AGENDA C-1(c)
FEBRUARY 2004

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

DATE: January 26, 2004

SUBJECT: Gulf of Alaska Groundfish Rationalization

ESTIMATED TIME
16 HOURS
all C-1 items

ACTION REQUIRED

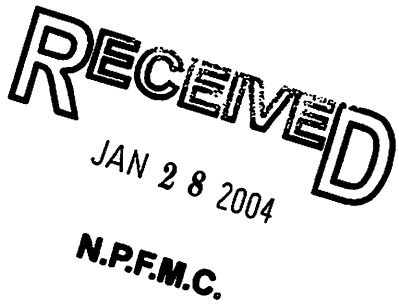
Review staff paper on salmon and crab PSC

BACKGROUND

A staff discussion paper reviewing salmon and crab bycatch in the GOA and suggesting potential alternatives for bycatch limits was presented to the Council in October 2003. At that time it was requested that staff expand upon the preliminary paper to include additional data, information and alternatives. This expanded discussion paper will be handed out on Monday morning as C-1(c)(1). Staff will provide a summary.

AGENDA C-1
Supplemental
FEBRUARY 2004

Crewmen's Association
Steve Branson
Box 451 Kodiak AK
99615



1/28/04

Crewmen's Resolution on GOA Rationalization

The Crewmen's Association represents just shy of 200 deckhands who fish Alaska's waters. This is but one percent of the crewmen in the state, but our numbers are rapidly increasing as people realize the implications of the privatization of our public resource. With 20,000 active crewmen in Alaska, we outnumber all other players in the game combined.

It is our profound hope that the Council will include the working fishermen in the division of resource harvest rights, keeping the crew profitably employed in their traditional industry is the best community protection we can think of. Implementation of IFQ in the longline fishery was devastating to many crewmen and had a detrimental effect on the coastal communities in Alaska.

The following is a list of suggestions is aimed at making the division of resource rights fair and equitable to the majority of the people involved in harvesting Alaska's most valuable resource.

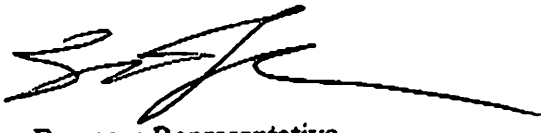
1. 21% of harvest rights be awarded to crewmen traditionally participating in the specific fishery. A. Crew harvest shares to be transferable only between deck hands.
2. Exclusive rights to the deck jobs are ensured to traditional crewmen, much as the harvest rights are exclusive to IFQ holders and limited entry permit holders. In the case of fleet, hence deck job reduction, crewmen would need to purchase deck rights from one another to continue participation. This would at least partially reimburse the crew displaced by the reduction of jobs.
3. Mandatory continuance of traditional deck percentages for each specific fishery; 5% or so for crab, 8-11% for trawl, 7-10% for longline, etc.
4. The loan program be made more accessible to lower income fishermen by reducing the down payment amount.
5. Any buyback program includes funds to reimburse deckhands for the loss of lively hood due to governmental action. After all, the BSAI crab buyback program will no doubt be partially paid for by crew when it's extracted from the boat gross of remaining vessels

6. Any co-op that reduces the number of deck positions be required to compensate displaced crew, much as co-op boat owners not fishing their vessels receive a cut of the profits.
7. These resolutions be applied to the BSAI Crab Rationalization plan as well as any new privatization plans.

Hopefully these ideas will keep our fishermen working, our communities strong, and the distribution of resource rights balanced to support as much of the traditional infrastructure as possible.

The Crewmen's Association also supports the proposals of the Deep Sea Fishermen's Union, Gulf Groundfish fishermen's Association, and Terry Haines.

Thank you for your consideration



Steve Branson; Representative
Crewmen's Association

January 28, 2004

North Pacific Fishery Management Council
Stephanie Madsen, Chair
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252
Phone: (907) 271-2809 Fax: (907) 271-2817

RE: Gulf of Alaska Groundfish Rationalization

Dear Madam Chair:

I own and operate two vessels that participate in the Gulf of Alaska pacific cod fishery, and I would like to comment on several aspects of the GOA rationalization alternatives that are currently under consideration. I fish p-cod using both pot and longline gear, and both of my boats are based in Kodiak. My concerns are itemized below for your persual.

- *Leasing (2.2.3.3.5 of Staff Annotated Elements and Options).* I support allowing some form of leasing of GOA groundfish quota. Allowing leasing would impart a great deal of needed flexibility to quota share owners who are unable to fish their quota themselves in a given year. I have experienced great frustration with the leasing restrictions in the halibut and sablefish programs, so I would urge the council to permit leasing in the groundfish program. If the council intent is to select a preferred leasing option at this meeting, I support the selection of option 2, or if that is deemed to be too unrestrictive, then option 4 would be acceptable.

- *Owner-on-board requirements (2.2.3.3.7).* I believe that original issuees should have a permanent exemption from any owner-on-board requirements for original issue quota shares. Many boat owners who will receive QS in the initial allocation do not themselves fish any longer. To force them back on board immediately after allocation or after 5 years would be unfair.

- *State waters parallel fishery (2.2.2.3).* I think it is important not to eliminate the state waters parallel fishery. The parallel fishery provides an avenue for many local fishermen, especially those with smaller boats, to participate in the federal pacific cod fishery. Eliminating the parallel fishery is unnecessary and would complicate p-cod harvests by forcing fishermen to fish beyond 3 miles when harvesting the federal TAC. I support the selection of option 3 as a viable method of integrating state and federal jurisdictions for the harvest of the federal TAC.

- *Alternative 2C.* I cannot support the inclusion of alternative 2C in the GOA rationalization program. This alternative strikes me as being an extreme form of processor protection that is excessive and absolutely unnecessary. I recognize that the council is mandated to protect processor interests. However, this alternative does much more than that—it gives a great *gain* to the processing sector at the *expense* of the harvesting sector. Coupled with a potential allocation for community protection, this alternative would allocate to harvesters significantly less than their historical catch. Regionalization with a closed processor class seems to me to be enough protection to allow processors to maintain their historical processing levels. I urge the council to eliminate alternative 2C.

- *Preferred alternative.* At this time, I support the selection of alternative 2 Low and 2 High A for the fixed-gear sector. As discussed above, alternative 2C is unfair to harvesters. I believe that regionalization coupled with a closed-class (or license limitation) for processors provides enough processor protection; processor linkages are unnecessary and would diminish the flexibility harvesters need to efficiently prosecute the fisheries. Alternative 2 High A is fair to both harvesters and processors, provides incentives for cooperative formation, and seems to be the most workable of the alternatives currently before the council.

Thank you for your consideration.

Sincerely,

Patrick J. Pikus

Patrick J. Pikus
P.O. Box 2843
Kodiak, AK 99615
Phone: (907) 486-5258

Groundfish Forum

4241 21st Avenue West, Suite 200
Seattle, WA 98199
(206) 213-5270 Fax (206) 213-5272
www.groundfishforum.org

January 28, 2004

Ms. Stephanie Madsen
Chairman
North Pacific Fishery Management Council
605 W. 4th Ste 306
Anchorage, AK 99501-2252

Re: Agenda Item C-1: Gulf of Alaska Groundfish Rationalization

Dear Madam Chair,

Groundfish Forum is a consortium of 'head and gut' factory trawlers operating in the Bering Sea, Aleutian Islands and Gulf of Alaska. Many of our members are active in Gulf of Alaska fisheries, and most have history there. We have been closely monitoring the development of elements and options, and have been involved in the process as much as possible.

We are concerned that package continues to have elements with are particularly harmful to catcher-processors. As the staff analysis points out, decisions on these elements will involve a policy call on the part of the Council as to whether you intend to remove CPs from the Gulf altogether. We encourage you to address this issue very clearly, as it has serious implications for many fishermen.

In particular, Alternative 3 re-introduces the option of including meal as 'retained catch' for the purposes of calculating catch history (section 3.3.2.2, Option A). This issue was discussed at great length over the past two years because it creates inequity between those vessels which have access to meal plants (primarly CVs) and those who do not (primarily CPs). It also rewards the practice of loading up on fish that will go to meal as ballast for more valuable species. The AP and the Council agreed that meal would NOT count toward catch history. We are very disappointed to see that it is again part of the package for analysis.

We recommend that the part of section 3.3.2.2 which addresses calculation of GH be re-written as follows:
"Individual GH will be based on either:

Option A: Retained catch, including catch that is used for meal production, for catcher vessels and total catch, including discards, for catcher-processors.

Option B: Retained catch, excluding catch that is used for meal production."

This is the only equitable way to assign catch history, and is it the method that was already agreed to prior to December 2003.

Thank you for the opportunity to comment. We look forward to continuing to work closely with the Council to develop a fair and equitable rationalization program for the Gulf of Alaska.

Sincerely,

T. Edward Luttrell
Executive Director

GULF GROUNDFISH FISHERMENS ASSOCIATION

326 COPE STREET

KODIAK, ALASKA 99615

PHONE: (907) 486-5558

island1@ptialaska.net

January 28, 2004

North Pacific Fishery Management Council

605 West 4th, Suite 306

Anchorage, Alaska 99501

Dear, NPFMC
The position of the Gulf Ground Fish Fishermen's Association is: We as skippers and crew must be included in any form of a rationalization plan that NPFMC comes up with.

By privatizing our nations fishery and omitting skippers and crew, NPFMC is putting a large portion of us out of work and the rest of us left, end up paying for the right to catch the fish that we have traditionally harvested in the first place. As a Council we feel that your job is to set some sort of framework in place to protect us. Owners seem to be very well protected. First IFQ'S or CO OP's are set up, Then a buy back of vessels seems to follow.

NPFMC has left us hanging in the wind as far as any sort of protection goes. Wherever rationalization takes us, NPFMC should not forget that a very large user group is being swept away. We have been instrumental in any of the harvesting of all our nations fish, and for this reason alone we should be at the forefront your thoughts, and not a trailing amendment.

Thank you, Alexus Kwachka

F/V SYLVIA STAR
Ron & Julie Kavanaugh
PO Box 3890 Kodiak, AK 99615
Home(907) 486-5061
Fax (907)486-1496
Email sylstar@ptialaska.net

The following comment is in regards to the rationalization of the ground fisheries in the Gulf of Alaska. It is imperative that the council consider the social and economic impact on coastal communities as a result of the gross consolidation in the wake of the Gulf Rationalization Plan.

We ask the council to support the Qualifying Years, '95-'02, Drop 1. This preserves the traditional make-up of the fishery.

