


MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke  
Executive Director 

DATE: November 28, 1994

SUBJECT: Groundfish Amendments

ESTIMATED TIME  
3 HOURS

**ACTION REQUIRED**

- (a) Review actions to protect red king crab in Bristol Bay, receive report on Opilio Snow Crab bycatch, and consider next steps.
- (b) Consider increasing VIP bycatch standards for the BSAI other trawl category for 1995.

**BACKGROUND**

Red king crab protection

The Council met by teleconference on November 11, 1994 to discuss possible groundfish closures to protect red king crab in the Bering Sea. Dave Ackley (ADF&G) provided an analysis of red king crab bycatch in the Bering Sea with alternative areas for trawl closures. Survey data showed that although a majority of red king crab are found in Area 512, areas to the west also have concentrations of red king crab. Bycatch data from trawl fisheries showed a similar distribution. To protect these crab, the Council recommended an emergency rule to close to all trawling in the area from 162° to 164° W longitude, 55°45' to 57° N latitude. This area, along with a summary of the teleconference, is shown in item D-2(a). Also, the Council recommended 100% observer coverage with daily catch reporting on all trawlers fishing in Areas 511 and 516. At this meeting, the Council may wish to comment on its Emergency Rule recommendation, and should consider whether to proceed with a more permanent solution.

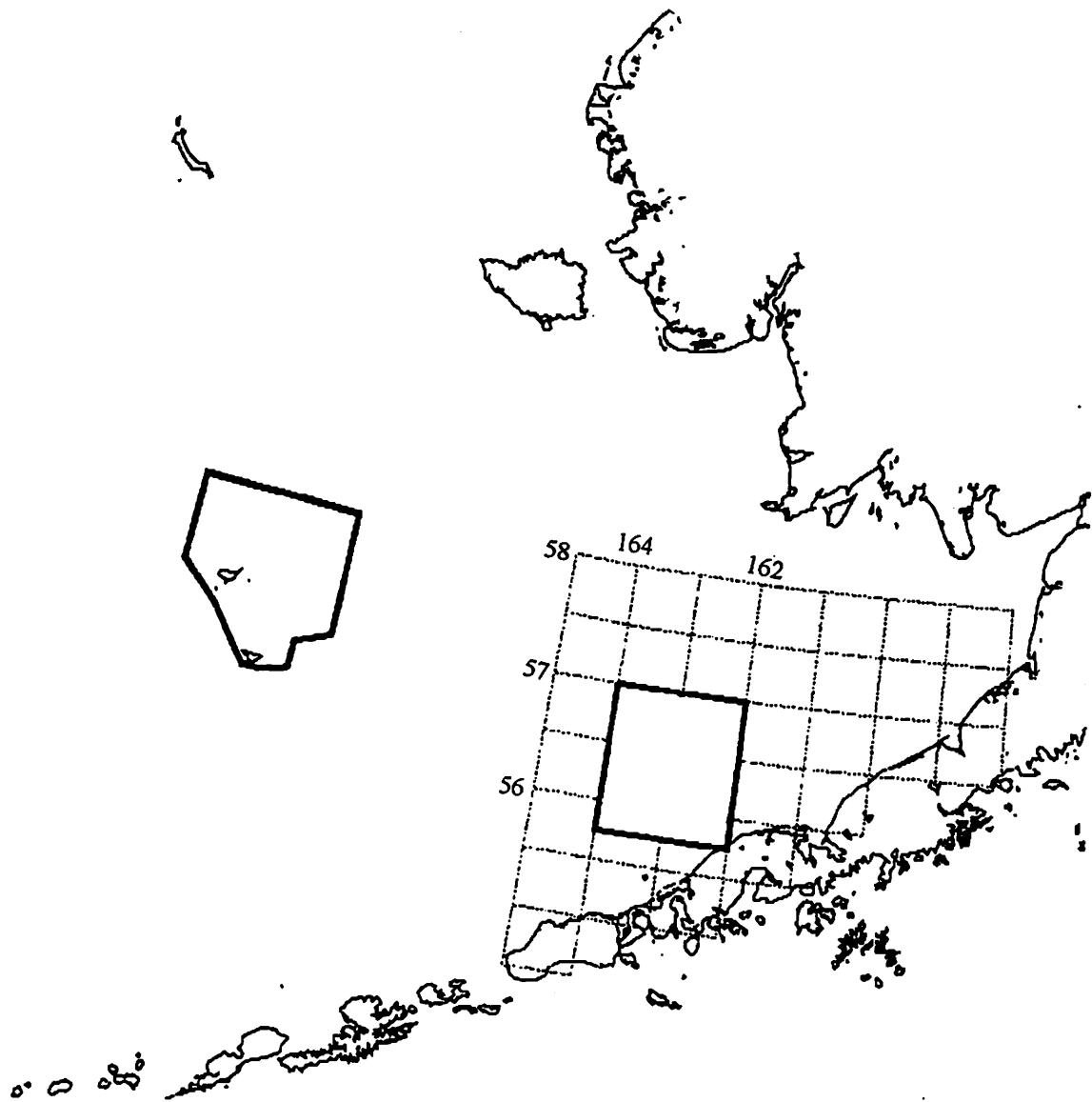
Opilio bycatch

In June, the Council requested staff to provide additional information on Opilio bycatch for the September meeting, but the report was not presented due to time limitations. Specifically, the Council requested information on the following: historical bycatch by fishery, breeding habitat, bycatch mortality, percentage of total biomass, percentage of TAC, information on age composition and adult equivalents, bycatch avoidance potential like the Sea State Program, and observer methodology and identification. The attached discussion paper (Item D-2(b)) was prepared to summarize available information, which should assist the Council with determining whether or not a comprehensive analysis of PSC caps or other program is warranted.

### Other Trawl Category VIP Standards

The second item from the November teleconference was to consider increasing the crab and halibut bycatch rate standards for the BSAI Other Trawl category for the Vessel Incentive Program (VIP). Some industry members had requested an increase in the bycatch standards to allow voluntary use of larger mesh sizes in the 1995 season. For 1994, the BSAI other trawl category (including Pacific cod and rock sole fisheries) bycatch standard was 2.5 Zone 1 red king crab/mt of groundfish and 30 kg of halibut/groundfish mt. The Council moved to defer making any recommendations until a regularly scheduled Council meeting, when more information could be made available. As it stands, no more information is available. A summary of the teleconference is in item D-2(a).

Figure 1. Area in the Eastern Bering Sea recommended by the Council to be closed to all trawling for the first part of 1995 by Emergency Rule. The Pribilof Island trawl closure area, adopted by the Council in April, is also shown.



## DRAFT SUMMARY

### North Pacific Fishery Management Teleconference November 14, 1994

On November 14, 1994, the North Pacific Fishery Management Council met by teleconference to receive reports on bycatch of king crab in groundfish fisheries in the Bristol Bay area and to determine whether emergency action was necessary to protect crab stocks. The Council was also scheduled to consider an increase in the VIP bycatch rate standards for the Bering Sea/Aleutian Islands other trawl category.

#### Council members participating in the teleconference:

Rick Lauber, Chair  
Capt. Bill Anderson for RADM Rufe  
Linda Behnken  
David Fluharty  
Ron Hegge  
Bob Mace

Al Millikan for Robt. Turner  
Steve Pennoyer  
Wally Pereyra  
Carl Rosier  
Robin Samuelsen  
Clem Tillion

#### The following persons participated in the call at several listening sites:

Lisa Lindeman, NOAA-GC  
Chris Oliver, NPFMC  
Dave Ackley, ADF&G  
Dave Witherell, NPFMC  
Sue Salvesson, NMFS-AKR  
Jay Ginter, NMFS  
Galen Tromble, NMFS  
Joe Terry, NMFS-AFSC  
Thorn Smith, NPLA  
Chris Blackburn, AGDB  
Lance Farr, ACC  
Jim McManus, Trident  
Gordon Blue, F/V Zolotoi  
Fran Bennis, AMCC  
Kaja Brix, NMFS-AKR  
Ellen Varosi, NMFS-AKR  
Arni Thomson, ACC  
Tom Casey, AFCC  
John Henderschedt, Golden Age Fisheries  
Mike Petersen, NPF  
Clyde Sterling, Peter Pan  
Jerry Reeves, NMFS-AFSC  
Brent Paine, UCB  
Dave Fraser, F/V Muir Milach  
Dave Benton, ADF&G  
Earl Krygier, ADF&G  
John Winther  
Bill Coffey

Larry Cotter, Pacific Associates  
Peggy Murphy, ADF&G  
Ken Griffin, ADF&G  
Jie Zheng  
Brad Stevens, NMFS-RACE  
Tom Pearson, NMFS  
Dan Urban, ADF&G  
Leslie J. Watson, ADF&G  
Ludger Dochtermann, KLVOA  
Richard Thummel, KLVOA  
Linda Kozak, KLVOA  
Al Burch, ADA  
Mark Kandianis, Kodiak Fish Co.  
Teresa Kandianis, Kodiak Fish Co.  
John Pfeifer, Alaska Fisheries Report  
Bruce Gnad, Diamond Head, Inc.  
David Hillstrand, F/V Time Bandit  
Paul Seaton, Homer  
Max Mitchell, Homer  
Mark Mikols, Homer  
Mike Tolva, Homer  
Debra Rehder, Homer  
Jeff Stephan, UFMA  
Bill English  
Scott Highleyman, AMCC  
Mako Haggerty, NPF  
Bill Noll, Cold Sea Int'l

**Crab Bycatch**

In September, the Council received a status report on crab stocks from the Crab Plan Team. Results from the 1994 Eastern Bering Sea crab survey indicated that female red king crab abundance in Bristol Bay was below threshold. As a result, the State did not open the directed pot fishery for Bristol Bay red king crab, and prohibited fishing for Tanner crab east of 163°W longitude. In their report to the Council, the Crab Plan Team recommended that the red king crab PSC cap east of 163°W longitude be set at zero (which effectively eliminates trawling). The Council did not take action in September, but requested that additional data on crab bycatch in the groundfish fisheries in this area be provided for the teleconference, at which time the Council would make a recommendation on possible emergency action to close areas to groundfish trawling to protect red king crab.

The draft discussion paper, "An analysis of red king crab bycatch in the Bering Sea with alternatives for trawl closures," was prepared by ADF&G staff and mailed to Council members and listening sites before the conference. Dave Ackley briefly reviewed the discussion paper for Council members during the call and answered questions regarding the analysis.

