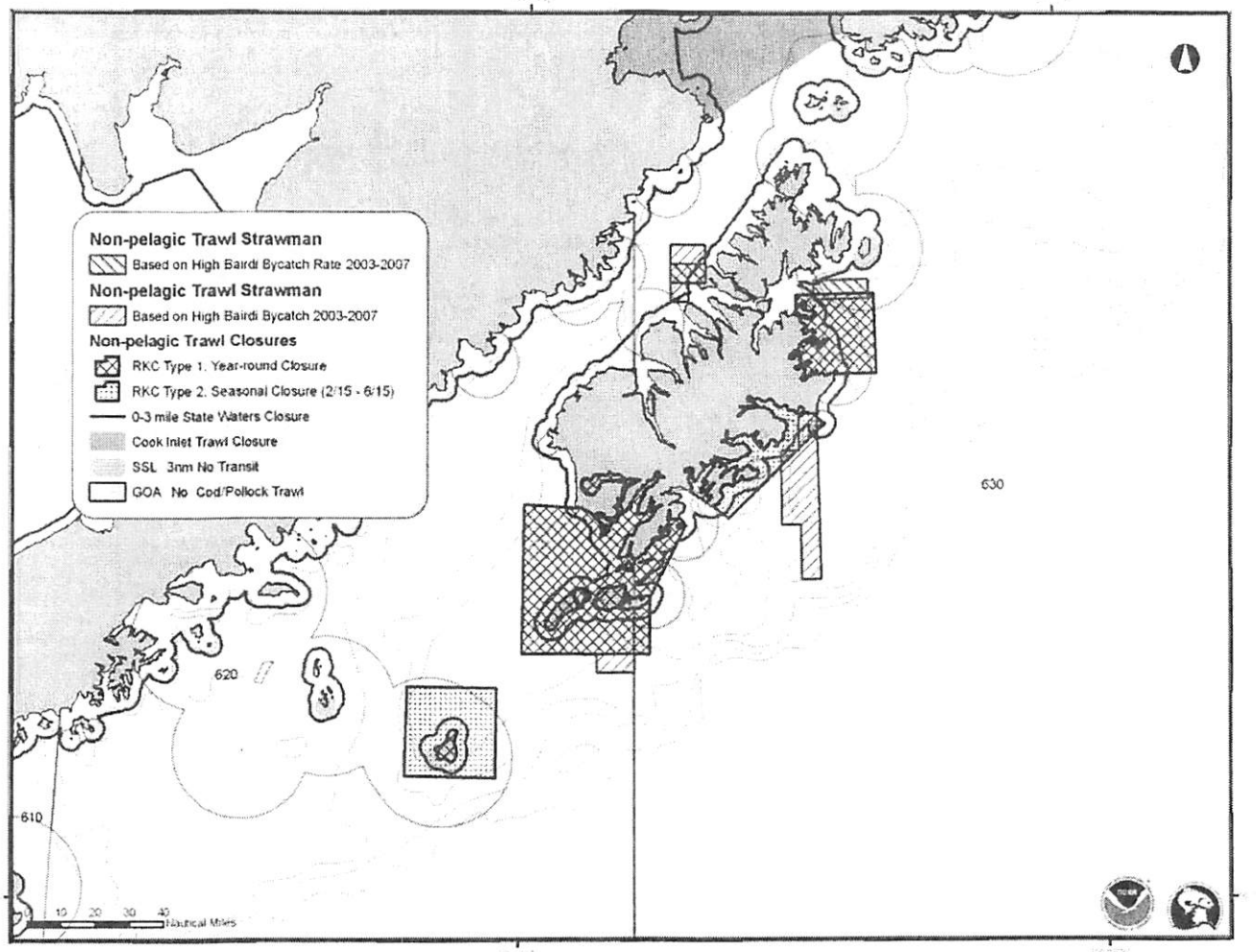


Figure 33 ***C. bairdi*** **crab strawman closures for pot gear, based on high incidence of bycatch**