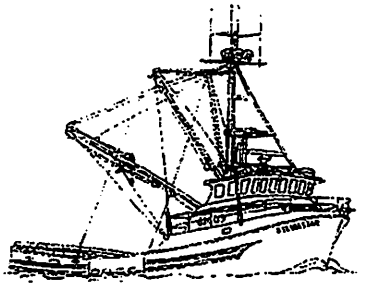
The Council must not support any action tying Harvester to Processors. This is not justifiable...nor is it wanted or needed.

"Secondary Species" should be individually allocated and transferable only with the "Primary Species".

We do not support the retention of halibut (PSC) by-catch outside of the stated commercial halibut fishery. This puts IFQ holders participating in the rationalized ground fisheries at an advantage market-wise

We would ask the council to consider sector splits in the interm.

Ron & Julie Kavanaugh
FV Sylvia Star
PO Box 3890 Kodiak Ak 99615
907-486-5061
sylstar@ak.net



C-1c

February 2004 Staff Discussion Paper

Salmon and Crab Bycatch Measures for GOA Groundfish Fisheries

INTRODUCTION

The North Pacific Fishery Management Council (Council) has adopted measures over the years to control the bycatch of some species taken incidentally in groundfish fisheries (Witherell and Pautzke, 1997). Bycatch control measures have been established in the Bering Sea and Aleutian Islands trawl fisheries for chinook salmon (*Oncorhynchus tshawytscha*), 'other salmon' (consisting primarily of chum salmon, *O. keta*), Pacific herring (*Clupea pallasi*), Pacific halibut (Hippoglosses stenolepis), red king crab (*Paralithodes camtschaticus*), Tanner crab (*Chionoecetes bairdi*), and snow crab (*C. opilio*). Halibut bycatch limits and bottom trawl closure areas to protect red king crab have also been established for Gulf of Alaska (GOA) groundfish trawl fisheries (NMFS 2003). To date, no bycatch control measures have been implemented for salmon or other crab species taken incidentally in GOA groundfish fisheries.

In October, the Council tasked staff to expand upon a preliminary analysis on options for salmon and crab bycatch measures in the GOA to include a discussion of 11 specific points as outlined by the Council (see attached 10/03 Council motion). In this paper, we provide a general overview of the available information on salmon and crab bycatch, with a specific emphasis on those details (as information was available) requested by the Council in October.

METHODS

Catch and bycatch data were provided by the NMFS regional office and the groundfish fishery observer program, and examined to gain insight into the amount, species composition, timing, and location of salmon and crab caught incidentally in GOA groundfish fisheries. NMFS catch statistics for years 1990-2002 for salmon and crab bycatch were summarized annually by each groundfish trawl fishery, with some additional information summarized for bycatch of crab species in the groundfish longline and pot fisheries. Additionally, the amount of bycatch was reported by both a weekly and quarterly period to determine any temporal aspect to the bycatch rates for the fisheries with the highest bycatch. Average amounts of bycatch for multiple years and for percent contribution by individual fisheries were calculated with equal weighting given to each year utilized. No attempt was made to weight individual years higher than others. The observer data represented all trawl catch for a given year, and was queried to produce bycatch of observed hauls by target fishery. Specific locations of salmon and crab bycatch were input into a GIS to produce charts of catch locations.

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, with 30% coverage required on vessels 60 ft to 125 ft , 100% coverage on vessels larger than 125 ft, and 100% coverage at shore-based processing facilities. There are no observer coverage requirements for vessels less than 60 ft. Observer data provide for accurate and relatively precise estimation of groundfish catch, particularly on fleets with high levels of observer coverage, such as the Bering Sea walleye pollock fishery (Volstad et al. 1997). However, the precision of salmon bycatch estimates depends upon the number of vessels observed and the fraction of hauls sampled within vessels (Karp and McElderry 1999). For Bering Sea fisheries such as walleye pollock, a high percentage of hauls are sampled so fleet wide estimates of

salmon bycatch are considered to be reasonably accurate for management purposes (NPFMC 1995a, 1995b, 1999). For Gulf of Alaska fisheries, observer coverage may be lower in some target fisheries due to the prevalence of smaller vessels in the GOA fishing fleet than the Bering Sea. Over the past ten years, there has generally been an increasing level of participation by smaller vessels in the GOA groundfish fisheries, particularly trawl and fixed gear catcher vessels less than 60 ft (NPFMC 2003). Therefore, it should be noted that estimates of salmon and crab bycatch in GOA fisheries may be less precise than estimates of bycatch in Bering Sea fisheries.

Catch accounting:

Data from observed vessels are utilized to determine prohibited species catch (PSC) rates when sufficient data are available. The PSC rate is the weight or number of animals per metric tons of groundfish; salmon are calculated by number. All shoreside processing with the same gear, target, and area, use an average PSC rate for all observed catcher vessels with the same gear, target, and area. An observed catcher/processor uses the rates from the observer on the vessel. An unobserved catcher/processor uses a PSC rate from observed vessels in the same area and target fishery using the same gear type. The smaller vessels (under 60 ft) with no observers, and those that only require 30 % observer coverage utilize rates calculated based on the best data available. The first choice is to use one of four different types of "three week average rates" for the same week, reporting area, gear and target. Three of the four types are sector rates that use either observer data from catcher vessels delivering to shoreplants, catcher vessels delivering to motherships or data from catcher processor observers. The sector rates are used and applied to unobserved catch from the corresponding sector if a sufficient number of observer reports are available. The fourth rate combines data from all catcher vessels and catcher processors observers. The combined rate is used only if a insufficient amount of observer data exists to be able to use one of the three sector rates. If one of the four different types of "three week average" sector rates do not have sufficient observations, a substitute rate based on data from prior years, in the same reporting area, gear and target may be used as the second choice. If that is not available, the third choice is for GOA and BSAI annual average year rates using the same gear and target.

Once the PSC rate has been determined, the PSC estimates are computed by multiplying the rate for each prohibited species times the total groundfish weight for the processor from the groundfish catch accounting system. Key information including week, reporting area, gear and target are used to match PSC rates with the groundfish catch.

Several improvements were made to the catch accounting system in 2003 which include computing PSC rates daily instead of weekly. Observed catcher vessels also now use the rates from the observer on the vessel rather than an average PSC rate for all observed catcher vessels applied to the shoreside processor data with the same gear, target, and area. Although this data methodology isn't as accurate as having an observer onboard 100% of the hauls on all vessel sizes, it is repeatable and uses the best known information. (NMFS, AKR, Mary Furuness personnel communication).

Mortality Rates:

Gear specific mortality rates for crab species have been calculated as 8% for pot gear, 80% for trawl gear, 37% for longline gear, and 40% for scallop dredge gear (NPFMC 1995). Estimates for trawl caught king crab range from 2-81%, while Tanner crab mortality estimates from trawl gear range similarly from 12-82% (Table 1) (Alverson et al. 1994). Mortality studies for crab which did not

distinguish between species estimates trawl mortality rates of 50-100%. Longline mortality rates for crab (no species distinguished) in the GOA range from 0-50% (Alverson et al. 1994).

Salmon mortality rates are also highly variable both by gear type and for different size salmon(Table 2). Legal-size chinook salmon caught in troll gear have an estimated mortality rate as low as 8%, while longline gear mortality rates have been estimated to be as high as 100% (Alverson et al. 1994). For the purpose of this analysis it is assumed that the full bycatch of salmon has a 100% mortality rate within the longline and trawl fisheries.

RESULTS

Salmon Bycatch

The following section provides updated bycatch information for salmon in the GOA. A more detailed report on salmon bycatch in Alaska groundfish fisheries is provided by Witherell et. al (2002).

Amount of Bycatch

Pacific salmon, including chinook, chum, coho (*O. kisutch*), sockeye (*O. nerka*), and pink (*O. gorbuscha*) are taken incidentally in the groundfish fisheries within the Gulf of Alaska. Salmon are not generally caught in longline and pot gear (Berger 2003). However, salmon are taken incidentally in most GOA trawl fisheries, thus this discussion focusses upon bycatch in the trawl sector. Salmon bycatch is currently grouped as chinook salmon or 'other' salmon, which consists of the other 4 species combined. Over 95% of the 'other salmon' bycatch consists of chum salmon (Table 3). Bycatch of chinook salmon in recent years (average of 18,191 salmon, 2000-2002) is slightly lower than the time series average (average of 20,181 salmon, 1990-2002). The bycatch of 'other' salmon is much lower in the past few years, declining from a high of about 52,803 salmon (1993-1995 average) to about 6,736 salmon taken in recent years (2000-2002) (Table 3).

Bycatch of 'other' salmon in the GOA groundfish trawl fisheries from 1993-1995 are shown in Table 4. Bycatch was highest in the month of July, hitting a peak in 1993 of 48,518, and again in 1995 of 42,164. This peak in other salmon bycatch during this period was due to the timing of the pollock trawl fishery. During these years the season opened in July. In 2000, the pollock trawl fishery timing was changed due to changes in regulation for Steller sea lions to the current seasonal openings of January 20, March 10, August 25 and October 1. Since this time the other salmon bycatch has been far less than the peak in 1995. Since 1995, the highest annual amount of other salmon bycatch was 13,539 in 1998, with amounts decreasing to 3,218 in 2002. The average bycatch of other salmon during 1993-1995 was 52,803 while from 2000-2002 the average bycatch was 6,736.

In the 2000-2002 fisheries, an average of about 11,000 chinook salmon per year were taken by the walleye pollock fishery, 3,200 chinook salmon in the Pacific cod fishery, 3,000 chinook salmon in the flatfish fishery (all targets combined), and 900 chinook salmon in other target fisheries (Table 5). In an average year, the walleye pollock fishery accounted for 60% of the chinook salmon bycatch, with the trawl fisheries targeting Pacific cod taking 18%, and flatfish fisheries taking 17%. About 3,700 'other' salmon were taken in the walleye pollock fishery, on average, during the 2000-2002 fisheries, although the annual bycatch numbers show a drastic reduction to only 795 'other'salmon in 2002. Nevertheless, in an average year, more of the 'other' salmon bycatch was been taken in the walleye pollock trawl fishery (46%) than other target fisheries, with the flatfish fishery also taking a substantial portion (35%).

It is likely that relative amounts of bycatch taken in the walleye pollock fisheries have been lower in recent years due to reduced catch limits for walleye pollock catches.