Public comments were submitted in writing by the following people and organizations:

Golden Age Fisheries

John Hillstrand

Nancy Hillstrand

Olof Vedoy

Bruce Gnad

Debbie Rehder

Mike Tolva

David Hillstrand

Alaska Fisheries Conservation Group

Kodiak Fish Company

Johnathan Hillstrand

Alaska Crab Coalition

Pacific Northwest Crab Industry

Advisory Committee

Petition signed by 12 Sitka residents and

1 Anchorage resident to decrease all crab  
bycatch in the Bering Sea

City of Unalaska

Dave Fraser

Gordon Blue

John Gauvin

The following people gave oral testimony on this subject:

Arni Thomson, ACC

Dave Fraser, F/V Muir Milach

Mark Kandianis, Kodiak Fish Co.

John Winther

Jeff Stephan, UFMA

John Henderschedt, Golden Age Fisheries

David Hillstrand

Bill Noll, Cold Sea Int'l

Gordon Blue, F/V Zolotov

**Council Discussion/Action**

During public comment, Arni Thomson, representing the Alaska Crab Coalition, told Council members that their organization supports an industry-negotiated closure for the area bounded by 56°10' to 57°N latitude, and from 162° to 164°W longitude. This area would encompass a major area of king crab bycatch. Mr. Thomson said the analysis shows that areas to the southeast may involve more bycatch of *bairdi* and could increase halibut bycatch, but the industry compromise as a whole is acceptable for an emergency rule and the industry wants it in place for the 1995 season.

**DRAFT Summary**  
**Crab Bycatch Teleconference**  
**November 14, 1994**

**Bob Mace moved to request an emergency rule based on the industry compromise as stated by Arni Thomson:**

**Close the areas bounded by 56° 10' to 57°N latitude and from 162° to 164°W longitude.**

**The motion was seconded by Wally Pereyra.**

**It was pointed out that other aspects of the industry compromise included:**

- 100% observer coverage;**
- Daily catch reporting.**

**Mr. Mace indicated these requirements would be included in the motion.**

**The Council discussed whether the motion should apply to all trawling or bottom trawling only. Capt. Anderson said that for enforcement purposes, a closure to all trawling in a specific area would be preferable—even with the 100% observer coverage.**

**Mr. Rosier pointed out that the issue is not just protection of red king crab, but that Tanner crab are also involved and that he feels the current motion does not do enough to promote conservation.**

**Carl Rosier moved to amend the motion to change the southern boundary to: 55° 45'N latitude. The motion was seconded by Linda Behnken.**

**Mr. Rosier cited the necessity of providing a "buffer" area in terms of redistribution of the fleet from the closed areas.**

**Dr. Pereyra said that the Council needs to begin to address the entire issue of crab, including predation, habitat, disease and handling mortality. He also suggested that the Council consider some kind of sliding cap which would move up and down along with abundance estimates.**

**Mr. Pennoyer said he agreed that the Council needs to take action to protect the king crab in the area, but extending the closure to 55°45'N would encompass a major portion of the area where the rocksole fleet operates and he is concerned about where that effort may shift to.**

**Linda Behnken moved to amend the motion to apply the closures to all trawling, based on comments made by Capt. Anderson regarding enforcement. The motion was seconded by Ron Hegge and carried 7 to 4, with Fluharty, Mace, Millikan and Pereyra voting no.**

**The Chair ruled that this amendment was to the entire motion, not just the previous amendment.**

**Mr. Rosier's motion to amend to 55° 45' carried, 6 to 5, with Fluharty, Mace, Millikan, Pennoyer and Pereyra voting no.**

**There was a question about the timing of the closure. It was clarified that it would be an emergency rule - effective for 90 days, renewable for another 90 days. Steve Pennoyer suggested that during the first 90 days the Council could review available information on possible impacts of the closures on other fisheries, for example, flatfish.**

**Mr. Pennoyer also requested clarification of the requirement of 100% observer coverage, pointing out that the majority of the rock sole fleet already is required to have 100% coverage.**

**DRAFT Summary  
Crab Bycatch Teleconference  
November 14, 1994**

Linda Behnken said that her understanding is that the 100% observer coverage requirement would apply to all flatfish fisheries in areas 516 and 511, between 165° and 162°.

Linda Behnken moved that 100% observer coverage would apply to all flatfish fisheries between 162° and 165°W longitude, and south of 58°N latitude to protect crab in areas where there is a cap and other fisheries taking place. The motion was seconded by Ron Hegge.

Steve Pennoyer said he would prefer to split out the observer coverage provision and discuss it during the course of a regular Council meeting.

The amendment carried, 6 to 5, with Mace, Millikan, Pennoyer, Pereyra and Lauber voting no.

The main motion, as amended, carried, 7 to 4, with Fluharty, Millikan, Pereyra and Lauber voting no.

Summarized, the approved emergency rule has the following provisions:

1. Prohibit all trawling in the area from 162° to 164°W longitude, 55°45' to 57°N latitude.
2. Require 100% observer coverage with daily catch reporting on all trawlers fishing in Areas 511 and 516.

**Other Trawl VIP Standards**

At the September Council meeting, representatives from the trawl industry proposed a program to increase codend mesh sizes used in the rock sole fishery. The program would be voluntary, as mesh size regulations (and the related changes to the VIP other trawl category) recently adopted by the Council would not be in effect until about mid-1995. One reason fishermen have not voluntarily increased their mesh size in the past was the resulting possibility of exceeding VIP rate standards. As such, fishermen have requested the Council to consider increasing the bycatch rate standards for the BSAI other trawl category for the first half of 1995.

Sue Salveson, NMFS-Alaska Region, briefly reviewed current VIP standards for the Other Trawl category. Dave Fraser, David Hillstrand, and Mark Kandianis testified on this subject.

**Council Discussion/Action**

Council members felt that they did not have enough information to take action at this time. Steve Pennoyer said he did not know what the effects would be of not taking action in view of the larger mesh sizes industry will use next year. Status quo will leave all fisheries in the "other trawl" category at the 30% rate.

Carl Rosier moved to table the issue for discussion at a regularly-scheduled Council meeting. The motion was seconded by Bob Mace and carried without objection. (Dr. Pereyra had left the teleconference before this vote was taken.)

The teleconference was concluded at approximately 12:29 p.m.

## Discussion Paper: Snow Crab (*C. opilio*) Bycatch in the Groundfish Trawl Fisheries

Prepared by NMFS and Council Staff

In June, the Council reviewed information on *Chionoecetes opilio* (snow crab) bycatch in the BSAI groundfish fisheries. NMFS data showed that a total of 14,476,797 snow crabs were caught as bycatch in the 1992 BSAI trawl fisheries (Table 1). The data also showed that bycatch in the groundfish fisheries is concentrated in regulatory areas 513 and 514 (Table 2), which are shown in Figure 1. No size information on these crabs was provided, however, making it difficult to estimate the impacts of bycatch on the directed snow crab fishery.

The Council requested staff to provide additional information on snow crab bycatch for the September meeting. Specifically, the Council requested information on the following: historical bycatch by fishery, breeding habitat, bycatch mortality, percentage of total biomass, percentage of TAC, information on age composition and adult equivalents, bycatch avoidance potential like the Sea State Program, and observer methodology and identification. This discussion paper was written to summarize available information, which should assist the Council with determining whether or not a comprehensive analysis of PSC caps or other program is warranted.

### Snow Crab Biology

Snow crabs are distributed on the continental shelf of the Bering Sea, Chukchi Sea, and in the western Atlantic Ocean as far south as Maine. In the Bering Sea, snow crabs are rare at depths greater than 200 meters. The eastern Bering Sea (EBS) population within U.S. waters is managed as a single stock, however, the distribution of the population extends into Russian waters to an unknown degree.

Growth patterns of snow crab in the EBS are extremely complex and not well understood. While 50% of the females are mature at 50 mm, the mean size of mature females varies from year to year over a range of 63 mm to 72 mm carapace width (CW). Breeding habitat can be inferred from the distribution of female snow crab larger than 50 mm CW (Figure 2). Females cease growing with a terminal molt upon reaching maturity, and rarely exceed 80 mm CW. Males similarly cease growing upon reaching a terminal molt when they acquire the large claw characteristic of maturity. The median size of maturity for males is 65 mm CW (approximately 4 years old). Males larger than 60 mm grow at about 20 mm per molt, but individuals vary widely in this regard.

Only adult males are harvested. Average sizes of crab taken in the EBS fishery ranged from 105 mm to 118 mm (0.5 kg to 0.63 kg) for the years 1977 to 1994. Only 1% of snow crabs in the fishery exceed 140 mm. The legal size limit is 78 mm and is thought to allow at least one opportunity to breed based upon a median size of maturity of 65 mm CW. Small males are not marketable and processors generally do not purchase crabs smaller than 102 mm CW (4.0 inches).

Female snow crabs are able to store spermatophores in seminal vesicles and fertilize subsequent egg clutches without mating. At least two clutches can be fertilized from stored spermatophores, but the frequency of this occurring in nature is not known. Presumably this reproductive strategy evolved to maintain reproductive potential of populations at times when distributional factors prevent females from finding mates. Because of this reproductive strategy, fishery managers may not need to be as concerned with sex ratios of adult snow crab as they are with respect to king crab.

Snow crab feed on an extensive variety of benthic organisms including bivalves, brittle stars, crustaceans (including other snow crabs), polychaeta and other worms, gastropods, and fish. In turn they are



consumed by a wide variety of predators including Pacific cod, halibut and other flatfish, eel pouts, sculpins, and skates. In the northern part of their range, they are preyed upon by bearded seals and sometimes make up all of the seal's stomach contents.

### Snow Crab Abundance and Landings

Abundance of snow crab increased dramatically from 1983 to 1991 (Table 3), but has since declined. The 1993 NMFS Bering Sea trawl survey indicated the total abundance of large males (over 4 inches) at 135 million crab, a 48% decrease from 1992 (Table 4). Small (3-4") legal-size males also declined in abundance, consistent with the decline in large males observed since 1991. A continued westward shift of the population was also observed, with the highest sampling densities north and west of the Pribilof Islands. Abundance of small female crab increased 66% in 1993 and sublegal (<3.1") male-crab showed a 92% increase in abundance. Recruitment of these small crab should result in increased snow crab landings in 1995 or 1996 (Stevens et al. 1993, Morrison and Gish 1994).

Landings from the directed snow crab fishery increased steadily from 11,852 tons in 1983 to 73,402 tons in 1990, then jumped to 149,073 in 1991. Landings have since declined, with 1992 landings of 143,020 tons (227.4 million crab), 104,700 tons in 1993, and only 67,938 tons (114.8 million crab) in 1994. Participation in the fishery, as measured by numbers of vessels, has increased steadily since the mid-1980's, with 254 vessels participating in 1993 and a record high 273 vessels in 1994. Combined with a declining exploitable biomass, seasons are becoming shorter in duration. The 1993 fishery lasted only two months from January 15 - March 15. A summary of 1993 regulations is shown in Figure 3.