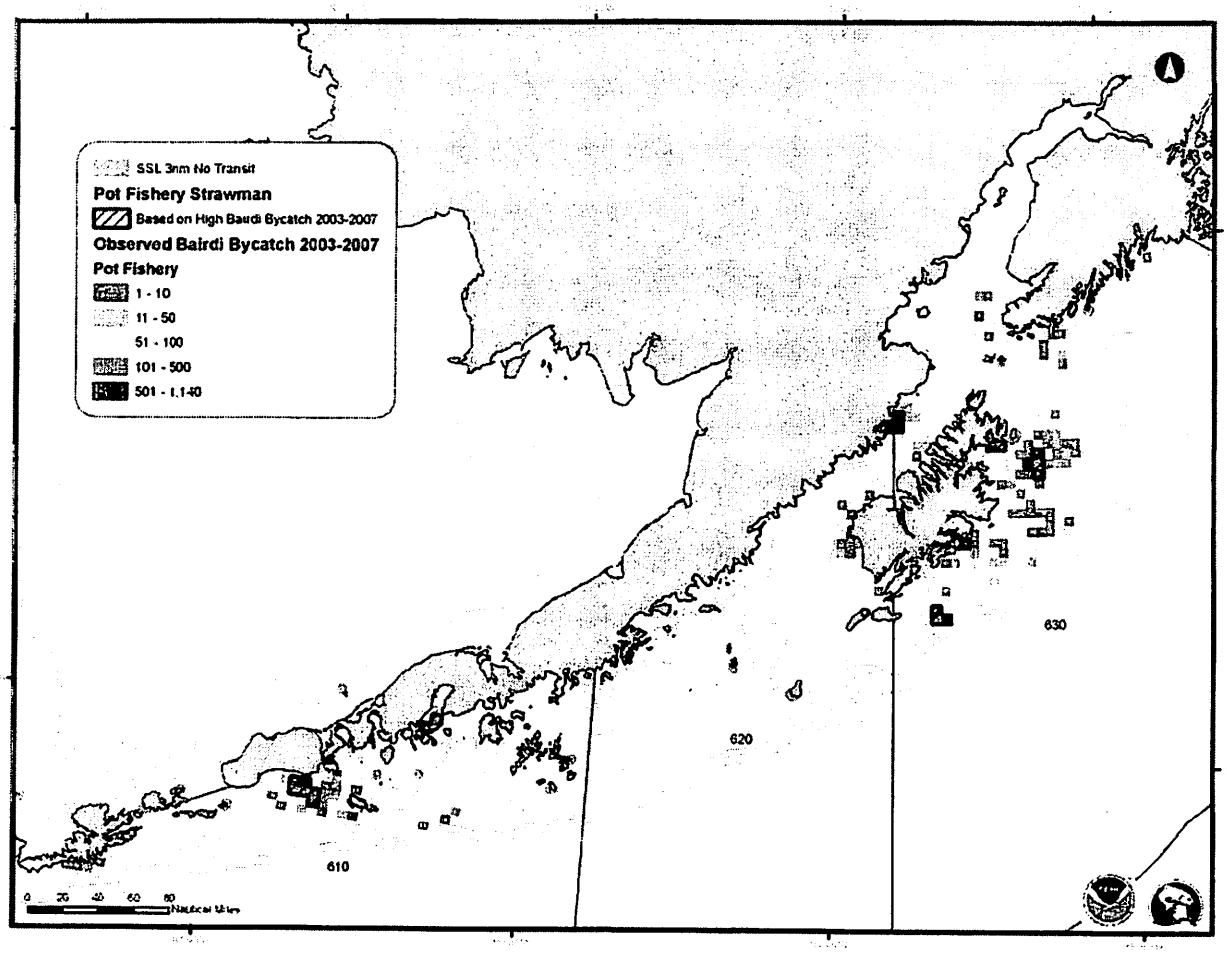
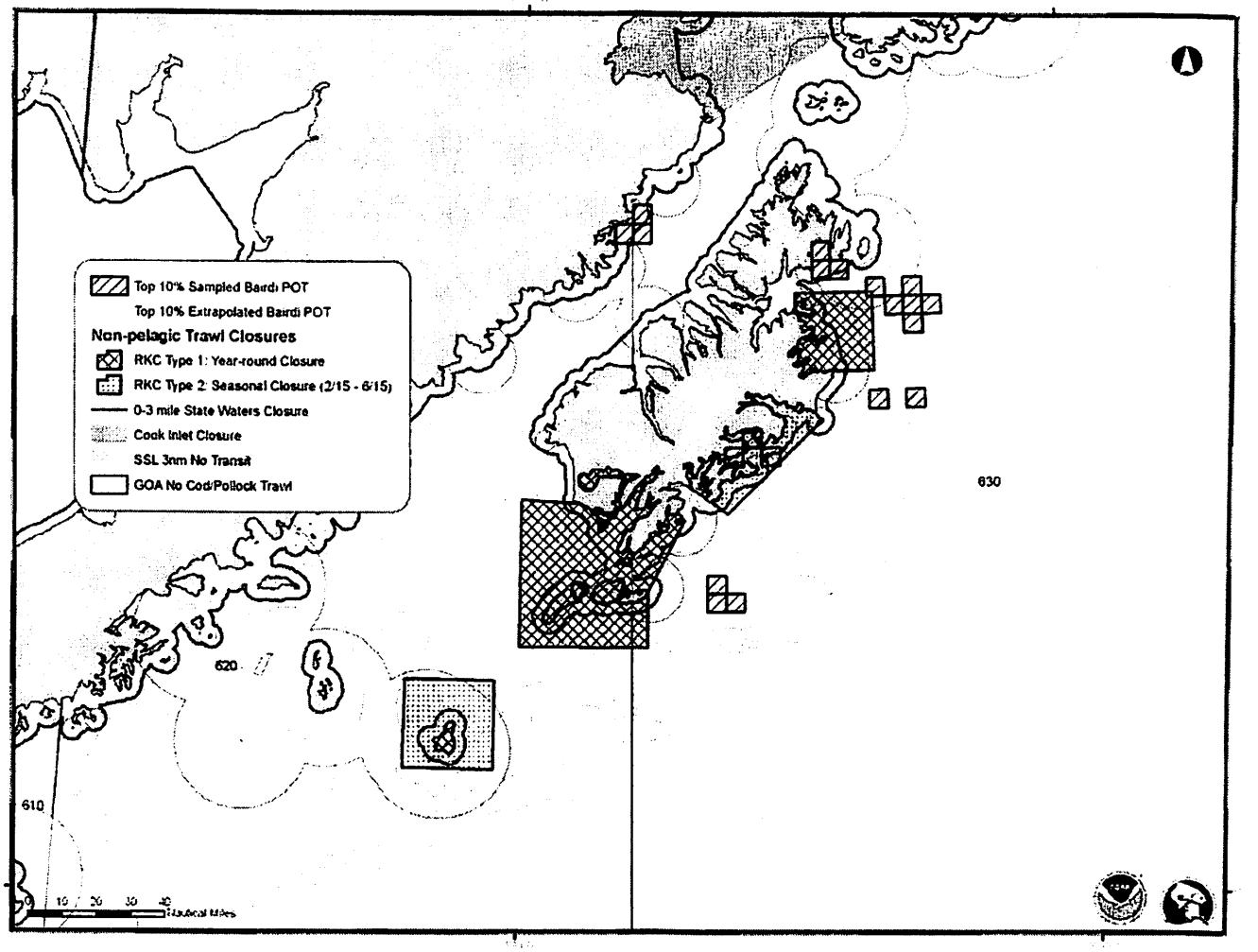