Location and Timing of Bycatch

The timing of salmon bycatch in GOA fisheries followed a predictable pattern in 2002. Chinook salmon were taken regularly in the first 15 weeks, and also in high quantities during weeks 20 and 30, which presumably coincides with openings of the walleye pollock fishery (Figure 1). Chum salmon were not taken in any great numbers until week 20, after which they were taken regularly through the end of the season (Figure 1). The timing of salmon bycatch in 2002 appears similar to what occurred in 2001. However, the 2000 fishery exhibited a different temporal pattern of bycatch, perhaps due to the U.S. District Court order that forced the walleye pollock fleet to fish outside of Steller sea lion critical habitat (Witherell et al. 2002).

Salmon bycatch occurs in the western and central GOA management areas, corresponding to locations of the trawl fisheries. 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. During the 2000-2002 period, chinook salmon were taken in relatively higher numbers in some trawl hauls to the east of Kodiak Island (up to 380 salmon per haul), although they can be taken in relatively high numbers per haul in other areas (Figure 2). A closer examination of where chinook salmon bycatch occurs in the walleye pollock fishery around Kodiak Island is provided in Figure 3. 'Other' salmon bycatch (up to 162 salmon per haul) occurs in the central GOA to the south and east of Kodiak Island, as well as in the western GOA south of the Alaska Peninsula (Figure 4). In the pollock fishery, the bycatch occurs east of Marmot Island and in the Barnubus Gully (Figure 5).

Comparison of salmon bycatch with regional and foreign run strength and hatchery release:

Several countries in addition to the U.S. have hatchery releases of chum and chinook salmon. The North Pacific Anadromous Fish Commission tabulates summaries of these hatchery releases in millions of fish (Table 6). For chinook salmon, Canada and the United States share the highest amount of hatchery releases, with the U.S. releases predominantly in the Alaska region and the Canadian releases predominantly located in the western and southern coasts of Vancouver Island. For chum salmon a far greater amount of hatchery releases are recorded in Japan than Canada, the United States or Russia. No correlation is available, however, with the bycatch of salmon in the GOA and the release from any of these hatchery sites.

It is difficult to ascertain direct effects of hatchery salmon releases and bycatch of salmon without specific information on those taken salmon. Currently the only information gathered is from Coded Wire Tags. The Coded Wire Tag (CWT) information may not accurately represent the true distribution of hatchery caught salmon. Most of the CWT tagging occurs within the British Columbia hatcheries and thus most of the CWT recovered come from those same hatcheries. No studies have specifically examined the stock composition of salmon bycatch from GOA trawl fisheries. However, future studies of chinook salmon bycatch will likely utilize allozyme methodology, because the allozyme baseline is complete enough to discriminate chinook stocks in Bering Sea stock mixtures (Teel et al. 1999). Allozymes have been successfully applied to chinook mixtures from confiscated high seas chinook salmon catches (R. Wilmot, National Marine Fisheries Service, Juneau, personal communication). Attempts are underway to obtain further tissue collections from Russian stocks that would improve the

accuracy of allozyme methods for delineating stock origins. However, funds to collect and analyze chinook samples from trawl bycatch are limited. The allozyme methodology, however, has been applied to chum salmon samples collected by research gillnets in the high seas (Urawa et al. 2000). Results indicate that Alaska stocks were common in the eastern central GOA (15% western Alaska, 25% Alaska Peninsula and Kodiak, 28% Southeast Alaska, 18% from Canada), and Asian chum salmon were predominant in the western GOA (25% Japan, 53% Russia, 13% western Alaska, 10% elsewhere). Additional research on stock discrimination for chinook salmon is being conducted using microsatellite DNA, but the microsatellite DNA baseline is not complete enough at present to be used for analysis of chinook salmon mixtures that potentially include chinook salmon throughout the Pacific Rim (A. Gharrett, University of Alaska Fairbanks, personal communication). Current research is focusing upon establishing this baseline for future use in this regard (Gharrett, 2004).

Crab Bycatch

Several species of crabs may be taken incidentally in GOA groundfish fisheries. Crabs may be taken incidentally in trawl, longline and pot fisheries. NMFS categorizes the bycatch amounts into 4 groups: red king crab, 'other' king crab, *C. bairdi* crab, and 'other' Tanner crabs. The 'other' king crab category may include blue king crab (*P. platypus*), golden king crab *(Lithodes aequispina*), and scarlet king crab (*L. couesi*). Although observer records have not been reviewed to ascertain the relative contribution of these species to the 'other' king crab category, it is likely that the vast majority, if not all, of these crab are golden king crab. Golden king crab are associated with deeper waters than blue king crabs and are found generally in slope areas (NMFS 2003). Thus the likelihood of the "other" king crab bycatch being comprised predominantly of golden king crab is high. The 'other' Tanner crab category may include two deepwater species: triangle Tanner crab (*C. angulatus*) and grooved Tanner crab (*C. tanneri*).

Amount of Bycatch in Trawl Fisheries

The number of crabs taken as bycatch in GOA groundfish trawl fisheries are shown in Table 7. Bycatch of red king crabs, other king crabs, and other Tanner crabs is relatively low. An average of 34 red king crabs and 721 individuals of other king crab species were taken in 2000-2002 trawl fisheries. Since 1993, the highest numbers of red king crab have been consistently taken in the combined flatfish fisheries, with the exception of 1999 where 231 red king crabs were taken in the rockfish fishery (Table 8). Flatfish fisheries, specifically the shallow water flatfish fishery and flathead sole (in 2002 only) account for most of the bycatch of red king crab (Table 9). Of the combined trawl fisheries for the three year average (2000-2002), Shallow water flatfish made up 61% of the total average and Flathead sole made up 12% of the total.

The bycatch of Tanner crabs in GOA trawl fisheries has fluctuated through the time series, reaching a high of 134,782 crabs in 1997 to a low of 29,947 crabs in 1999. Bycatch of Tanner crabs in recent years (88,010 crabs per year average, 2000-2002) is slightly higher than the average for the time series from 1993-2002 (79,238 crabs). Trawl fisheries account for about 53% of the Tanner crabs taken as bycatch in GOA groundfish fisheries, with the fisheries using pot gear accounting for about 47% of the Tanner crab bycatch, based on the 2000-2002 average (Table 10). Within the trawl fisheries, combined flatfish fisheries make up 71% of the total trawl contribution on average from 2000-2002, or 38% of the total average for those years (Table 10). Pacific cod trawl fisheries make up 24% of the total trawl contribution.

Location and Timing of Bycatch in Trawl fisheries

Bycatch amounts of Tanner crab taken in trawl fisheries appear to fluctuate temporally in direct response to groundfish catches, particularly catches of Pacific cod and flatfish, which are managed on a quarterly basis, with the trawl fishery beginning on January 20th each year. The seasons for trawl gear increased to 5 beginning in 2001. Bycatch of Tanner crabs in 2002 was highest (in numbers of crab) during weeks 12-17, 22-24, and 30-31, corresponding to seasonal release of the halibut PSC apportionment for use in the flatfish fishery (Figure 6).

The spatial distribution of bycatch was examined for all four crab categories, including red king crab, other king crab, *C. bairdi* Tanner crab, and other Tanner crab. Only 5 observations were made of red king crab bycatch, including one off Southeast Alaska that was presumably taken by longline gear (Figure 7). Other king crabs were taken along the slope in the central and western GOA, and a few outside of Ugak Bay off Kodiak (Figure 8). As previously stated, given this distribution, the other king crab taken on the slope were probably all golden king crab. Bycatch of *C. bairdi* Tanner crab was aggregated in the vicinity of Kodiak Island, but some bycatch also occurred south of the Alaska Peninsula (Figure 9). Other species of Tanner crab were taken in low numbers along the slope, and at higher numbers in a few nearshore locations (Figure 10).

A closer examination was made of the locations where Tanner crab were taken as bycatch in the 2000-2002 trawl fisheries targeting Pacific cod and flatfish. In the Pacific cod trawl fishery, Tanner crabs were taken along the northeast edge of the Chiniak Gully and also along the eastern edge of Barnabus gully (Figure 11). The flatfish trawl fisheries caught Tanner crab over a larger area around Kodiak Island.

Amount of bycatch in longline and pot fisheries:

Bycatch of Tanner crab and red king crab by gear and fishery for 2000-2002 are shown in Tables 9 and 10. Longline gear catches very few crabs of any species. The average percent contribution by gear type for Tanner crab are: 53% for combined trawl fisheries, 47% for pot fisheries and 0.04% for all longline fisheries. For red king crab, the average number of crabs taken in all fisheries for 2000-2002 is 46 crabs. Of this, 73% were in the trawl fishery, 13% in the pot fishery and 14% in the longline fishery. The longline Pacific cod fishery took 19 crabs in 2002, despite no crabs taken in the previous two years or for any other longline fishery. For 2002, 41% of red king crabs were taken in the trawl fishery, 20% in the pot fishery and 39% in the longline fishery.

Contribution to bycatch by the state waters cod fishery

An examination was made of the state waters Pacific cod fishery contribution to the Tanner crab bycatch amounts (Table 11). Preliminary data were obtained by ADF&G for three locations in the Western GOA: Kodiak, South Peninsula and Chignik. Data were available for various years in each location. In the Kodiak region, data were obtained for 1997, 1998, 1999 and 2001. Of these years, 2001 showed the highest number of Tanner crab, 171 crab. It was noted by ADF&G that this was obtained in only one observed trip. In the S. Peninsula region, the highest number of Tanner crab was obtained in 2001 where 52 crab were caught as compared with 0 to 1 in all other years for which data were obtained for this region (1998-2001). For Chignik, 2003 was the only year for which preliminary data were available. Here 42 crabs were obtained as bycatch. The state waters bycatch numbers for Tanner crab are still low in comparison to total Bairdi numbers in the GOA. Currently due to the absence of a full

state onboard observer program less than 1% of the state waters fishery is observed. ADF&G staff has noted that due to rising concerns regarding the limited available observed pots increased effort will be made to observe more trips during the 2004 fisheries (Mike Ruccio, personal communication).

King and Tanner crab population estimates:

Population estimates for the Kodiak District, S. Peninsula and Chignik king and Tanner crabs are provided by ADF&G. For red king crabs, the population estimate for the Kodiak District was 713,249 crabs, an increase from the previous survey. The Alaska peninsula stocks however are at a historic low with an estimated abundance of 43,509 crabs. These were mostly located in Pavlof Bay. For the Cook Inlet management region, no population abundances are estimated, but the survey is used to provide a relative abundance index(thus no extrapolation is done of survey data for an overall population abundance estimate). However, based on the abundance index, the red king crab stocks in the Cook Inlet management region are considered to be severely depressed and patchily distributed. It was noted in the assessment that all of the current population of red king crabs present in the region are vital to supporting the existing population (Bechtol et al. 2002). In the Southeast management region pot surveys are used to estimate trends in abundance in northern and southern bays of the region, however a regional estimate of total population is not available. Survey results are utilized to estimate relative abundances, estimated as catch per pot day for each sex and size class of crabs. Survey results indicated greater increases in abundance in the northern regions though both northern and southern regions have abundances comparable to the relatively high abundances seen in the early 1980s (Clark et al. 2003).