### Bycatch of Snow Crab in the Groundfish Trawl Fisheries

Crab bycatch is estimated by the National Marine Fisheries Service through the Observer Program. Bycatch data for crab are available for the 1991, 1992, and 1993 groundfish trawl fisheries in the BSAI and GOA trawl fisheries by target fishery and regulatory areas (Table 5), which are shown in Figure 1. The observer database categorizes crab bycatch into king crab, Tanner crab (*C. bairdi*), and "other" crab categories. In the Bering Sea, the "other crab" is comprised almost entirely of snow crab, whereas in the GOA, "other" crab consists mostly of *C. tanneri* and *C. angulatus*, with the bycatch of snow crab virtually nil. Bycatch of "other" crab in the GOA trawl fisheries is relatively low for the years examined (less than 30,000 crabs per year), so this analysis focuses primarily on BSAI fisheries. Bycatch of snow crab in BSAI groundfish fisheries totalled 10.5 million crabs in 1991, 14.5 million crabs in 1992, and 14.8 million crabs in 1993. Data show that the yellowfin sole fisheries in 513 and 514 consistently have the highest bycatch in numbers of snow crab, followed by the rock sole/other flatfish target fishery in the same areas. Together, these fisheries accounted for 5,629,807 crabs (54%) of the BSAI snow crab bycatch in 1991, 12,779,142 (88%) in 1992, and 13,726,499 (87%) in 1993. Much of the 1991 remainder was taken by pollock fisheries in statistical area 521.

Length frequencies of crab taken as bycatch, provided by the NMFS Observer Program, indicate that size of snow crab bycatch depends on year, target fishery, and regulatory area. Data summarizing snow crab bycatch length frequency for 1991, 1992, and 1993 trawl fisheries in regulatory areas 511, 513, 514, 517, 521, and 522 was provided, and are shown in Figures 4-9. As previously stated, the highest bycatch in numbers occurs in the yellowfin sole and other flatfish fisheries in areas 513 and 514. The size of snow crab taken is generally small, with most crab about 40-80 mm (1.6"-3.1") in carapace width. In 1991, *Opilio* taken as bycatch were generally larger (to 140 mm) in these two areas. In the other regulatory areas (511, 517, 521, and 522), fewer crab were taken as bycatch in all years, but all sizes of crab were represented. Marketable size crab (>102 mm) were taken in bottom pollock, rock sole, and other flatfish fisheries in other areas in 1991 and 1992.

Conversion of length data to age data for purposes of estimating snow crab bycatch as a percentage of total biomass and snow crab GHL would require additional analysis. However, for reference, respective abundance estimates for 1991, 1992, and 1993 were 11.3 billion, 7.8 billion, and 11.7 billion snow crabs of all sizes in the Bering Sea (Stevens et al. 1993). Corresponding BSAI snow crab bycatches were 10.5 million, 14.5 million and 14.8 million crabs, or 0.09%, 0.19%, and 0.13% of the total crab available in those years.

### Discard Mortality

Few studies have estimated mortality of crabs taken as bycatch and discarded. One hundred percent mortality is assumed for Tanner crab and king crab bycatch in groundfish fisheries. For Tanner crab taken as bycatch in the weathervane scallop fishery, Urban et al. (1994) recorded that 13-35% were dead or moribund before being discarded, with the highest mortality rate occurring on small (< 40 mm cw) and large (>120 mm cw) crabs. Delayed mortality resulting from injury or stress was not estimated. In the directed crab pot fishery, handling mortality of trap-captured crabs has been assumed to be negligible (Schmidt and Pengilly 1993).

In a study of crab taken from research trawls, Hays (1973) tested snow crab for discard mortality. Large males (> 110 mm CW) were held on deck in air (5 to 10 degrees C.) to simulate handling in Japanese commercial fisheries. The results were as follows:

Storage time (hrs):	0	6	12	24	48
No. alive/No. held:	8/10	10/10	7/10	3/10	0/10

Stevens (1990) studied the survival of red king crab and Tanner crab in sole fisheries and found that overall survival (including delayed mortality) was 21 to 22% for crab that were taken in an August joint-venture fishery and delivered to a processing vessel. Delayed mortality of both species increased with total time in captivity. Mortality of king crab increased with size of trawl catches, but mortality of Tanner crab was not affected. However, mortalities would be expected to be much higher during the molting period and immediately after it, when crab are soft. Data collected by Stevens (1990) were done on hardshelled crab, and may not be representative of other times of the year. Unlike king and Tanner crab, EBS snow crab molt in the summer (June and early July) and molting occurs somewhat later in more northerly areas. Higher discard mortality rates for snow crab may thus be expected in the summer months.

### Bycatch Avoidance Program

A bycatch avoidance program for snow crab, like the Sea State Program for salmon, may not be a viable alternative at this time. A potential problem is that observers are already fully utilized. In addition to collecting, compiling, and analyzing biological information, the Sea State program has burdened the observer program with additional duties. A program for snow crab may be more complicated than salmon (i.e., more data to collect, enter, and analyze), and may result in re-prioritizing observer duties away from collecting biological data (e.g. length frequency information) from the fisheries (J. Berger, NMFS, personal communication).

### PSC Caps

Establishing a prohibited species (PSC) cap could be considered as an alternative to restrict the amount of snow crab taken as bycatch in the groundfish fisheries. Current regulations for the BSAI and GOA groundfish fisheries provide a number of regimes to manage the incidental take of PSC, or bycatch of Pacific halibut, Pacific herring, Pacific salmon, Steelhead trout, and King and Tanner crab. One example

of bycatch management would be time and area closures triggered by attainment of an established PSC limit. PSC limits can be in the form of a percentage of biomass, such as herring in the BSAI, an established number, as with king and Tanner crab in the BSAI, or an estimated mortality rate, as with halibut in both the BSAI and GOA.

Fisheries are closed when PSC caps are reached. For example, the 1994 rock sole/other flatfish trawl fishery was closed on February 25 in Zone 1 (Areas 511, 512, 516) due to attainment of the red king crab PSC cap; Zone 2 (Areas 513, 517, and 521) was closed to this fishery on May 7 due to attainment of the Tanner crab PSC cap. Costs associated with establishing PSC caps would depend on how high the caps are set relative to crab biomass; low caps could have substantial impacts on groundfish fisheries.

Bycatch from trawl fisheries accounts for a very small portion of the total BSAI snow crab abundance, in the order of 0.1 to 0.2% yearly. Proportionally, this bycatch is less than for other crab species with PSC caps. In 1993, bycatch of PSC crab in trawl fisheries totalled 183,713 red king crab and 3,374,031 Tanner crab. Existing PSC crab caps for the BSAI trawl fisheries total 200,000 red king crab and 4,000,000 Tanner crab. Corresponding 1993 abundance was 38.8 million Bristol Bay red king crab and 254.9 million EBS Tanner crab of all sizes (Stevens et al. 1993). Hence, the caps represented 0.5% and 1.6% of the total number of BSAI king and Tanner crab, and the overall BSAI bycatch represented 0.5% and 1.3% of red king crab and Tanner crab, respectively.

#### Other Bycatch Restrictions

There are other methods to restrict the amount of bycatch taken. One program that has been established is the vessel incentive program (VIP) for the BSAI and GOA trawl fisheries. Enforcement of the VIP standards has proven difficult, and may not hold much potential for reducing snow crab bycatch. Another method that has been used to reduce bycatch has been to adjust seasonal starting dates for some groundfish fisheries in order that the fisheries are conducted during a time of relatively lower bycatch rates. Time/area closures may have some potential to reduce snow crab bycatch. The Council recently established hotspot time/area closures for chum salmon, and a permanent area closure to trawl gear to protect blue king crab around the Pribilof Islands. Although the highest snow crab bycatch occurs in statistical areas 513 and 514, additional analysis may identify more discrete areas of high bycatch (hotspots).

#### Literature Cited

- Hays, M.L. 1973. Survival of Tanner crabs (*Chionoectes bairdi*) after capture in trawls and subsequent handling and storage aboard fishing boats. International North Pacific Fisheries Commission. 9p.
- Morrison, R. and R.K. Gish. 1994. Annual Management Report for the Shellfish Fisheries of the Bering Sea Area, 1993. Alaska Department of Fish and Game Regional Information Report No. 4K94-29. July 1994.
- Schmidt, D.C. and D. Pengilly. 1993. Review of harvest strategies used in the management of lithoid crab in Alaska. In: Kruse, Eggers, Marasco, Pautzke, and Quinn (Editors). Proceedings of the International Symposium on Management Strategies for Exploited Fish Populations, Alaska Sea Grant College Program, AK-SG-93-02:385-407.
- Stevens, B.G. 1990. Survival of king and Tanner crabs captured by commercial sole trawls. Fishery Bulletin 88:731-744.
- Stevens, B.G. R.A. MacIntosh, J.A. Haaga, and J.H. Bowerman. 1993. Report to the Industry on the 1993 Eastern Bering Sea Crab Survey. NMFS-AFSC 93-14.
- Urban, D, D. Pengilly, and I. Vining. 1994. The scallop observer program and statewide data analysis summary to the Board of Fisheries. Alaska Department of Fish and Game, Kodiak. 54 p.

Table 1. 1993 Bycatches (numbers of animals) of *Opilio Tanner* Crab occurring in trawl fisheries for groundfish in the Bering Sea/Aleutian Islands and Gulf of Alaska Management Areas.

BERING SEA/ALEUTIAN ISLANDS	
<u>Target Fisheries</u>	<u>Number</u>
Pollock	727,177
Pacific cod	165,638
Rock Sole/Other flatfish	4,257,881
Yellowfin sole	<u>9,326,101</u>
Total	14,476,797
GULF OF ALASKA	
Rockfish	2,591
Deep water flatfish	454
Shallow water flatfish	2,571
Sablefish	<u>78</u>
Total	5,694

Table 2. 1993 Bycatches (numbers of animals) of *Opilio Tanner* Crab occurring in the rocksole/"other flatfish" and yellowfin sole target fishery categories by reporting area in the Bering Sea/Aleutian Islands management area.