Figure 34 ***C. bairdi*** **crab strawman closures for pot gear, based on top 10% incidence of crab bycatch, both in observer samples and extrapolated to observed hauls**



Alaska Marine Conservation Council

December 3, 2008

Eric Olson, Chair
North Pacific Fishery Management Council
605 W. 4th Avenue
Anchorage, AK 99501

RE: Agenda Item C-3 (d), Chinook salmon and Tanner crab bycatch in the Gulf of Alaska

Dear Chairman Olson,

The North Pacific Fishery Management Council (NPFMC) has been considering the issue of salmon and crab bycatch for several years. In the Fall of 2004 and Spring of 2005, you received letters signed by 100-150 Kodiak Island fishermen urging the NPFMC to take action on this problem. We appreciate the NPFMC's decision last June to go forward with the development of some potential management alternatives.

To date, no bycatch control measures have been implemented for salmon or crab species taken incidentally in Gulf of Alaska groundfish fisheries. We believe bycatch of these species is having an impact on directed fisheries for these species and the bycatch mortality of these species is at a socially unacceptable level. Kodiak Island fishermen are dependent on opportunities to participate in diverse fisheries. This is how we maintain viable businesses that support our communities and families. Salmon and Tanner crab fisheries, along with halibut, sablefish, cod and rockfish, are a mainstay for viable year-round fishermen.