For Tanner crab, population estimates for the Kodiak District are at approximately 175.9 million crabs, for S. Peninsula 14.3 million crabs and Chignik 12.7 million crabs (Worton 2002). For the S. Peninsula this estimate represents an increase from the previous survey while for Chignik it represents a decrease from the previous survey. Population estimates for Cook Inlet management region list male Tanner crabs abundance 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 female. There is 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 Outer/Eastern). For the Southeast region, a population survey was begun in 1997/1998 to evaluate regional distribution of Tanner crab stocks and the relative abundance estimates. However, at present no estimates of overall Tanner crab abundance in the region are available.

Discussion

In February 2002, the Council initiated the analysis of alternatives to control salmon bycatch in the GOA groundfish trawl fisheries, and proposed alternatives, which included bycatch limits based on 1990-2001 average bycatch amounts (21,000 chinook salmon and 20,500 'other' salmon). Attainment of these limits by trawl fisheries would result in closure of specified areas for the remainder of the fishing year. The Council further clarified that specified areas would be designated based on analysis of areas that have had historically high bycatch rates. Our analysis suggests that these bycatch limit

amounts may not reflect the current manner in which the groundfish trawl fisheries operate and the reduced bycatch of salmon in more recent years. Additionally, our analysis shows that salmon bycatch in GOA trawl fisheries occurs at certain times and in certain fisheries, so more focused measures may be applied.

This paper provides information that will be useful in developing management measures to control salmon and crab bycatch in GOA groundfish fisheries. Given the Council directive to look at both salmon and crab bycatch measures as well as the additional elements in the October, 2003 Council motion, we offer the following alternatives for consideration and further development and analysis:

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 for the remainder of the year 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 coop for hotspot management

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 to flatfish trawling for the remainder of the year if or when a trigger limit is reached by the flatfish fishery.

Alternative 3: Year-round bottom trawl closure in areas with high bycatch or high bycatch rates of Tanner crab.

Alternative 4: Voluntary bycatch coop for hotspot management

Red King Crab (Additional Alternative for consideration based on 10/03 motion)

Alternative 1: Status Quo (no bycatch controls).

Alternative 2: Trigger bycatch limits for red king crab. Specific areas with high bycatch (or high bycatch rates) are closed to flatfish trawling (and potentially other areas for P. cod longline and pot gear) for the remainder of the year if or when a trigger limit is reached by the fishery.

Alternative 3: Year-round bottom trawl closure in areas with high bycatch or high bycatch rates of red king crab.

Alternative 4: Voluntary bycatch coop for hotspot management

Other Salmon (Additional Alternative for consideration based on 10/03 motion)

Alternative 1: Status Quo (no bycatch controls).

Alternative 2: Trigger bycatch limits for other salmon. 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 the pollock trawl fishery (and potentially additional areas for flatfish trawling)

Alternative 3: Seasonal closure to all trawl fishing in areas with high bycatch or high bycatch rates.

Alternative 4: Voluntary bycatch coop for hotspot management

Trigger limits as proposed under alternative 2 would close designated areas (as yet to be defined) to trawling in specified fisheries once a bycatch limit has been reached. For instance, for Chinook salmon, once a bycatch limit has been reached, the designated area closure would be closed to pollock fishing for the remainder of the year. Likewise for Tanner crab, once the bycatch limit has been reached, the area closure for the flatfish fishery would go into effect for the remainder of the year. For other salmon, trigger limits may also be considered for flatfish trawl fishery(in addition to the pollock trawl fishery) given the relative contribution of bycatch by that fishery.

The proposed alternatives using trigger closures would work similar to other existing PSC management measures. Currently in the GOA, PSC limits exist in the flatfish fishery for halibut only, whereby if a given apportionment is reached within a specified season, the flatfish fishery is then closed for the remainder of that season. Trigger bycatch limits as proposed here would be similar, but would not close the area-wide flatfish fishery. Instead, designated high bycatch or hotspot areas would be closed to the fishery if the given trigger bycatch limit was reached while the fishery was being prosecuted. Similar trigger closures have been implemented in the Bering Sea to control the bycatch of Tanner crab, snow crab (*C. Opilio*) and red king crab (Witherell and Pautzke 1997).

Year-round and seasonal trawl closures, such as those as proposed under alternative 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. Specific areas are designated as Type I, Type II and Type III areas depending upon the importance of the area to concentrations of red king crab at various life stages. Type I closures are closed year-round to all non-pelagic trawling. Type II areas are closed during the molting period for red king crab (February 15-June 15), while Type II areas are closed only during specified 'recruitment events" and are otherwise opened year-round.

Alternative 3 for red king crab and Tanner crab proposes year-round bottom trawl closures as opposed to seasonal closures given the relationship between the timing of the flatfish fishery and the bycatch of Tanner crabs (Figure 6). Further examination of the timing of the red king crab bycatch would need to be done in order to evaluate the appropriate temporal nature of the proposed closure. For salmon, however, the highest bycatch is seasonal and is tied to the timing of the walleye pollock fishery. Here seasonal closures of hot spot locations could be examined rather than year-round closures. Seasonal salmon closures have been utilized to control salmon bycatch in the BSAI groundfish fisheries. The Chum Salmon Savings Area in the eastern Bering Sea is closed to trawl fishing for all of August, and can be extended though October 14 if specified chum salmon bycatch limits are reached in the trawl fishery. For chinook salmon, the Chinook Salmon Savings Areas are closed when annual chinook salmon bycatch limits are reached by the trawl fishery (similar to a seasonal closure under the trigger bycatch limits as described for alternative 2).

Alternative 4 for both crab and salmon species proposes enacting 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 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). 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).

A voluntary cooperative program could be modeled after the AFA catcher vessel Intercooperative Agreement between the nine catcher vessel cooperatives in the BSAI pollock fishery (Gruver 2003). Some aspects of this intercooperative agreement which would be useful to include in a GOA coop alternative include provisions for: allocation, monitoring and compliance of the PSC caps amongst the catcher vessel fleet; establishment of penalties for coops 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. Cooperative agreements in the BSAI vary between salmon species, with bycatch rates calculated for use in monitoring access to the Chum Salmon Savings Area while hot spot avoidance areas are utilized for chinook salmon bycatch reduction. 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 coops in the GOA.

Implications and coordination with GOA groundfish rationalization initiative:

Rationalization programs, such as IFQ's or cooperatives, may also provide additional benefits for controlling bycatch. Rationalization programs eliminate the race for fish, thereby allowing fishermen to modify fishing practices (e.g., time and areas fished, gear modifications, etc.) to reduce bycatch, whether in response to regulatory requirements or on a voluntary basis. In a rationalized fishery, members are more likely to actively exchange information to avoid areas of high bycatch rates. In an absolute sense, rationalization programs would be expected to reduce effort, thereby reducing the amount of time gear is in the water and the probability of intercepting bycatch species.

If the Council elects to limit salmon and crab bycatch in the Gulf, those limitations will need to be coordinated with any rationalization program. Limits on salmon and crab could be applied as a fleet cap with rules similar to the current halibut PSC rules. This overall limit would have the potential to perpetuate a race for fish, if the cap is binding. Optionally, salmon and crab bycatch shares could be allocated to individuals or cooperatives. A system for allocation and management of these shares would need to be developed.

Next Steps:

The alternatives we have proposed serve as a starting point for discussion as to how bycatch measures might be conceived of and analyzed for the GOA. At this point, no specific areas or bycatch limits have been suggested. If the Council initiates analysis of the proposed alternative bycatch control measures, we would examine the costs to the fishing industry, as well as the potential conservation benefits, if any, resulting from controlling bycatch of chinook salmon, other salmon, red king crabs and Tanner crabs. At this time, we have not estimated the effects of bycatch on population size to see if a conservation issue exists. Assessment of the impacts of bycatch on population size will require additional data inputs such as population size estimates, the size (and age) of crabs and salmon taken as bycatch, and estimates of discard mortality and unobserved mortality.

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Table 1: Reported crab bycatch mortality rates in the North Pacific (Alverson et al, 1994)

Bycatch Species	Area	Fishery	Mortality Percentage
Crab	GOA	Longline	50
Crab	GOA	Trawl	100
Crab	North Pacific	Longline, domestic halibut	50
Crab	North Pacific	Trawl	50–100
Dungeness crab (hardshell)			
	Washington	Trawl	2
Dungeness crab (hardshell)			
	West Coast	Crab pot, dungeness	2–4
Dungeness crab (softshell)			
	Washington	Trawl	9
Dungeness crab (softshell)			
	West Coast	Crab pot, dungeness	22–25
Dungeness crab, females			
	GOA	Trawl	6–11
Dungeness crab, males	GOA	Trawl	0–4
King crab	BS/AI	Trawl, JV sole	77–81
King crab	GOA	Trawl	2
King crab	North Pacific	Trawl	19
King crab	North Pacific	Trawl	79
Softshell King crab	GOA	Trawl	21
Tanner crab	BS/AI	Trawl, JV sole	74–82
Tanner crab	GOA	Trawl	36
Tanner crab	North Pacific	Trawl	12
Tanner crab	North Pacific	Trawl	78

Table 2: Reported salmon mortality rates in the North Pacific (Alverson et al. 1994)

Bycatch Species	Area	Fishery	Mortality Percentage
Chinook	North Pacific	Purse seine	50–90
Chinook	North Pacific	Troll	20–30
Chinook	Washington	Gillnet	2–28
Chinook, large	SE Alaska	Purse seine	24
Chinook, medium	SE Alaska	Purse seine	68
Chinook, small	SE Alaska	Purse seine	60
Chinook, illegal	SE Alaska	Purse seine	50–90
Chinook, legal	GOA	Troll	25
Chinook, legal	GOA	Troll, coho	20
Chinook, legal	SE Alaska	Troll	8–13
Chinook, sublegal	GOA	Troll	28
Chinook, sublegal	GOA	Troll, coho	24
Chinook, sublegal	SE Alaska	Troll	19–28
Coho, illegal	West Coast	Troll	34–52
Coho, illegal	West Coast	Troll	42
		Troll	
Coho, juvenile	West Coast	(barbless hooks)	77
		Troll	
Coho, juvenile	West Coast	(barbed hooks)	33
Salmon	North Pacific	Longline	100

Table 3. Bycatch of Pacific salmon in Gulf of Alaska groundfish trawl fisheries, by species, 1990-2002.