<u>Target Fisheries</u>	<u>Reporting Area</u>	<u>Number</u>
Rock Sole/Other flatfish	508	0
	509	2731
	513	2,752,190
	514	1,116,592
	516	1,449
	517	16,038
	519	0
	521	110,515
	523	0
	524	258,367
	540	<u>0</u>
	Total	4,257,882
Yellowfin Sole	508	0
	509	8,468
	513	5,167,494
	514	3,797,439
	516	0
	521	0
	524	<u>352,700</u>
Total	9,326,101	

Year	QIL <sup>a</sup>	Season Total <sup>a</sup>	Number of		Number of Pots		Value		Season Length <sup>d</sup>
			Vessels	Landings	Registered <sup>b</sup>	Pulled	Exvessel	Total <sup>c</sup>	
1979/80	N/A	39.3	134	597	35,503	255,022	\$ 0.21	\$ 83.0	307
1981	39.5-91.0	50.5	153	867	39,789	435,742	\$ 0.26	\$ 13.1	229
1982	16.0-22.0	28.3	112	803	35,522	469,091	\$ 0.73	\$ 20.7	167
1983	15.8	24.8	109	462	15,39	287,127	\$ 0.35	\$ 8.7	120
1984 <sup>e</sup>	49.0	26.0	52	367	12,493	173,591	\$ 0.30	\$ 7.8	320
1985 <sup>e</sup>	98.0	64.9	75	718	15,325	372,045	\$ 0.30	\$ 19.5	333
1986 <sup>e</sup>	57.0	96.6	88	992	13,750	543,744	\$ 0.60	\$ 60.0	252
1987	56.4	100.9	103	1,038	19,386	616,113	\$ 0.75	\$ 75.7	158
1988	110.7	130.8	171	1,285	38,765	766,907	\$ 0.77	\$100.7	120
1989	132.0	147.6	168	1,341	43,607	663,442	\$ 0.75	\$110.7	112
1990	139.8	161.8	189	1,565	46,440	911,613	\$ 0.64	\$102.3	148
1991	315.0	325.2	228	2,788	76,056	1,391,583	\$ 0.50	\$162.6	159
1992	333.0	313.0	250	2,763	77,858 <sup>f</sup>	1,281,796	\$ 0.50	\$156.5	97
1993	207.2	230.8	254	1,836	65,081	971,046	\$ 0.75	\$171.9	59

<sup>a</sup>Millions of pounds.

<sup>b</sup>Same gear as *C. bairdii* fishery.

<sup>c</sup>Millions of dollars.

<sup>d</sup>In days.

<sup>e</sup>Partial closures only.

<sup>f</sup>Gear of *C. opilio* vessels only.

Table 4. Abundance estimates (millions of crabs) for eastern Bering Sea opilio crabs from NMFS trawl surveys, all districts combined (source: Stevens et al. 1993).

Size <sup>1</sup> (mm) Width (in)	Males				Females			Grand Total
	Large		V. Large	Total	Small	Large		
	<102 <4.0	≥102 ≥4.0	≥110 ≥4.3		<50 <2.0	≥50 ≥2.0	Total	
1982	*	*	22	2073	403	2256	2658	4732
1983	*	*	22	1858	673	1228	1913	3760
1984	1237	153	74	1391	610	582	1192	2583
1985	548	75	41	623	258	123	382	1004
1986	1179	83	46	1262	791	422	1212	2474
1987	4439	151	70	4590	2919	2929	5849	10438
1988	3467	171	90	3638	1235	2323	3556	7194
1989	3646	187	81	3833	1923	3791	5713	9546
1990	2860	420	189	3281	1463	2798	4261	7542
1991	3971	484	323	4455	3289	3575	6864	11319
1992	3158	256	165	3414	2434	1914	4348	7763
1993	5597	135	78	5732	3990	1983	5972	11704
East (%) <sup>2</sup>	54	47	52	54	48	48	48	51
<u>Limits<sup>3</sup></u>								
Lower	3391	104	60	3526	2523	1308	4021	7547
Upper	7802	166	96	7937	5457	2657	7924	15860
± %	39	23	23	38	37	34	33	35

<sup>1</sup> Carapace width (mm).

<sup>2</sup> Proportion of size group in Eastern District.

<sup>3</sup> Mean ± 2 standard errors for most recent year.

\* Estimates not available at present time.

Table 5. Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

BYCATCH OF OPILIO TANNER CRAB BY TARGET FISHERY AND ZONE

YEAR	BERING SEA AND ALEUTIAN ISLANDS			GULF OF ALASKA				
	TARGET FISHERIES	ZONE	NUMBER	TARGET FISHERIES	ZONE	NUMBER		
1993	ATKA MACKEREL	540	10	PACIFIC COD	610	511		
			10		620	2,082		
	POLLOCK BOTTOM	509	3,651	DEEP WATER FLATFISH	630	866		
			513		38,047	640	88	
			514		92,636	649	132	
			517		143,176	650	1	
			519		3,836	659	8	
			521		210,906			
			523		8,188			
			524		22,076			
						522,517		
	PACIFIC COD	509	5,005	SHALLOW WATER FLATFISH	620	75		
			512		45	630	2,439	
			513		6,332			
			514		96,282			
			517		6,243			
			518		120			
			519		1,889	ROCKFISH	610	2,075
			521		129,767		620	304
			523		4,102		630	133
			524		41,455		640	83
	540	685						
					2,595			
			291,924					
	ROCKFISH	509	54	OTHER SPECIES	610	4		
			519		6	620	65	
521			412		630	9		
523			4					
540			2					
541			1					
		479						
OTHER SPECIES	521	666	SABLEFISH	610	8,749			
		666		620	1,919			
POLLOCK	508	36		630	479			
				640	895			
				649	205			
				650	2,525			
			659	2,510				
				17,282				

Table 5 (continued). Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

MIDWATER	509	4,936	ARROWTOOTH FLOUNDER	610	13
	513	30,088			
	516	42			
	517	22,748			
	518	9			
	519	73			
	521	156,912			
	523	898			
	540	1			
		215,743			
ROCK SOLE/ OTHER FLATFISH	508	18			
	509	2,728			
	513	2,752,187			
	514	1,116,574			
	516	1,449			
	517	15,990			
	521	110,473			
	524	258,203			
		4,257,622			
SABLEFISH	517	16			
	518	94			
	519	36			
	521	1			
	540	384			
	541	169			
	542	28			
		728			
GREENLAND TURBOT	509	8			
	517	645			
	518	512			
	519	145			
	521	572			
	523	201			
	524	4			
	540	65			
		2,153			
YELLOWFIN SOLE	509	22,637			
	513	5,296,972			
	514	3,796,975			
	524	352,293			



Table 5 (continued). Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

		9,468,877			
NO RETAINED SPECIES	509	2			
		<hr/>			
		2			
<b>1992</b>					
	511	5,790			
POLLOCK	513	64,068			
BOTTOM	517	59,271			
	519	14,837			
	521	846,141			
	522	20,633			
		<hr/>			
		1,010,740			
PACIFIC COD	511	19,004	POLLOCK	610	261
	512	232	BOTTOM	620	148
	513	27,698		630	331
	514	276			<hr/>
	515	204			740
	516	27			
	517	32,634	PACIFIC COD	610	895
	518	1,731		620	180
	519	8,433		630	789
	521	166,058		640	7
	522	52,266		649	6
	540	673		659	3
		<hr/>			<hr/>
		309,236			1,881
ROCKFISH	518	1	DEEP WATER	620	176
	521	433	FLATFISH	630	423
	522	98			<hr/>
	540	225			599
		<hr/>	SHALLOW WATER	630	20
		756	FLATFISH		<hr/>
					20
OTHER SPECIES	511	6	ROCKFISH	610	24
	513	36		620	150
	519	1		630	64
	521	42		640	113
	522	99		650	75
		<hr/>			<hr/>
		184			426
POLLOCK	511	19,507	OTHER SPECIES	610	104
MIDWATER	512	1,838			

Table 5 (continued). Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

	513	184,218	630	15	
	514	140			
	515	2,540		119	
	517	45,253			
	519	1,035	SABLEFISH	610	4,324
	521	3,252,204		620	463
	522	52,187		630	1,186
	540	1,079		640	984
				649	70
		3,560,001		650	718
				659	918
ROCK SOLE/ OTHER FLATFISH	511	15,501			
	513	940,016			8,663
	514	1,179,596			
	516	421			
	517	12,516			
	521	21,816			
	522	473			
		2,170,339			
SABLEFISH	511	2			
	517	98			
	518	134			
	519	62			
	521	207			
	522	131			
	530	5			
	540	299			
		938			
GREENLAND TURBOT	519	4			
	540	3			
		8			
ARROWTOOTH FLOUNDER	519	700			
		700			
YELLOWFIN SOLE	511	42,458			
	513	5,894,074			
	514	4,216,946			
	521	449,563			
	522	5,761			
		10,608,803			

Table 5 (continued). Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

NO RETAINED SPECIES	511	59			
	514	786			
		<hr/>			
		845			
<b>1991</b>					
ATKA MACKEREL	515	22	POLLOCK	610	310
	517	685	BOTTOM	620	12
	519	17		621	31
	540	123		630	643
		<hr/>		650	3
		848			<hr/>
					999
POLLOCK BOTTOM	511	63,402	PACIFIC COD	610	318
	513	409,907		620	3
	514	6		621	7
	515	45,287		630	98
	516	122		640	1
	517	106,802		650	2
	519	83,220			<hr/>
	521	1,986,602			428
	522	992			
		<hr/>			
		2,696,339	DEEP WATER FLATFISH	610	94
PACIFIC COD	511	25,868		620	2,684
	513	2,016		630	85
	514	107			<hr/>
	515	7,175			2,863
	516	13	ROCKFISH	610	2,541
	517	92,352		620	311
	518	1,486		630	289
	519	2,551		640	72
	521	72,831		650	4
	522	7,334		680	4
	540	1,744			<hr/>
		<hr/>			3,221
		213,476	POLLOCK MIDWATER	610	2
ROCKFISH	513	2			<hr/>
	517	72			2
	521	795	SABLEFISH	610	531
	522	145		620	202
	540	47		621	1
		<hr/>		630	217
		1,061		640	262
OTHER SPECIES	511	2		650	481
				680	113

Table 5 (continued). Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.

	513	30,315	
	515	36	1,807
	517	613	
	519	279	
	521	29	
	522	903	
		<hr/>	
		32,177	
POLLOCK MIDWATER	511	3,001	
	513	66,534	
	515	12,281	
	517	31,180	
	518	2,015	
	519	15	
	521	1,544,616	
	522	24,043	
	540	2	
		<hr/>	
		1,683,686	
ROCK SOLE/ OTHER FLATFISH	511	47,012	
	513	2,590,826	
	514	2,809,310	
	515	4,271	
	516	4,295	
	517	12,340	
	519	528	
	521	81,723	
	522	79,480	
	540	22	
			<hr/>
		5,629,807	
SABLEFISH	511	1	
	515	24	
	517	6	
	518	8	
	519	1	
	521	2	
	522	1	
	540	70	
		<hr/>	
		114	
GREENLAND TURBOT	515	217,253	
	517	10,042	
	518	6,031	
	519	2,370	

Table 5 (continued). **Bycatch of opilio crab (in numbers) in groundfish fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1991-1993, by target fishery and zone.**

	521	220
	522	2
	540	2,174
		238,092
ARROWTOOTH	511	693
FLOUNDER	515	56
	517	2,408
	518	28
	519	-170
	521	19,252
	522	4,887
	540	126
		27,620

The targets for which there is no zone information had zero bycatch

Figure 1. Regulatory areas in the Bering Sea/Aleutian Islands and Gulf of Alaska.