Bottom trawl effort has increased significantly over the last few years in the Central Gulf around Kodiak Island. The greatest increase in the number of days on the bottom is occurring in the fall flatfish fisheries. During this time, the Type 2 closure (established to protect red king crab) from February 15th to June 15th, which is thought to also protect Tanner crab from the high bycatch largely associated with the flatfish fishery, is not in place. While one segment of the fleet is benefiting substantially due to a variety of measures in the use of halibut PSC, the impact on the Tanner crab stocks is virtually unknown.

The total allowable catch for the directed Tanner crab fishery around Kodiak Island for 2009 is 400,000 pounds, down 100,000 pounds from 2008, and down for a fourth

(over)

consecutive year. However, area crab biologists have seen recruitment in the trawl survey data that looks promising for harvest 2-3 years down the line. Present action is needed to encourage stability of future stocks, particularly as the crab move offshore.

We request the NPFMC take immediate action to address long standing salmon and crab bycatch concerns in the central Gulf of Alaska by:

1. Moving forward with a formal analysis of the alternatives in the November 2008 staff discussion paper (Chinook Salmon and C. Bairdi Crab Bycatch in Gulf of Alaska Groundfish Fisheries);
2. Adding an alternative that would require 100% observer coverage for all pot and trawl groundfish vessels 60 feet and over operating in the federal water "strawman" closure areas (illustrated in the discussion paper) for Tanner crab. This alternative would serve to increase scientific data in areas of high bycatch among the fleet that is currently observed.
3. Schedule review of a draft analysis at the April 2009 NPFMC meeting.

Sincerely,

Theresa Peterson
Alaska Marine Conservation Council

F/V HAZEL LORRAINE

02 Center Street
Suite 315-274
Kodiak, AK 99615

Tel: 907-486-7599

Eric Olson, Chairman
N P F M C
6605 W. 4th, Suite 306
Anchorage, AK 99501-2252
Fax 907.271.2817

Albert Geiser
42277 Garrison Lk. Rd.
Port Orford, Oregon
97465

November 24, 2008

Re: BSAI Salmon Bycatch Cap and **30%** Observer coverage

Dear Chairman Olson and members of the Council:

The Hazel Lorraine fishes for pollock in the Bering Sea, with 30% observer coverage. That constitutes a large monetary burden for the vessel and the crew each observed day (plus shared airfare, travel per diem, and debriefing days) including food for the observer are deducted from the gross monthly revenue. Catcher vessels in both inshore and offshore pollock fisheries vary in size and earning potential (harvest share amount), the observer costs are therefore highly variable throughout the fleet at the crew and vessel level. A 90-foot vessel pays the same costs for 30% coverage as a 123-foot vessel with a much larger harvest share. Observer's costs are a **one-size fee that does not fit all** vessels equitably.

As the Council looks at the options surrounding the Salmon bycatch caps for the BSAI, some of the options included 100% observer coverage. That would translate to more than $10,000 per month, putting a huge financial burden on the crew. My fear is that the "safer" fishing environment created by the AFA ending the "race for fish" will give way to a **new race** driven by "observer days"; i.e., fish tougher weather to complete catching the harvest share in the shortest time.

To increase **data for NMFS** from the start of each pollock season from the 30% observed sector, each cooperative by agreement would insure that one in every three 30% vessels start the season with an observer. For example if a cooperative has nine vessels fishing that are less than 125-foot, three vessels would be required to start the season observed. Pollock being a single species fishery and the bycatch is specific (not rare), increased data would allow for **status quo** for the 30% vessels.

Respectfully,

Albert Geiser, Owner

Elizabeth Andrews PhD
USA

Co-Chairs

Frank Quinn
Canada

Yukon River Panel 100-419 Range Road Whitehorse, Yukon Y1A 3V1

November 20, 2008 (sent via fax to 907-271-2817)

Chris Oliver, Executive Director
North Pacific Fishery Management Council
605 West 4th, Suite 306
Anchorage, Alaska 99501-2252

Re: 10-23-08 Letter and Alternatives for Bering Sea Chum Salmon Bycatch

Dear Mr. Oliver:

This letter is in response to your letter of October 23, 2008 confirming the Yukon River Panel's recommendations about chum salmon bycatch management measures for the Bering Sea pollock fishery.