	Numbers of Fish				
Year	Chinook	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[a]			
1999	30,600	7,529[a]			
2000	26,705	10,996[a]			
2001	14,946	5,995[a]			
2002	12,921	3,218[a]			
Average	20,181	18,941[b]			

[a] Coho, sockeye, and pink salmon are combined with chum salmon.
[b] Average chum salmon bycatch includes chum, coho, sockeye, and pink salmon.

Table 4: Bycatch of 'other' salmon in the Gulf of Alaska from 1993-1997

	1993	1994	1995
January	203	3,690	2
February	919	3,950	2,007
March	213	164	39
April	227	109	1,290
May	150	0	39
June	4,927	5,956	9,928
July	48,518	18,709	42,163
August	303	15	0
September	4	1	11
October	832	4,632	9,313
November	64	2	0
December	28	0	0
Total	56,388	37,228	64,792

Table 5. Bycatch of Pacific salmon in Gulf of Alaska groundfish trawl fisheries, by target fishery, 2000, 2001, and 2002.

	Numbers of Chinook Salmon			Number of Other Salmon		
Fishery	2000	2001	2002	2000	2001	2002
Walleye pollock	18,413	9,421	5,162	7,450	2,741	795
Pacific cod	2,747	2,796	4,066	0	677	29
Flatfish	4,386	2,295	2,443	2,979	1,857	1,500
Other targets[a]	1,160	434	1,250	567	720	894
Total GOA	26,706	14,946	12,921	10,996	5,995	3,218

[a] Other targets include rockfish and sablefish.

Table 6: Salmon fry released by species and country in millions of fish (1999-2001)

	Chum:			Chinook:		
Hatchery Releases:	1999	2000	2001	1999	2000	2001
U.S.A.	877.8	546.5	942.2	88.0	209.5	21.0
Canada	97.3	97.3	67.5	53.5	53.5	44.6
Japan	1867.9	1817.4	1831.2	-	-	-
Russia	278.7	326.1	316.0	0.6	0.5	0.5

Table 7. Bycatch of crabs in Gulf of Alaska groundfish trawl fisheries, by species, 1990-2002.

	Numbers of Crabs			
Year	Red king	Other king	*C. bairdi* Tanner	Other Tanner
1993	1,012	na	55,304	na
1994	45	na	34,056	na
1995	223	na	47,645	na
1996	192	na	120,796	na
1997	18	na	134,782	na
1998	275	na	105,817	na
1999	232	na	29,947	na
2000	35	698	48,716	na
2001	46	551	125,882	na
2002	20	914	89,433	na
Ave. 2000-2002	34	721	88,010	na

Table 8: Red king crab bycatch (in numbers) in the Gulf of Alaska from 1993-2002.

Year	Bottom pollock	Mid-Pollock	P.Cod	Flatfish combined	Rockfish	Etc./Other	Total
1993	0	0	192	820	0	0	1012
1994	0	0	3	42	0	0	45
1995	0	0	15	208	0	0	223
1996	0	0	1	191	0	0	192
1997	0	0	3	15	0	0	18
1998	0	0	83	192	0	0	275
1999	0	0	0	1	231	0	232
2000	0	0	0	35	0	0	35
2001	0	0	0	46	0	0	46
2002	0	0	0	20	0	0	20
Average 1993-2002	0	0	30	157	23	0	210

Table 9: Bycatch of Red king crab on Gulf of Alaska groundfish fisheries, by gear type and target fishery, 2000-2002

Numbers of Red King Crab

Gear and Fishery	2000	2001	2002
Longline:			
Pacific cod	0	0	19
Other species	0	0	0
Pot:			
Pacific cod	0	8	10
Trawl:			
Walleye pollock	0	0	0
Pacific cod	0	0	0
Flatfish:			
DWF	0	0	0
SWF	35	46	3
Flathead sole	0	0	17
Arrowtooth	0	0	0
Rex sole	0	0	0
Other targets	0	0	0
Total GOA	35	54	49

Table 10. Bycatch of Tanner crabs in Gulf of Alaska groundfish fisheries, by gear type and target fishery, 2000 - 2002.

Gear and Fishery	Numbers of C. bairdi Crab 2000	2001	2002
Longline			
Pacific cod	167	14	17
Other species[a]	1	17	5
Pot			
Pacific cod	65,786	69,091	95,766
Trawl			
Walleye pollock	1,821	11,362	774
Pacific cod	11,177	46,822	4,905
Flatfish			
Deepwater flatfish	45	2,533	185
Shallow water flatfish	18,924	13,164	33,914
Flathead sole	3,015	45,269	26,924
Arrowtooth flounder	10,610	2,194	14,626
Rex sole	2,897	2,145	7,198
Other targets[b]	235	2,394	905
Total Trawl	*48,814*	*125,883*	*89,431*
Total GOA	114,768	195,005	185,219

[a] Other species include skates, octopus, squid, and sculpins.
[b] Other targets include rockfish and sablefish.

Table 11: Pacific cod observer data, crab bycatch numbers, observed vessels only (source, ADF&G)

						Cod catch			
Area	**Year**	**Observed trips**	**Pots lifted**	**Tanner Crab**	**King crab**	**Whole pounds**	**Metric tons**	**Tanner/mt**	**king/mt**
Kodiak	1997	1	333	11	0	36,432	16.53	0.67	0.00
Kodiak	1998	1	261	4	9	20,418	9.26	0.43	0.97
Kodiak	1999	3	1006	48	0	69,257	31.42	1.53	0.00
Kodiak	2001	1	200	171	0	6,638	3.01	56.79	0.00
South Peninsula	1998	1	174	1	0	47,453	21.53	0.05	0.00
South Peninsula	1999	1	240	0	0	40,952	18.58	0.00	0.00
South Peninsula	2000	2	419	0	0	126,908	57.57	0.00	0.00
South Peninsula	2001	2	619	52	0	130,771	59.32	0.88	0.00
South Peninsula	2002	1	58	1	0	10,248	4.65	0.22	0.00
Chignik	2003	1	268	42	0	28,297	12.84	3.27	0.00

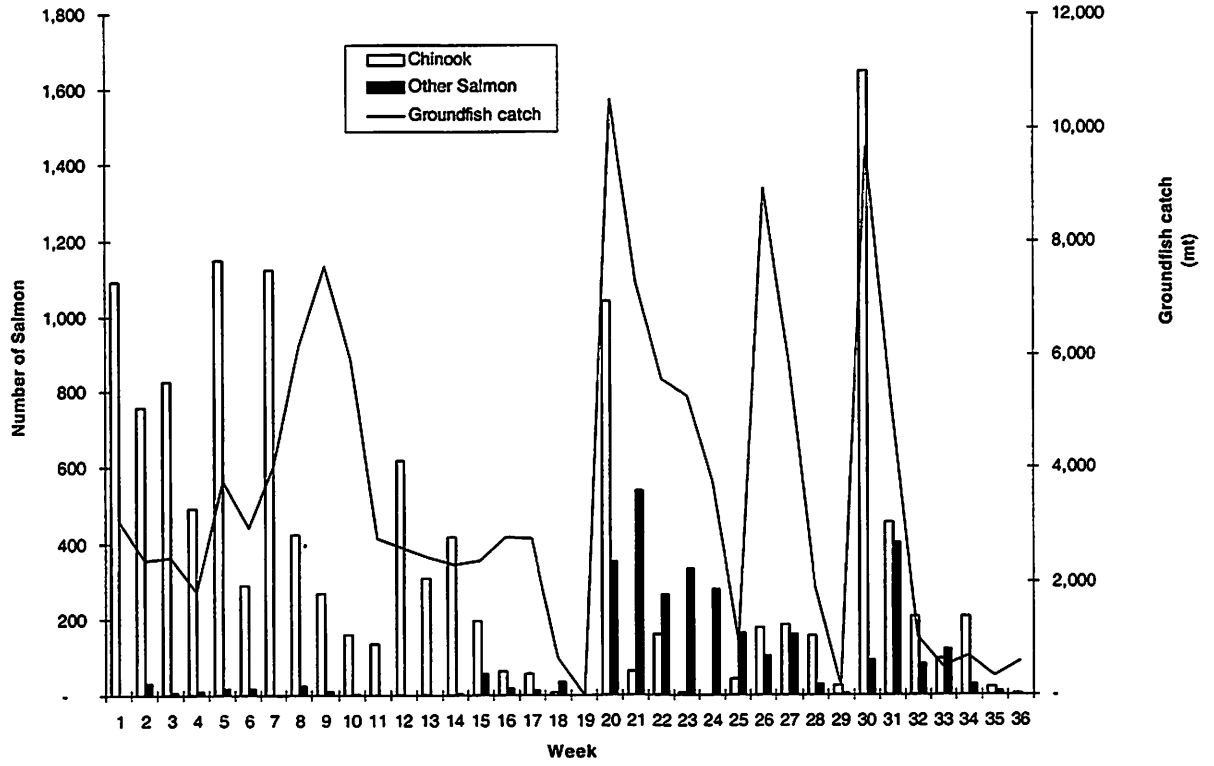

Figure 1. Chinook and Other Salmon bycatch in the 2002 Gulf of Alaska Fisheries with overall Groundfish catch.