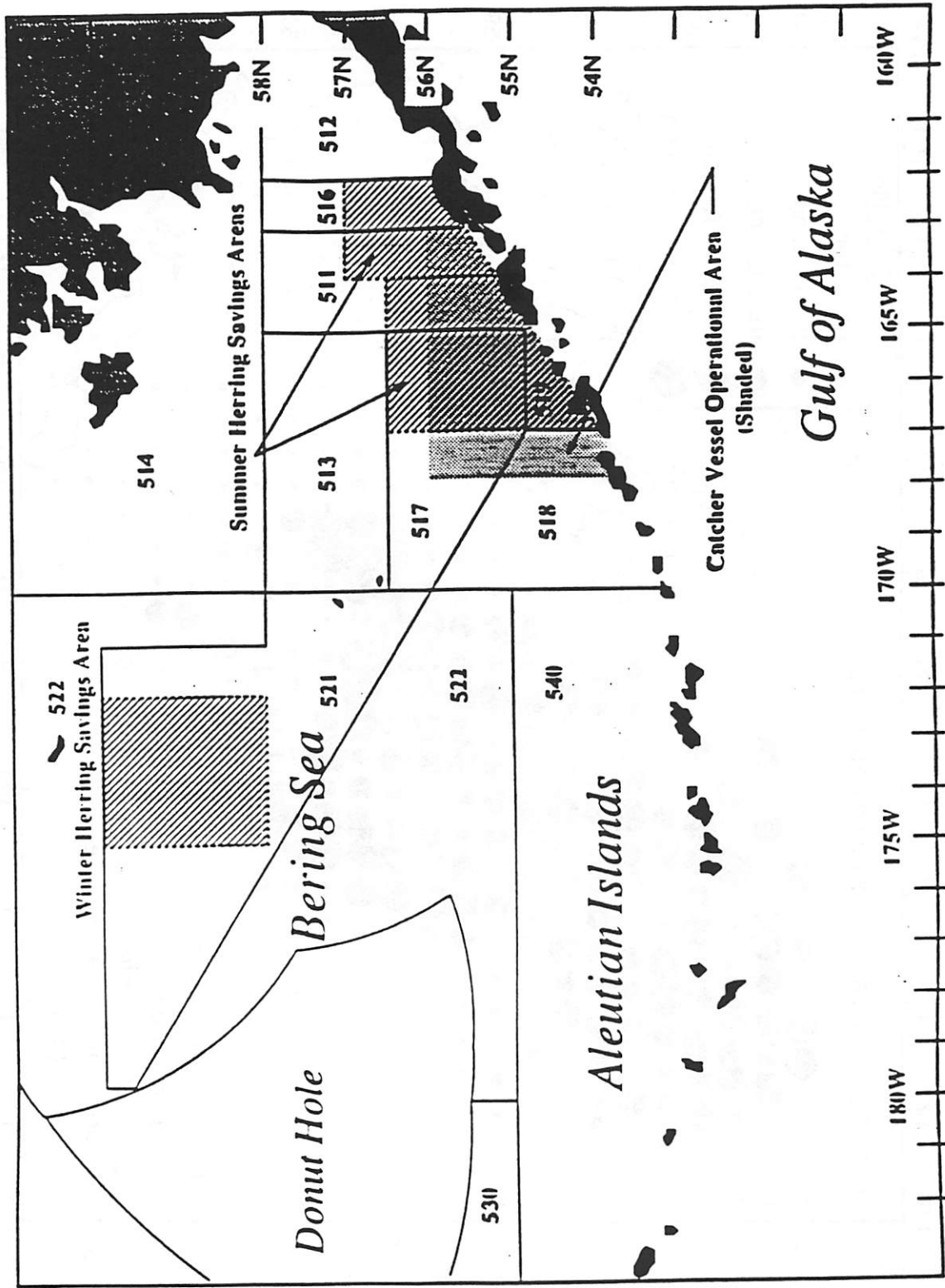


Figure 2. Distribution of female snow crab greater than 50 mm CW from the 1994 NMFS EBS crab survey.

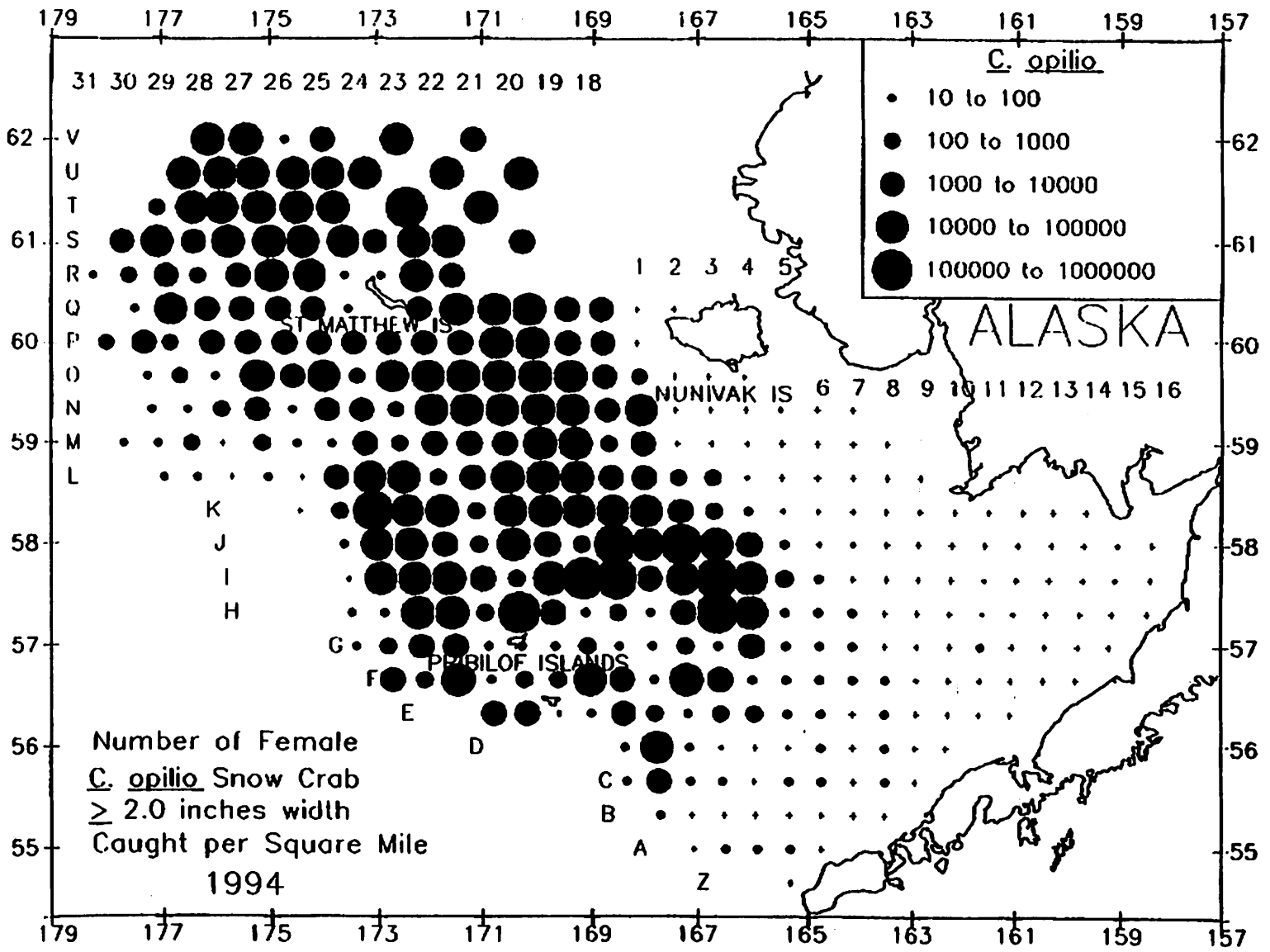
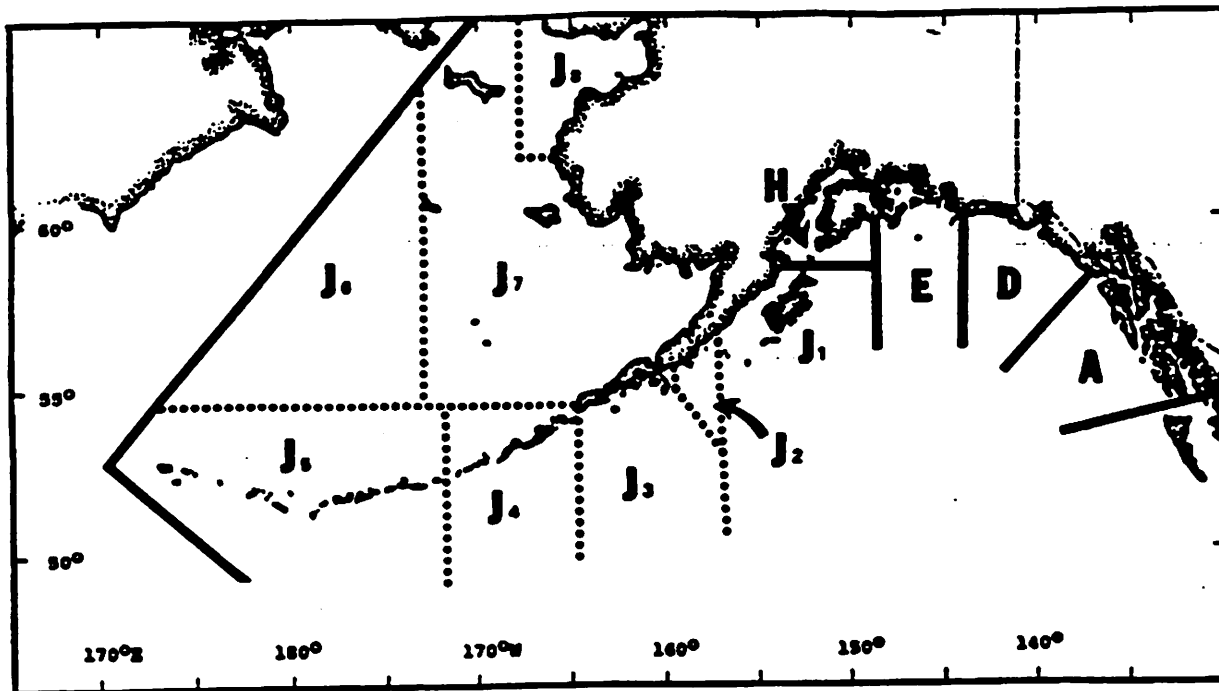


Figure 3. Summary of 1993 Tanner and snow crab regulations.