A the Council continues the discussion of chum salmon bycatch management at its December 2008 meeting, we reaffirm our recommendation for an analysis which includes a hard cap between 70,000 and 77,000 non-Chinook salmon. We note that Table 10 of the discussion paper does not include this as one of the cap levels to be analyzed; rather a lower hard cap of 58,000 and a higher hard cap of 201,300 non-Chinook are proposed. Our recommendation is to include an analysis of a cap between 70,000 and 77,000.

In addition, you are correct in your interpretation of our recommendation for an analysis that would combine Alternative 2 (a hard cap) and Alternative 3 (fixed area closures triggered by a cap). Your understanding is correct, that triggered areas would close first and the fleet would be allowed to keep fishing outside of the closed areas until it reached the overall hard cap or the pollock harvest quota. We think this approach is important to analyze to determine whether a combination of the two alternatives could reasonably be expected to effectively reduce bycatch.

Sincerely,

Elizabeth Andrews

Elizabeth Andrews
Co-Chair

Frank Quinn
Co-Chair

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

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

www.worldwildlife.org

December 3, 2008

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

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

Re: Chum Salmon Bycatch D-2 (c)

Dear Mr. Olson and Mr. Mecum,

World Wildlife Fund (WWF) appreciates the opportunity to comment on the BSAI Chum Salmon Bycatch alternatives being considered for analysis by the North Pacific Fishery Management Council (Council). We submit this letter in continued support of salmon bycatch reduction efforts in the Bering Sea and Aleutian Islands (BSAI) pollock fisheries. WWF recommends that the Council expedite the analysis of alternatives for Chum (Non-Chinook) salmon bycatch and other mechanisms to minimize and reduce salmon bycatch in the BSAI pollock fishery and take the urgent action necessary to protect salmon stocks throughout the North Pacific.

Although chum salmon bycatch appears to have retreated substantially this year, this should not be reason for inaction or consideration of diluted measures. Potential and existing threats to BSAI salmon populations, such as changes in climate and marine species distribution, ocean acidification, and planned offshore oil and gas development in Arctic and Bering Sea waters, add to the urgency to further reduce and prevent salmon bycatch. Cumulative effects of these factors on salmon populations, coupled with a lack of a cap on bycatch for BSAI salmon, also could be devastating to North Pacific communities, especially peoples throughout Alaska, Russia, Asia and Canada. Residents of the Pacific Northwest residents, who were dramatically affected by the Pacific Coast salmon fishery shutdown earlier this year, could also experience significant difficulty as a result of excessive BSAI salmon bycatch.

As evidenced by the inattention that led to the highest historical bycatch level of chum salmon in the Pollock fishery in the 2005 season, we cannot simply go back to "business as usual" because chum salmon bycatch is lower this year. Despite the recent reduction in overall salmon bycatch levels, the Council must take decisive action to prevent future excessive bycatch of salmon stocks throughout the North Pacific. WWF supports moving forward the Council's analysis of the appropriate alternatives to reduce chum salmon bycatch. Furthermore, we believe that any alternative should be implemented in a precautionary manner to help ensure healthy chum salmon returns in the future to communities dependent on them.

The Council should also consider that many of the subsistence fisheries throughout Alaska were lower than expected this year, and in many cases substantially lower than historical catch levels. This is especially true for Chinook salmon harvests in many Western Alaska watersheds. Thus, it is likely that subsistence harvest needs for chum salmon will increase in communities affected by lower Chinook harvests. Many salmon fisheries also reported much later harvests compared to historical fishing periods. These variable factors may have had unforeseen and poorly understood impacts on BSAI salmon bycatch levels that emphasizes the need for increased resiliency in the management process. As we have seen with the salmon stocks originating in the lower 48, a lack of resiliency built into the management process can lead to catastrophic results.

WWF continues to support a rigorous analysis of a reasonable range of reasonable alternatives to reduce salmon bycatch while minimizing the economic impact to the pollock fleet. Furthermore, the Council should carefully consider the recommendations of the Yukon River Panel, Federal Subsistence Board, the US Fish and Wildlife Service, the Community Development Quota groups, and the Regional Advisory Councils in considering further measures under this analysis.