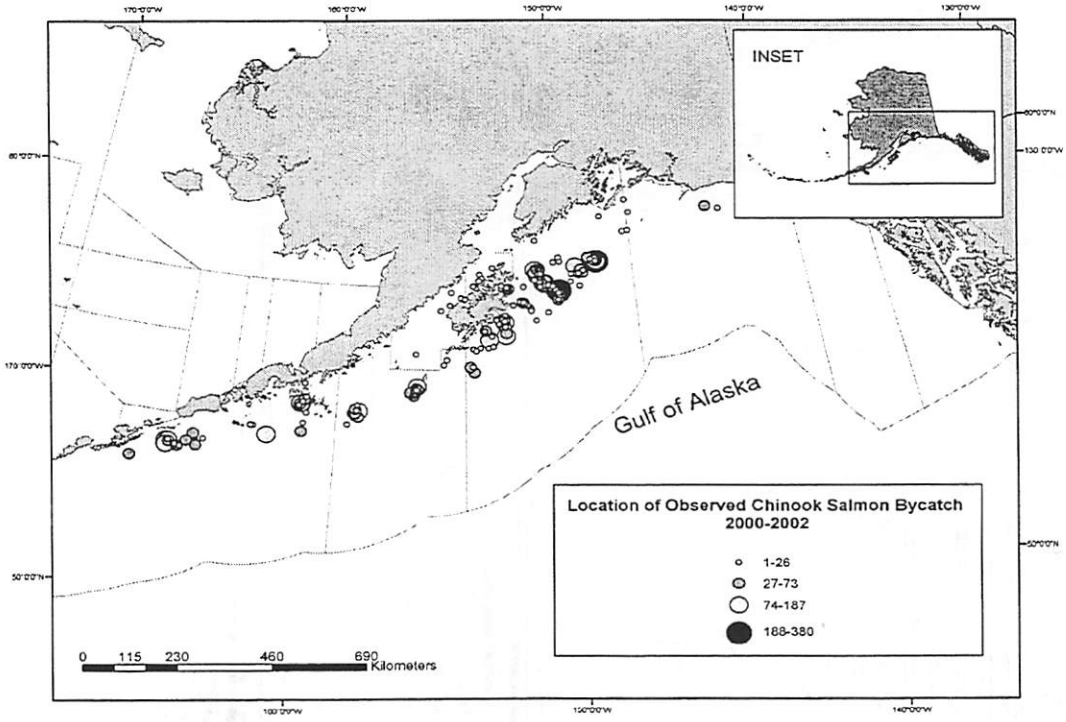

Figure 2. Locations of all observed chinook salmon bycatch (extrapolated numbers) 2000-2002

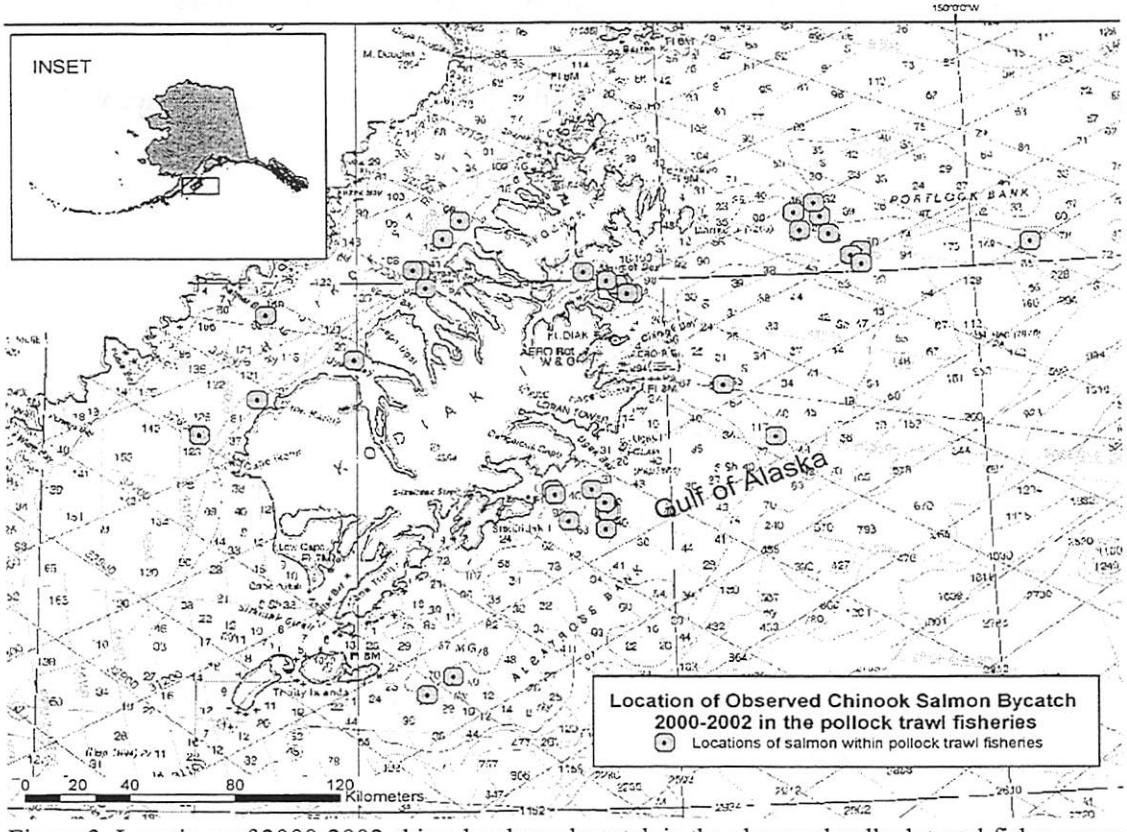

Figure 3. Locations of 2000-2002 chinook salmon bycatch in the observed pollock trawl fishery near Kodiak Island.

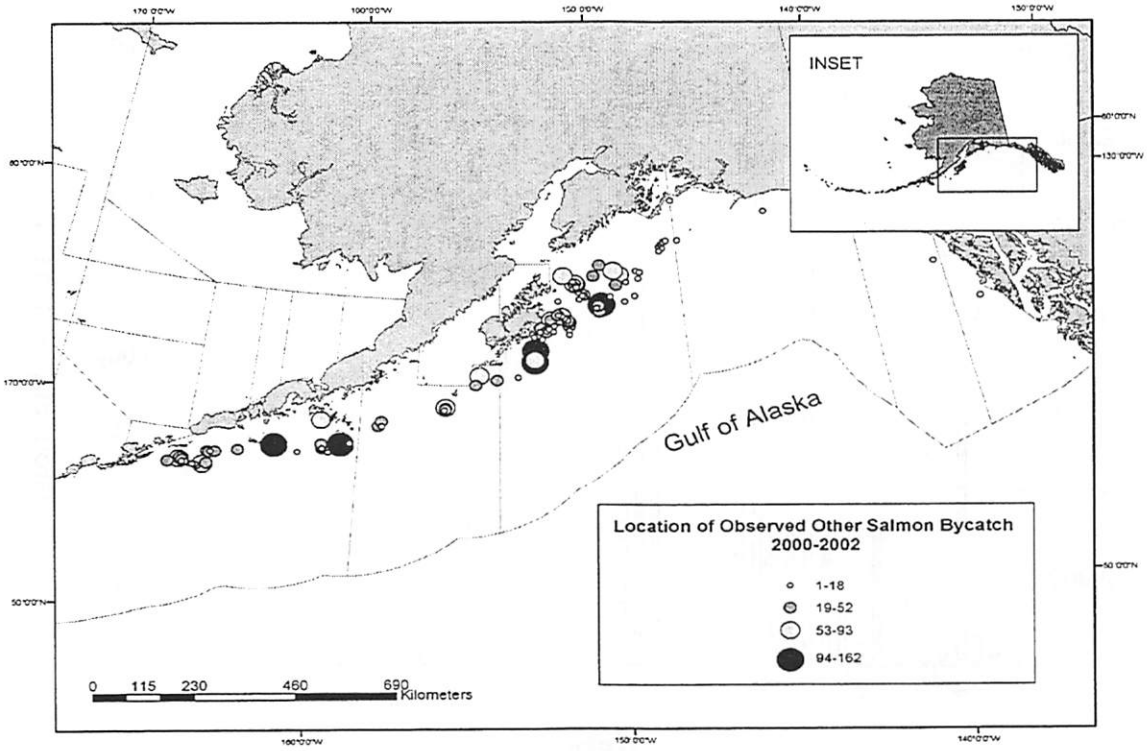

Figure 4. Locations of observed 'other salmon bycatch' (extrapolated numbers) 2000-2002

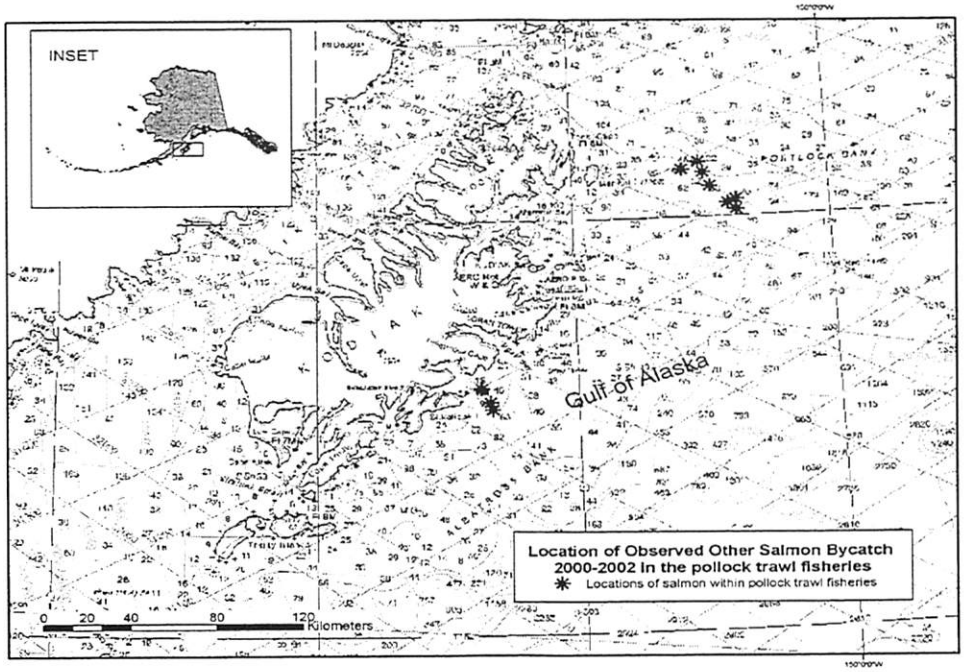

Figure 5. Locations of 2000-2002 other salmon bycatch in the pollock trawl fishery near Kodiak Island.