### TANNER CRAB SEASON REGULATIONS SUMMARY

**J8: BERING SEA DISTRICT EASTERN SUBDISTRICT NORTON SOUND SECTION**  
 Reg: No open season

**J7: BERING SEA DISTRICT EASTERN SUBDISTRICT**  
 Reg: Nonexclusive

Pot Limit:  
 250, for Vessels over 125 feet

200 for Vessels 125 or less

Dates: *C. bairdi* - East of 168° W. long., Concurrent With Area T.

Rod King Crab Season and reopen again 10 days after Area T king crab season between 163° and 173° W. long.

If no Area T king crab season, open between 163° and 173° W. long. on November 1.

*C. opilio* - January 15  
 Size: *C. bairdi* - 5.5 inches  
*C. opilio* - 3.1 inches

**J6: BERING SEA DISTRICT WESTERN SUBDISTRICT**  
 Reg: Nonexclusive  
 Pot Limit:  
 250, for Vessels over 125 feet

200 for Vessels 125 or less

Dates: *C. bairdi* - January 15  
*C. opilio* - January 15

Size: *C. bairdi* - 5.5 inches  
*C. opilio* - 3.1 inches

**J5: WESTERN ALEUTIANS**  
 Reg: Nonexclusive  
 Pot Limit: None  
 Dates: November 1  
 Size: *C. bairdi* - 5.5 inches

**J4: EASTERN ALEUTIANS**  
 Reg: Nonexclusive  
 Pot Limit: None  
 Dates: January 15  
 Size: *C. bairdi* - 5.5 inches

**J3: SOUTH PENINSULA**  
 Reg: Nonexclusive  
 Pot Limit:  
 40 or 75 Depending on GHJL  
 Dates: January 15  
 Size: *C. bairdi* - 5.5 inches

**J2: CHIGNIK**  
 Reg: Nonexclusive  
 Limit:  
 40 or 75 Depending on GHJL  
 Date: January 15  
 Size: *C. bairdi* - 5.5 inches

**J1: KODIAK**  
 Reg: Nonexclusive  
 Pot Limit: 75  
 Dates: January 15  
 Size: *C. bairdi* - 5.5 inches

**H: COOK INLET**  
 Reg: Superexclusive  
 Pot Limit: 40 or 75 depending on GHJL in Southern District  
 Dates: January 15  
 Size: 5.5 inches

**E: PRINCE WILLIAM SOUND**  
 Reg: Superexclusive  
 Pot Limit: 100 or 175 Depending on Area  
 Dates: January 15  
 Size: 5.3 inches

**D: YAKUTAT**  
 Reg: Nonexclusive  
 Pot Limit: 100 in Yakutat Bay  
 Dates: January 15  
 Size: 5.5 inches

**A: SOUTHEASTERN**  
 Reg: Superexclusive  
 Pot Limit: 100 Pot Limit in Inside Waters  
 Dates: February 15  
 Size: 5.5 inches

**KEY:**  
 Registration ..... Reg: Opening Dates ..... Dates:  
 Guideline Harvest Level .GHL Minimum Legal Size .... Size:



Figure 4. Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 511. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes.

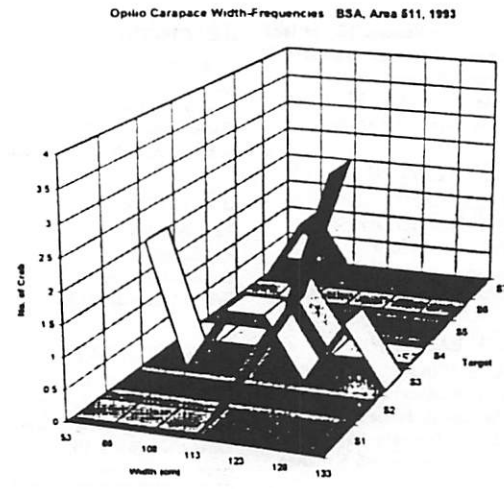
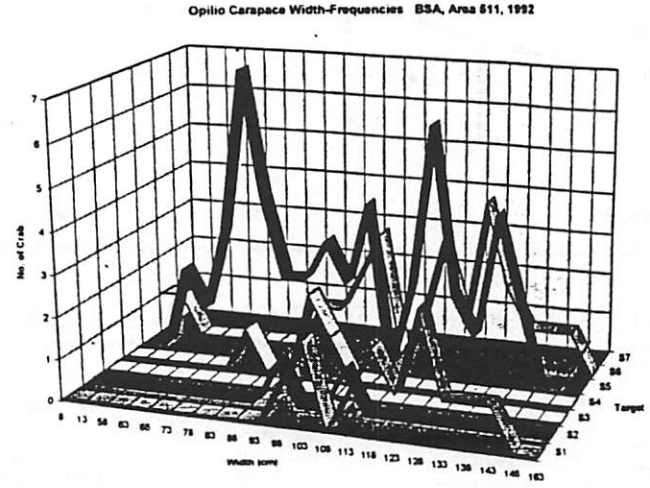
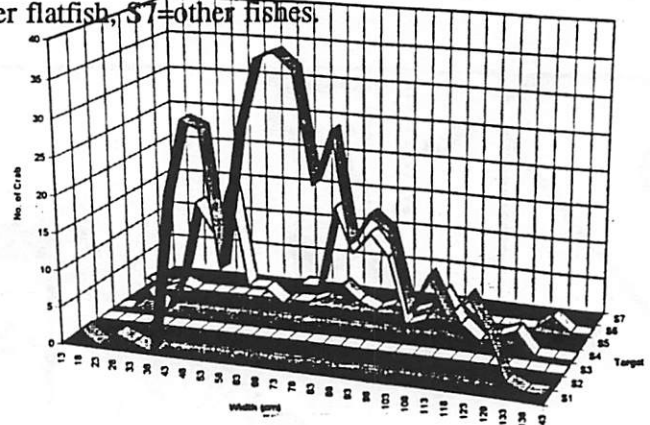
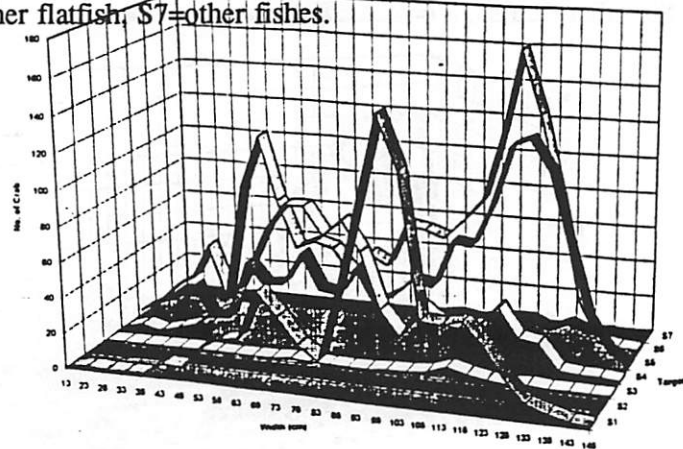
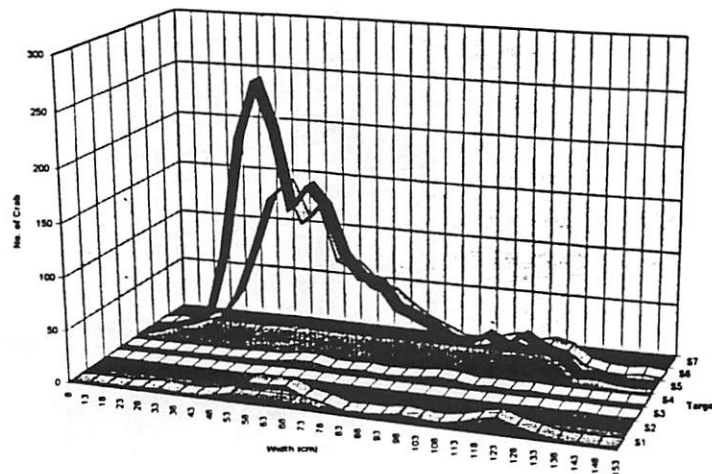


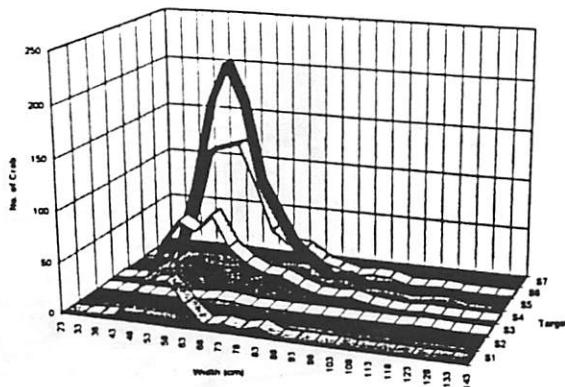
Figure 5. Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 513. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes.



Opilio Carapace Width-Frequencies BSA, Area 513, 1992



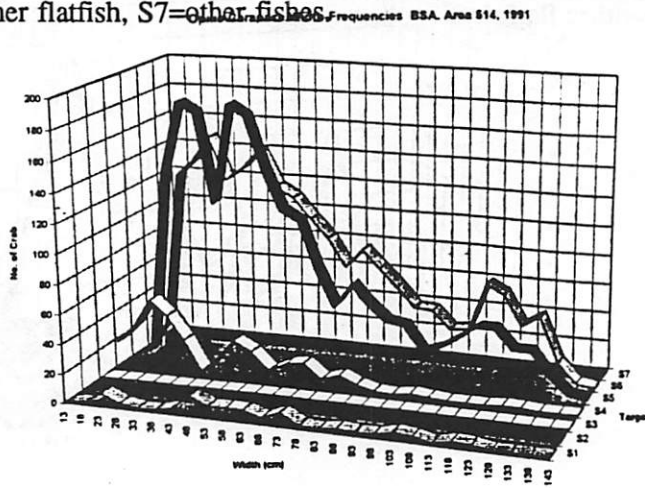
Opilio Carapace Width-Frequencies BSA, Area 513, 1993



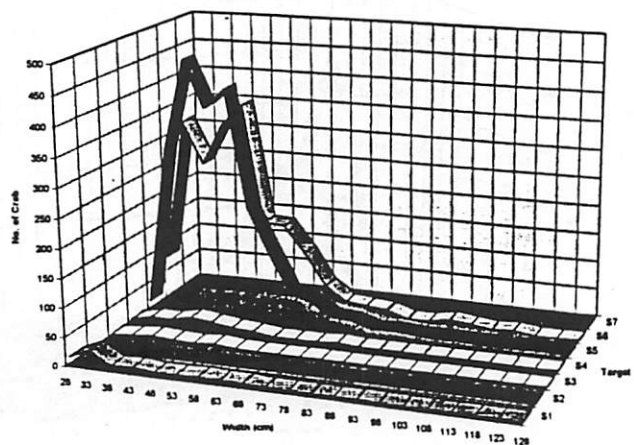
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- Series 6
- Series 7