In conclusion, WWF again encourages the Council to move quickly to analyze alternatives for Chum (Non-Chinook) salmon bycatch agenda item D-2(c) in order to achieve an effective solution as soon as possible. Most importantly, flexibility in the strategy and alternatives is important to minimize adverse effects on the pollock fishery, but should not preclude decisive action to protect salmon stocks and the communities, commercial fisheries, and subsistence fisheries that depend on them.

Thank you for your time and consideration of these comments.

Respectfully,

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

December 3, 2008

To: North Pacific Fisheries Management Council
6005 W. 4th, Suite 306
Anchorage, AK 99501-2252
Fax: 907-271-2817

From: Mark Chandler
F/V Topaz
11415 S. Russian Creek Rd.
Kodiak, AK 99615

Re: Agenda Item D-2 (d): GOA Salmon and Crab Bycatch

Dear Chairman Olson and members of the Council:

As owner of the Topaz, a Kodiak trawler for the past 28 years I would like to take this opportunity to provide my thoughts on the issue of bycatch in the GOA.

While any regulatory discards are regrettable and should be minimized; the bycatch of Bairdi in the gulf is very small as a percent of the crab population and is not a conservation problem. The Kodiak trawl fleet did negotiate an agreement with the fixed gear fleet to conduct increased monitoring in the area of greatest concern to provide better data on crab bycatch. It is my understanding that at this time the fixed gear fleet has not signed on to move ahead with this program.

We also need a better data set in regards to the bycatch of salmon. The current structure of the observer program does not provide representative data to fisheries managers. I understand a new comprehensive program will soon be implemented in the Bering Sea for salmon bycatch. This new program should help inform decisions on measures for the GOA. The development of a salmon excluder usable by gulf vessels would also be of great value.

However the focus for the NPFMC and NMFS really needs to be on a restructured observer program that will provide representative and timely data. This would make possible much greater industry support for the development of any new bycatch measures that may prove necessary.

Thanks for your consideration.

Sincerely, Mark D. Chandler

YUKON RIVER DRAINAGE FISHERIES ASSOCIATION

December 15, 2008

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

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

Re: Agenda Item D-2(c) Chum Salmon Bycatch

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

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

Chum salmon are an important subsistence resource throughout Western Alaska. Particularly in years of low Chinook runs, as in recent years, chum salmon are a vital source of food. Chum salmon are also an important commercial species with growing markets. While chum returns have been relatively good in Western Alaska in recent years (with the notable exception of Norton Sound), chum returns are highly cyclical, and the trend may change soon. Available data indicates that dependant on location and season, 20-53% of chum salmon are of Western Alaskan origin (Wilmot et. al., 1998). This is a substantial proportion of Western Alaska salmon, particularly in years of high bycatch. The presence of hatchery fish in the chum salmon bycatch along with wild Western Alaska fish does not lessen the urgency of reducing chum salmon bycatch. The Council's obligation is to reduce chum salmon bycatch, and this focus should not be lessened by the presence of hatchery fish.

Since chum salmon returns have been relatively good in recent years, we have the benefit of developing chum salmon bycatch reduction measures now while we are not in crisis mode. We urge the Council to take advantage of this opportunity and move this package forward for analysis. We support including triggered area closures in the analysis, as we simply do not have enough information to exclude them from consideration at this time. If effective in reducing salmon bycatch, triggered closures could be a viable alternative, and thus should not be excluded at this point in the analytical process.

Thank you for your continued efforts on this important issue. We look forward to participating in the Council's development of chum salmon bycatch reduction measures

Sincerely,

Rebecca Robbins Gisclair
Policy Director

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

D-2

December 3, 2008

NPFMC Board of Directors

I am Paul Beans from Mountain Village, Alaska. I commercial and subsistence fish on the Yukon River. Thank you very much for the opportunity to testify before you once again. I appreciate it very much.

The 2008 summer subsistence and commercial season the Yukon River has come and gone. As we all know it was a very disappointing season commercially and a limit was in place on Subsistence Fishing for King Salmon y1 through y6 this past summer. We live and depend on the Yukon for our subsistence needs for centuries. We have fished commercially for many years and this year is a disaster year for us. Mountain Village drew up a joint resolution to our Governor to declare a state of ~~emergency~~ Economic Disaster on the Yukon for not Targeting King Salmon during the 2008 Commercial season. We have not heard anything on this resolution at all to date from our Governor Sarah Palin and our Senators for the State of Alaska. We anticipate that 2009 will be very similar to 2008 salmon run. We need help on the Yukon and nobody is turning their head to help us out.