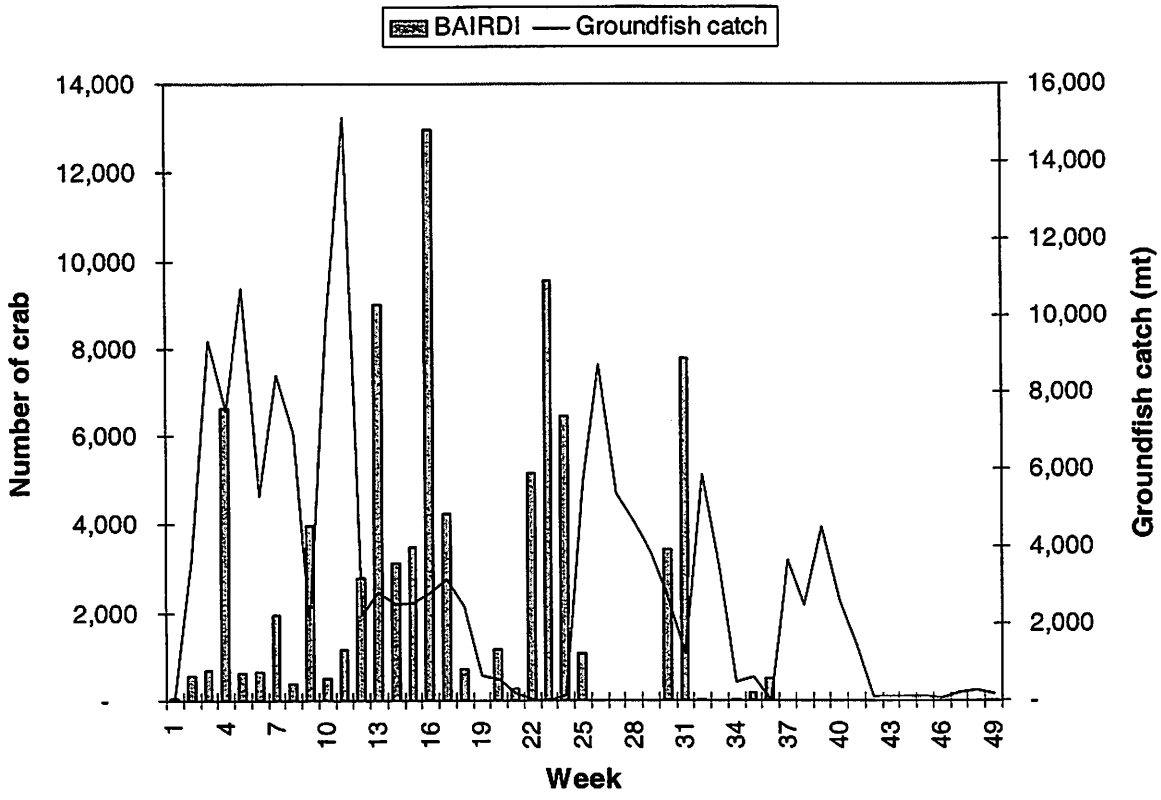

Figure 6. Weekly bycatch of Bairdi Crab 2002 in the Gulf of Alaska fisheries with overall groundfish catch

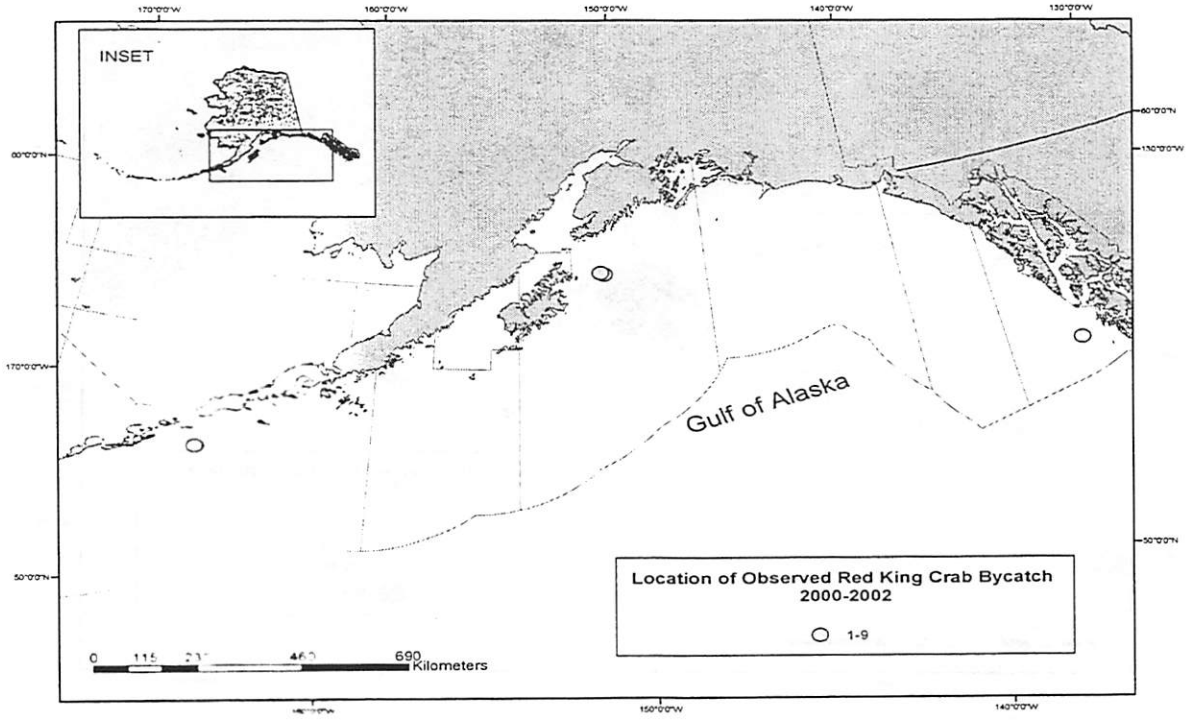

Figure 7. Observed locations of red king crab bycatch (extrapolated numbers) in all fisheries 2000-2002.

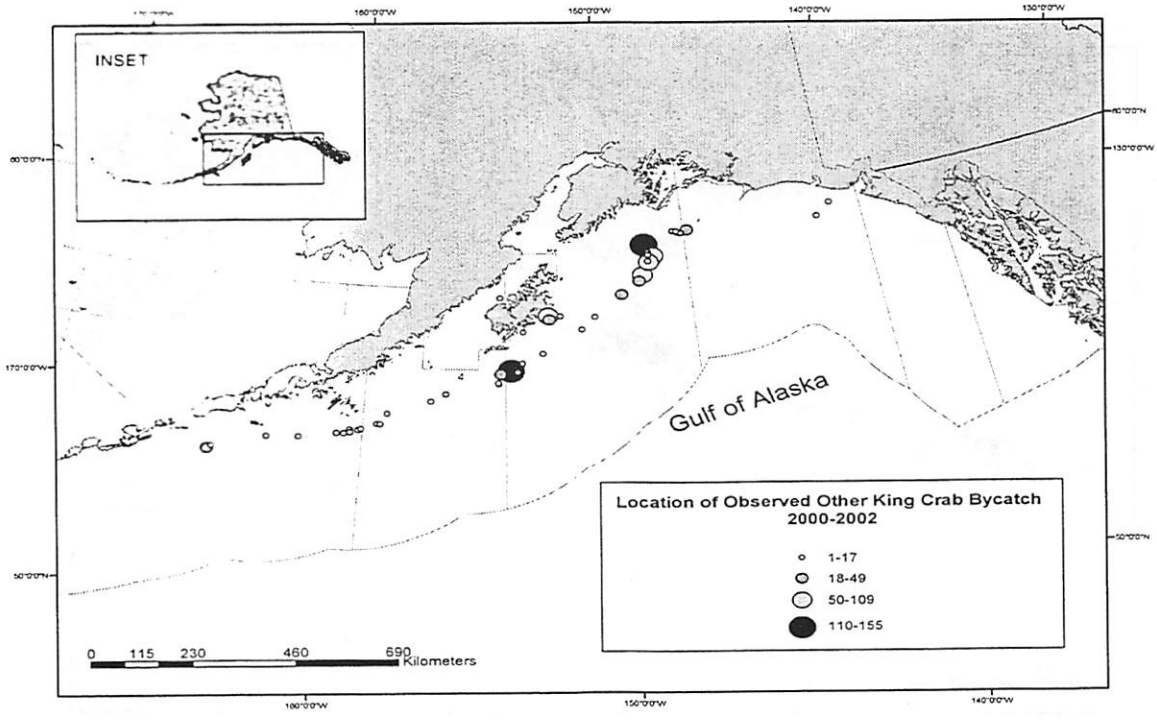

Figure 8. Observed locations of other king crab bycatch (extrapolated numbers) in all fisheries 2000-2002.

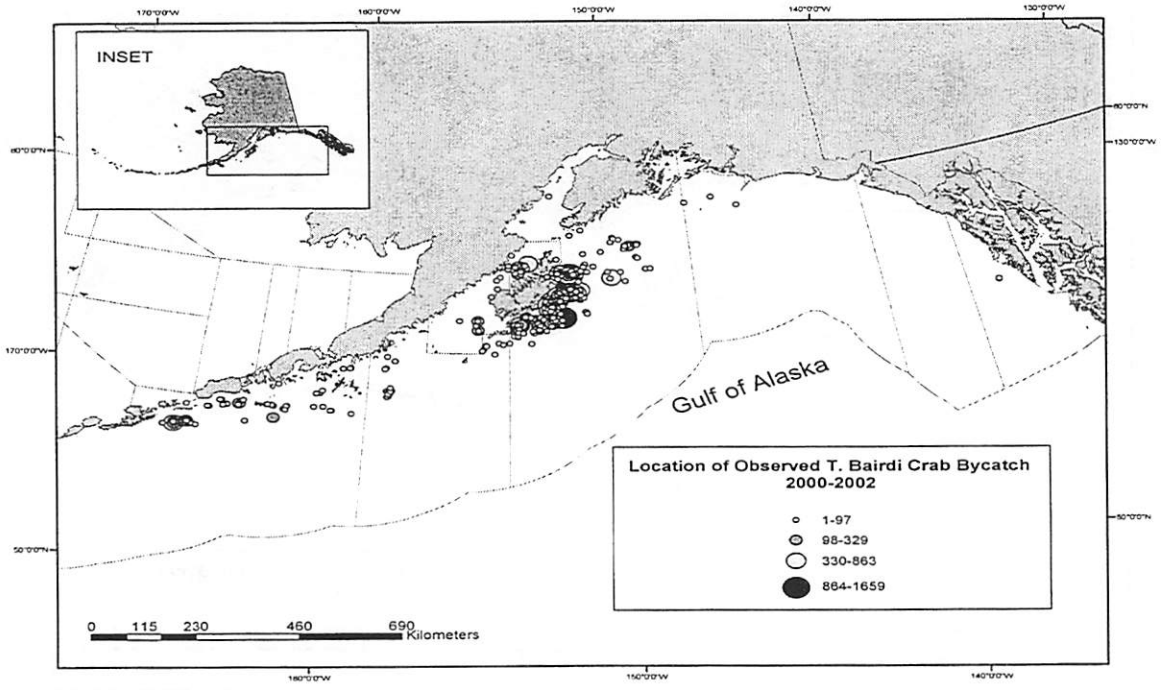

Figure 9. Locations of C. tanneri (Bairdi) crab bycatch (extrapolated numbers) in all fisheries 2000-2002.