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- Series 6
- Series 7

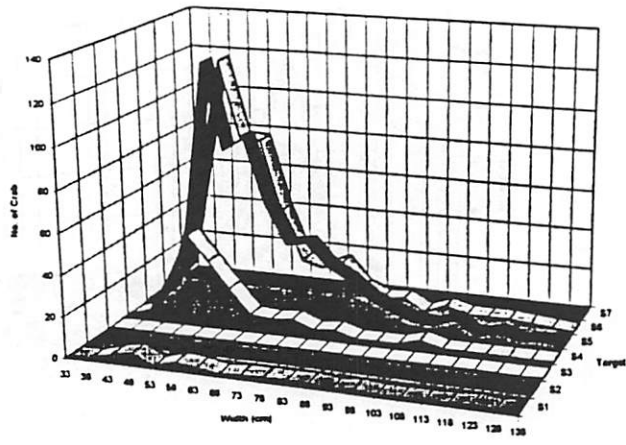
Figure 6. Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 514. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes



Opilio Carapace Width-Frequencies BSA, Area 514, 1992



Opilio Carapace Width-Frequencies BSA, Area 514, 1993



**Figure 7.** Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 517. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes

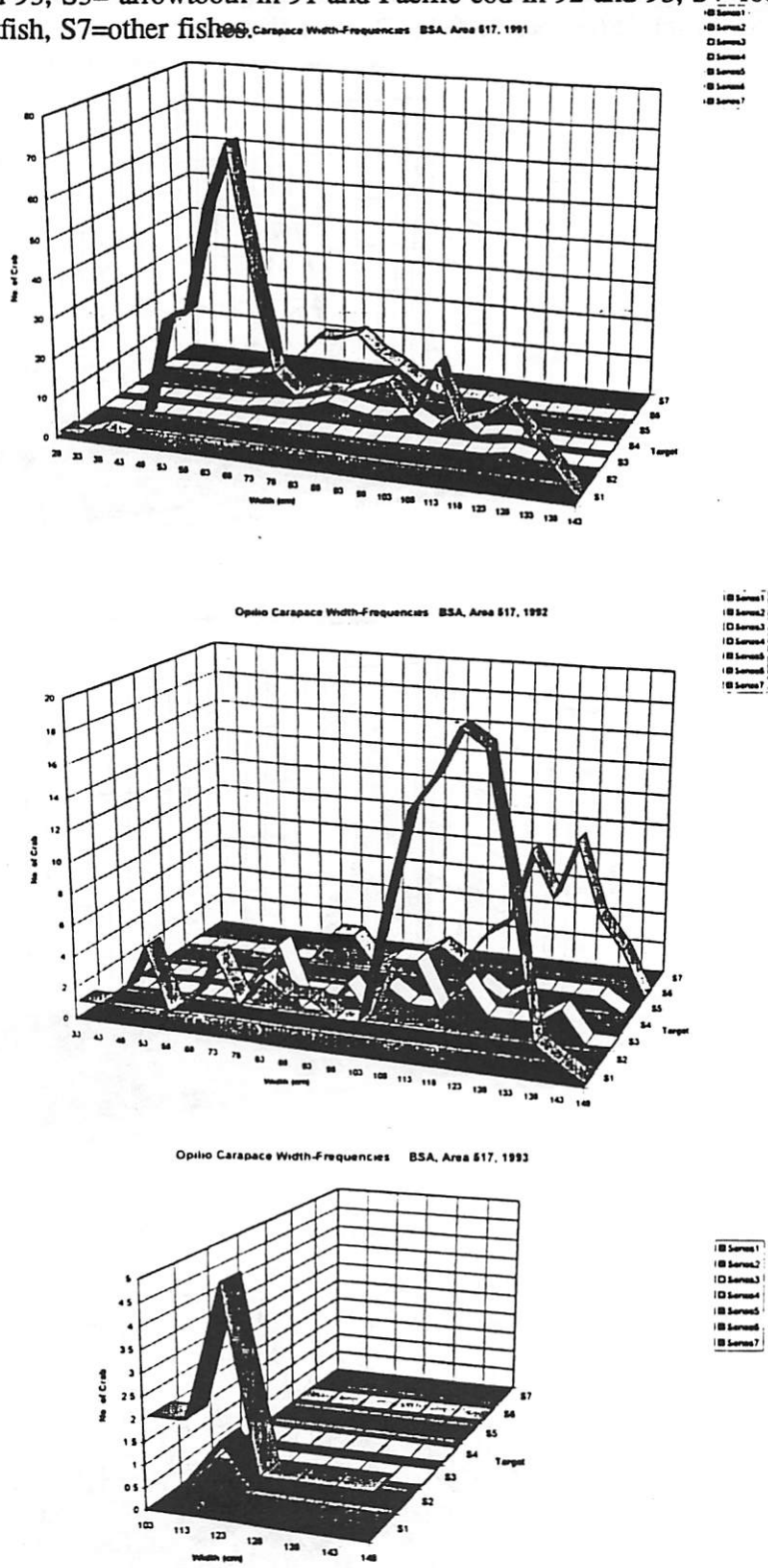
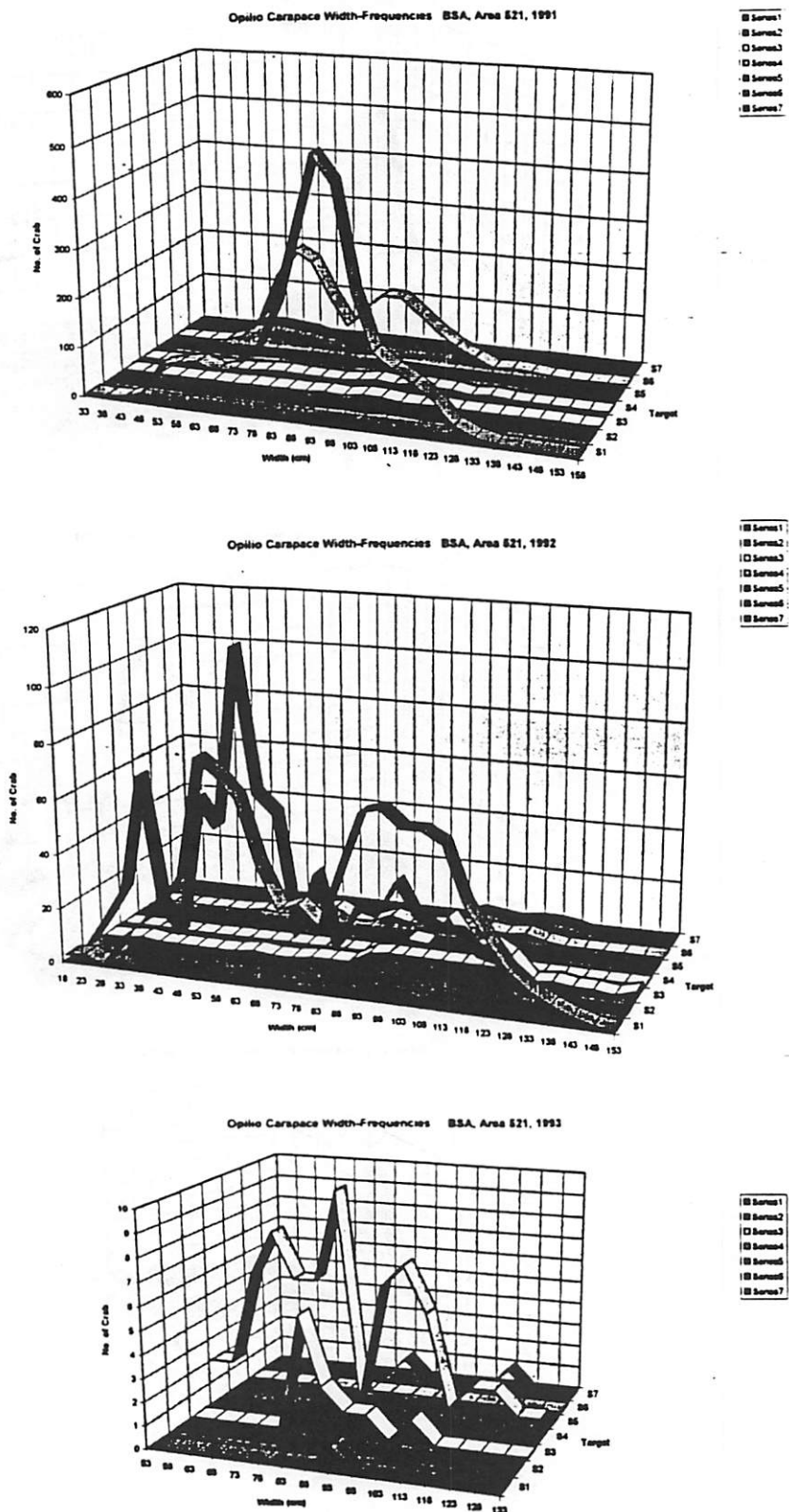
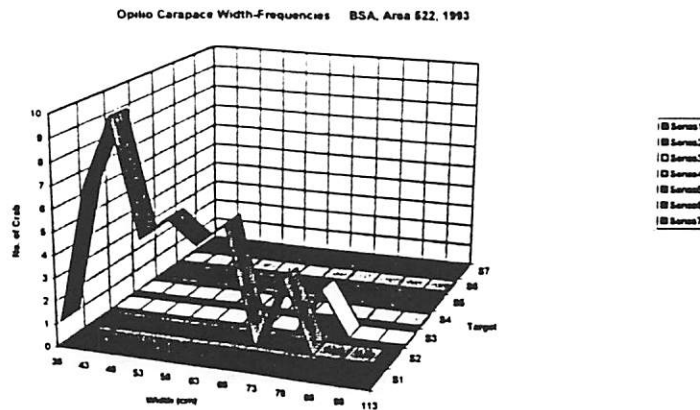
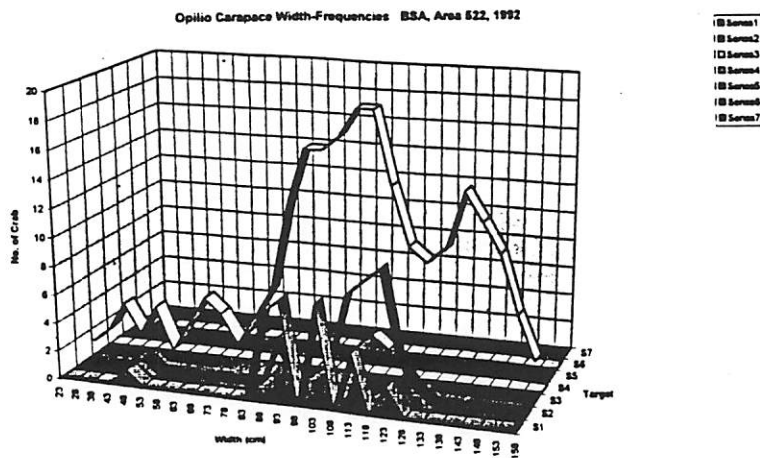
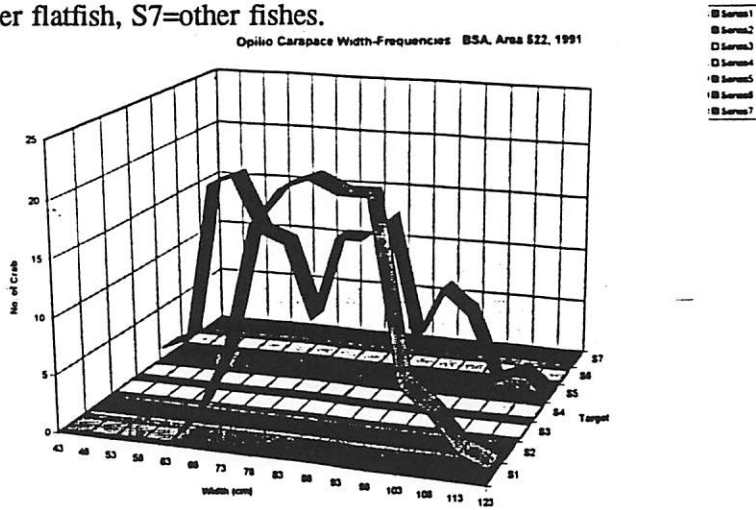