Chinook bycatch by the Pollock Fishery in recent years has increased to the point where it is hurting Commercial, subsistence, and escapement goals in the salmon terminal rivers in western Alaska. Mountain Village is one of the Villages along the Yukon that is concerned for the future of our returning salmon each year. It is uncalled for to place a limit on subsistence activity along the Yukon for Chinook salmon, when bycatch of our Chinook and chums can be prevented in the Bering Sea Pollock Fishery. A reduction of subsistence time was in place for the 2008 salmon season. Salmon Bycatch must have a reasonable cap to prevent further dissemination of this valuable resource for the people of the Yukon River.

There is an article in the Anchorage Daily News dated December 2, 2008 regarding the Federal Scientists placing a Pollock Harvest level of 815,000 tons. Greenpeace on the other hand wants a cap of 458,000 tons. Out in the ocean Pollock must be a food source for animals that live out there. There is no mention of Chinook or Chum bycatch at all in this article. We are concerned of too many of our returning salmon being taken out there before they enter our Yukon River by the Pollock Fishery. Before a high limit of 815,000 tons is placed on the Pollock Fishery, there should be considerations on what the Salmon bycatch out in the Bering Sea Pollock Fishery is hurting in the terminal rivers where the Salmon enter to spawn, like the Yukon River. It is hurting the subsistence and commercial fisherman.

Thank you very much

Paul Beans

Paul Beans

D-2(c)

December 16, 2008

To: The North Pacific Fishery Management Council

From: Kawerak, Inc., Julie Raymond-Yakoubian

Re: Chum Bycatch Management in the Pollock Trawl Fishery

Mr Chairman and Council Members,
Kawerak would like to restate our concerns over Government-to-Government consultation in general and consultation as relates to Chinook and Chum Bycatch Management. We would like to urge the North Pacific Fishery Management Council (NPFMC) to recommend to the National Marine Fisheries Service (NMFS) that they develop a formal Government-to-Government consultation policy and protocols. As we have noted elsewhere, a formal, accountable process is needed to ensure that tribal concerns are identified as early as possible and that they are given proper consideration.

NMFS has begun consultation on the Chinook Bycatch EIS at the request of several Kawerak region tribes. However, NMFS seems quite resistant to developing any formal guidelines, such as other federal agencies have done, and as is required by Executive Order 13175.

In terms of the upcoming Chum Bycatch EA or EIS, consultation has not yet begun. The fact that NMFS and the NPFMC know that a NEPA review regarding Chum Bycatch is upcoming, and the fact that discussion papers are being written, and meetings have been held, indicate that consultation should have already begun. As the Council is aware, chum salmon are an important subsistence resource for Kawerak region communities.

Though NMFS is responsible for carrying out Government-to-Government consultation, they have also admitted that the Council essentially makes decisions on behalf of them. Because of the relationship between NMFS and the NPFMC, we believe that the Council should be intimately involved in the consultation process, starting now.

Our communities cannot reasonably be expected to suffer through additional seasons of drastically decreased runs and highly restricted subsistence salmon fishing. These are runs that have significantly decreased, at least in part, because of pollock trawling bycatch. The Council and NMFS know that trawling is having an impact on subsistence salmon fishing and you have a legal and moral responsibility to reduce and mitigate those impacts.

The clear focus of the Chinook Bycatch EIS on the financial health of the pollock fishing industry over the psychological, physical, cultural, and economic health of the indigenous communities of Western Alaska is unacceptable. While an important fishery for Alaska and the nation, it should not eclipse the health of our communities. I encourage the Council and NMFS to make a more comprehensive and detailed examination of the impacts of bycatch on coastal village communities and their subsistence lifestyle in the chum bycatch analysis.

I would also like to state that we believe it is inappropriate to revise the chum options at this point when NO tribal consultation has been completed on this issue. Tribes should be able to contribute to discussion and ideas for alternatives. I would also add that the onus is on the agency to make sure (and not just through a letter) that tribes know what is going on, that they can participate, and that they can do so with the assistance of the agency.

Thank you for your time and consideration of our comments.