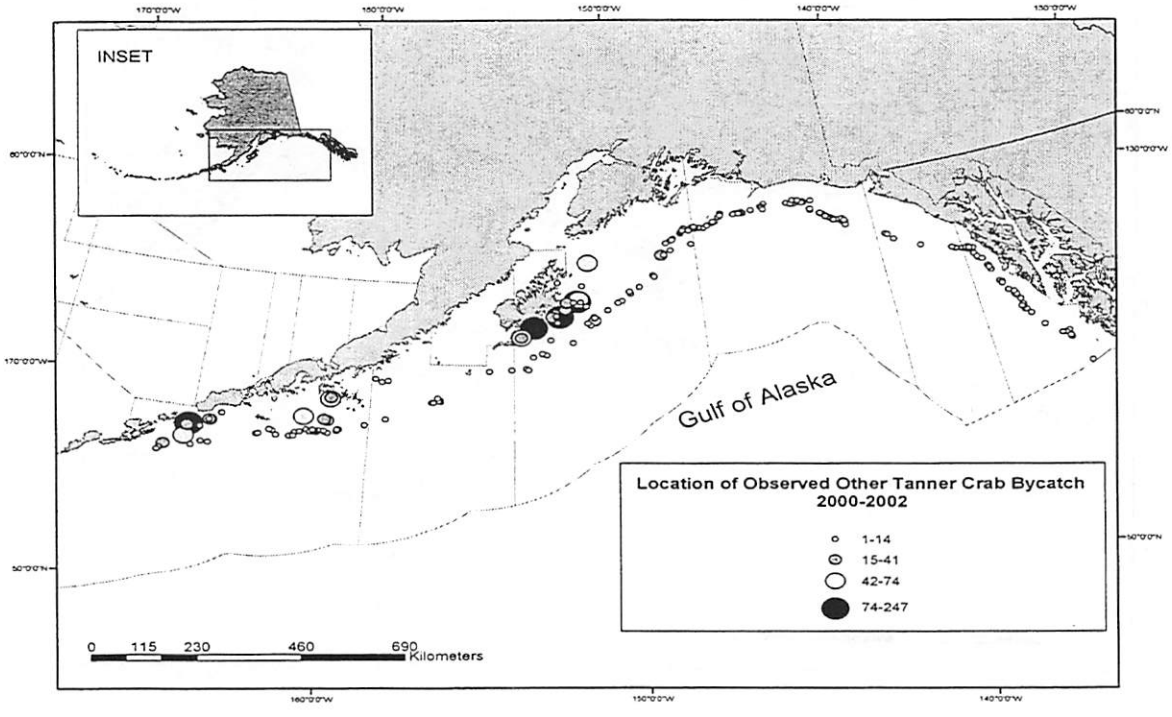

Figure 10 Locations of other tanner crab bycatch (extrapolated numbers) in all fisheries 2000-2002.

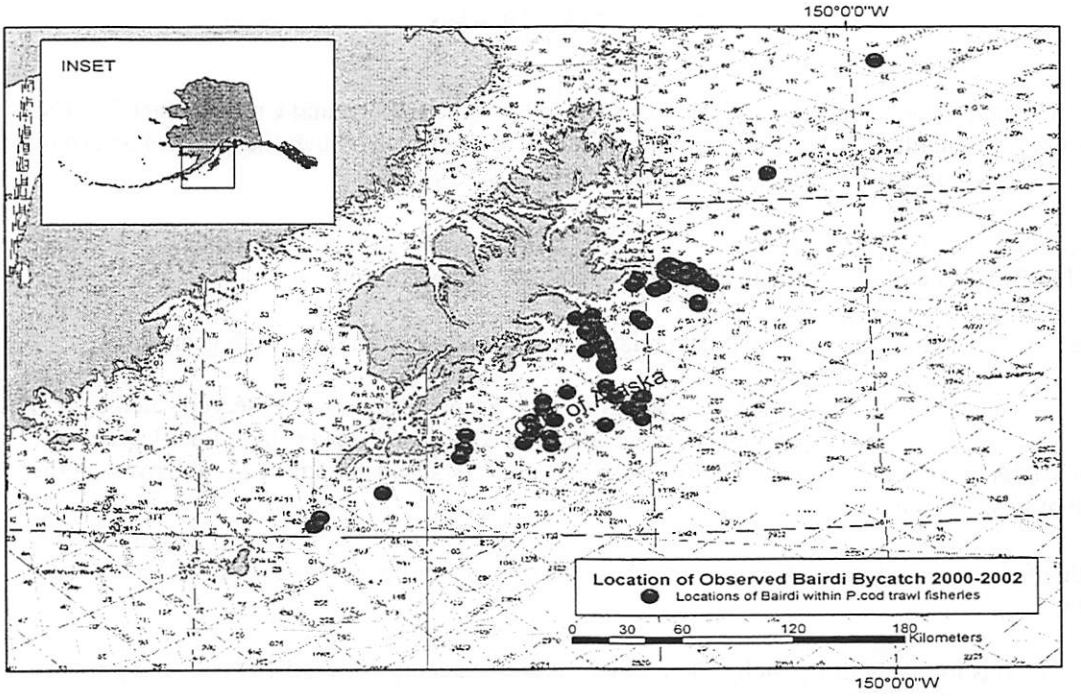

Figure 11. Locations of observed C. tanneri (Bairdi) crab bycatch (extrapolated numbers) within the P.Cod trawl fishery 2000-2002 Kodiak Area.

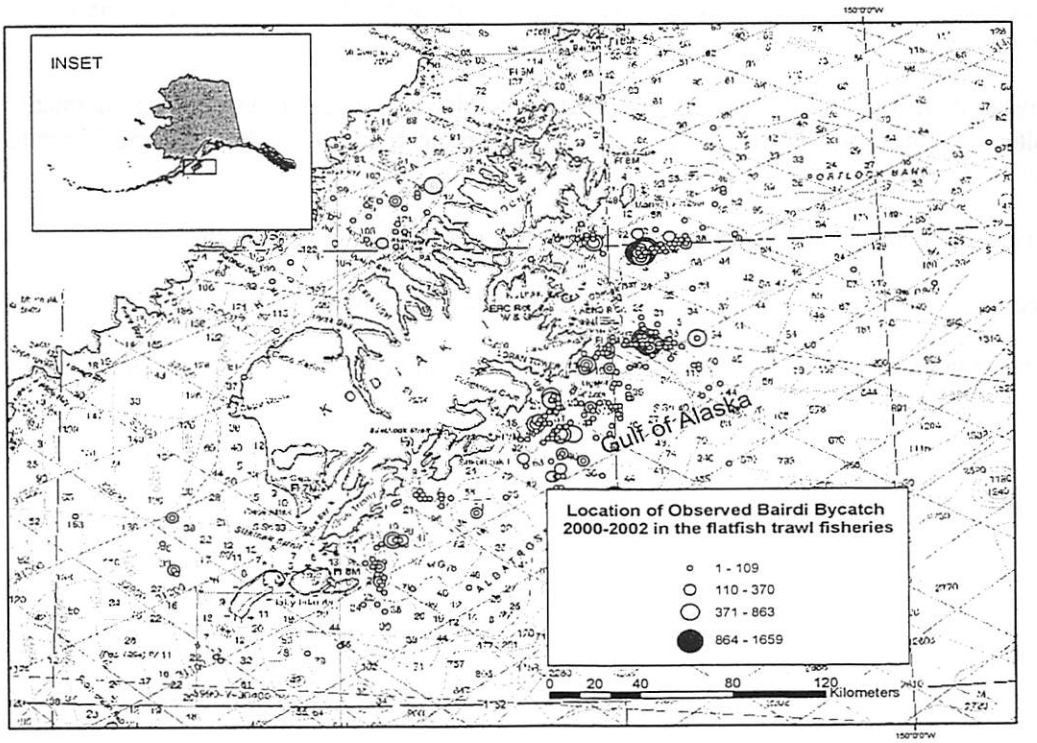

Figure 12. Locations of observed c. tanneri (Bairdi) crab bycatch (extrapolated numbers) within the combined flatfish trawl fisheries 2000-2002 Kodiak Area.

Proposed staff analysis on Salmon and Crab bycatch measures
10/11/03

The Council recommends that the alternatives on p.5 of the Salmon and Crab Bycatch Measures for GOA Groundfish Fisheries paper not be adopted at this time and that the analysis be expanded to include, to the extent practical, a discussion of the following:

A comparison of salmon bycatch with hatchery salmon releases (in Alaska, Japan and Canada) and regional salmon run strength and catch of foreign origin salmon.

Red king crab and Bairdi bycatch data relative to population estimates for all gear types.

Use of observer data. The discussion would include a table of the % of observed catch by region by season and methods of extrapolation for unobserved vessels (smaller long line fleet), conversion of observer data to identify catch in State waters, and any known problems with the use of observer data.

Other fisheries in which salmon and crab bycatch occurs — ie. pot codfish and pollock bottom trawl.

The reasons for the high bycatch of the "other salmon" category between 1993-95 and provide salmon bycatch data by month by area.

Description of gear specific salmon and crab mortality rates.

Bairdi bycatch in the pacific cod pot fishery - extrapolate as needed to provide numbers for state waters fishery.

Inclusion in the draft alternatives of a BSAI style bycatch pool hotspot management alternative, an alternative that provides for red king crab bycatch protections and an "other salmon" bycatch protections alternative.

Changes in the regulatory requirements for observer coverage in the pot cod fishery.

Discussion of how crab and salmon bycatch limits integrate with Gulf Rationalization.

Distribution and population information on Tanner and king crab will be provided from survey data.

PUBLIC TESTIMONY SIGN-UP SHEET FOR AGENDA ITEM C-1 GOA Rationalization

	NAME (PLEASE PRINT)	AFFILIATION
1	Craig Cochran	[illegible]
2	Sam Cotten	A[illegible]B
3	ALEXUS KWACHKA	G.S.F.A.
4	Tim Blott	Ocean Beauty Seafoods
5	David McArthur	A.S.F.U.
6	Joe Sullivan	Mundt MacGregor Kodiak
7	[illegible] Soma	
8	Dorothy Childers	AMCC
9	THURN SMITH, GARY MERIGAN	THE THURN & GARY SHOW
10	Buck LAUKITIS	NPFA
11	Teresa KANDIANIS	Kodiak Fish Co.
12	J[illegible] BONNEY	
13	[illegible] ROBINSON	[illegible]
14	Joe Childers	Western Gulf of Ak Fisherman
15	David Polushkin	K-Bay Fishing Assoc.
16	[illegible] LUTTRELL, Lori SWANSON	GFF
17	Ken Tippett	Alaska Boat Co.
18	Ilia Kuzmin	Fisherman K Bay Assoc. [illegible]
19	Charlie Parsons	FV Nightwatch
20	Margaret Hall	FV's Progress + Vanguard
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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.