Figure 8. Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 521. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes.



**Figure 9.** Length Frequencies (carapace width, mm) of snow crab bycatch taken in 1991, 1992, and 1993 trawl fisheries in BSAI Regulatory Area 522. KEY to target fisheries: S1=bottom pollock, S2=turbot in 91 and pelagic pollock in 92 and 93, S3= arrowtooth in 91 and Pacific cod in 92 and 93, S4=rock sole, S5=yellowfin sole, S6=other flatfish, S7=other fishes.



**DISCUSSION OF THE IMPACTS ON BRISTOL BAY RED KING CRAB OF  
ROCK AND YELLOWFIN SOLE TRAWLING  
AND NON-ENFORCEMENT OF PSC.**

Prepared by the Homer Crab Group

November 26, 1994

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## INTRODUCTION

The Homer Crab Group is a group of concerned crab fishing vessel owners, operators, deckhands, and business persons in our area who have been researching available data for the effect of Rock and Yellowfin Sole trawling bycatch on the Bering Sea Red King Crab population.

The 1994 directed Bristol Bay Red King Crab fishery was closed due to lack of sufficient numbers of mature female crab. In addition, the Bairdi Tanner Crab season was truncated to approximately 50% by an area closure east of 163 Degrees West Longitude in a related conservation effort to reduce crab mortality associated with fishing effort.

It is apparent from NMFS estimates of crab abundance that in general crab stocks (Red and Blue King Crab, Bairdi and Opilio Tanner Crab) are at low levels. At these low levels of abundance, PSC (Prohibited Species Cap) and VIP (Vessel Incentive Program) rates established when stocks were much healthier appear to be inappropriate. PSC and VIP rates should be indexed annually to the relevant stocks directly, that is if the prohibited species abundance goes down, the PSC and VIP rates should go down. Attempts to characterize the prohibited species bycatch as a fraction of a percent of the target biomass tends to trivialize the issue and deflect attention from the probable effects to the prohibited species biomass. To further compound the adverse impacts of current PSC on crab abundance is the fact that trawling has not been halted because of PSC for crab even though these caps have been greatly exceeded in 1993 and 1994. Totally lacking in a discussion of appropriate PSC for crab is that of the PSC for Opilio Tanner Crab because none exists.

In addition to evaluating appropriate PSC for conservation of crab stocks, it is essential to point out that to date enforcement of PSC at any level for crab stocks has been ineffective in meeting established goals due to problems with observer sampling techniques, lack of 100% observer coverage, and difficulties assimilating raw data for timely management decisions. Our definition of 100% observer coverage is that 100% of all tows need to be sampled to preclude dumping of obviously dirty tows or manipulation of the on board observer's ability to be present for all tows. Also lacking in the enforcement component of the PSC problem is effective prosecution of that portion of the trawl fleet that seems to consistently exceed the VIP rates of the trawl fleet as a whole.

It is in the context of these problems that that the Homer Crab Group is attempting to evaluate existing data and make specific recommendations to the North Pacific Management Council (NPFMC).

## DIRECT IMPACT ON CRAB STOCKS

The direct impact on Red King Crab abundance by bottom trawl fishing practices is virtually undocumented, especially the associated mortalities and habitat destruction on the bottom of the sea.

Though habitat destruction and potential failure of the entire ecosystem is largely not reported in current data, the impact may be inferred from such evidence as the SAFE Report, 9/94 BSAI Plan Team Table 2, pp22-3 which gives the annual totals of Other Flatfish Catch (including Rock Sole) and the NWAFC Processed Report 90-09 & AFSC Processed Report 93-14 which gives the annual abundance estimates for Red King Crab by various size/sex categories. Comparing these reports on a year by year basis it becomes clear that for any given year that Other Flatfish Catch (including Rock Sole) exceeds 50,000 metric tons, the number of small female Red King Crab plummets to clearly unsustainably low levels. The exact mechanism of this decline is not discussed in these reports, but increased predation by disruption of the normal daytime podding behavior and physical damage from the trawl gear all must play a role. Because the observed data is from less than 100% coverage and because the sampling techniques are less than 100% of each tow reported, the reported bycatch must be viewed as essentially the bare minimums with actual losses to the Red King Crab biomass being much greater than reported. The effect of the loss of the useful reproductive life span of the Red King Crab mature females destroyed as bycatch is cumulative. This effect is clearly demonstrated by the "mysterious" decline in abundance of mature female crab from 1993 to 1994.

## NET BENEFIT TO THE NATION

The attached net benefit comparison (Table 13) is compiled using only the direct ex-vessel values for each referenced target and bycatch species from the Rock and Yellowfin Sole trawling operations. On the average of 1992 and 1993, the directed fishing for Rock and Yellowfin Sole constituted a net loss to the nation of \$1,790,000 annually. Table 13 further demonstrates the worth of these directed fisheries using the average discard volumes and current NMFS Standard ex-vessel prices with a net loss to the nation of \$13,920,000. Table 13 shows the net loss of \$91,420,000 to the nation that can be attributed to the Rock and Yellowfin Sole fishery if those fisheries are significantly responsible for the current scarcity of small and mature female Red King Crab and the consequent decision by ADF&G to close the directed Red Crab fishery and truncate the Bairdi Tanner fishery.

The NPFMC, operating under the authority and direction of the Magnuson Act is specifically instructed to manage resources for the net benefit to the nation. The NPFMC has no authority to allow fishing practices that at best are a nominal loss and at worst an unconscionable abuse of public resources.

## **AREA CLOSURES**

The action the NPFMC took to close a sizable additional area of Bristol Bay to all trawling on an emergency basis is a commendable one. However, the likelihood that Red King Crab stocks will immediately rebound as a consequence is very small. The normal reproductive and recruitment cycle for these crabs is nearly seven years so any improvements in stock abundance will be slow in materializing. This indicates that NPFMC must consider a permanent rule change to preserve progress made towards conservation for these stocks.

While considering a permanent rule change the NPFMC must recognize that the area closed is not extensive enough to address the bycatch issues involved if conservation of all PSC species stocks is becoming a priority. The area identified will not contribute significantly to reducing bycatch of Halibut, Bairdi and Opilio Tanner crab, or Pribilof Red and Blue King Crab because the majority of the bycatch of these species occurs in areas other than the area closed. The trawl fishing effort displaced from the area closed will no doubt concentrate in these other areas with increased mortalities to these other prohibited species. The only mechanism the NPFMC has, other than more area closures, to prevent these stocks from joining Red King Crab on the non-exploitable list are careful adjustments and rigorous enforcement of PSC and VIP rates. These other areas of significant bycatch of other PSC species are clearly shown in the ADF&G Draft Discussion Paper, dated November 7, 1994, figures 19-24.

An additional problem with efforts to conserve prohibited species through area closures is that the stocks tend to migrate from area to area during different times of the year. These migrations are not predictable year to year, making an area closure appropriate for a given stock one time and place ineffective at another time and place. This variability dictates that an area closure must be large enough to allow for some degree of stock mobility and lessen the possibility that the inevitable trawl vessel "over the line" incursions will encounter a newly established "hot spot" of stock abundance.

## **OPPOSITION TO INCREASING VIP RATES**

The current proposal by some members of the trawl fleet to use larger size cod end mesh on a voluntary basis is certainly of some merit, but of little immediate consequence in reducing observed crab bycatch mortality. This voluntary commitment by members of a fleet, which on the whole has demonstrated a disregard for existing mandated VIP rates, appears to be more directed at deflecting criticism of target species discards rather than conservation in general. Any reductions in target species discards (a truly desirable goal, which we fully support) will not reduce the cost of PSC species bycatch to others. In addition, the reductions of target bycatch is of no net gain unless the fish passing through the cod end are alive as a viable portion of the future reproductive potential of the target biomass and not merely unobserved. From a conservation standpoint, changing the VIP rates upwards to compensate the whole trawl fleet for some degree of voluntary use of larger mesh by part of the trawl fleet is totally inconsistent with protecting PSC species stocks and defeats the current discussion of what to do about stocks such as Red King Crab.

## **NEED FOR MORE SCIENCE**

It is clear that more science is urgently needed, especially in the areas of habitat destruction, ecosystem relationships, effect of area closures (in terms of reversing declines in specific stock abundance), fishing practices and mortalities, predation rates, and appropriate uses of finite but renewable resources. Time is of the essence, which precludes postponing management decisions until science can catch up. With declining biomasses of all the PSC species, prudence dictates that an extraordinary concern with conservation should be the base from which management decisions are made by the NPFMC.

## **CONCLUSIONS**

The Homer Crab Group urges the NPFMC to adopt the following procedures into a new management regime based on conservation:

- 1) Make the new no trawl zone (The area encompassed by 57 Degrees North and 55 Degrees 45 Minutes North Latitude and 162 to 164 West Longitude) a permanent rule change.
- 2) Observer coverage of all tows employing sampling techniques that will allow successful prosecutions in courts of law for VIP rate abusers.
- 3) Existing PSCs should be directly related to stock abundance and in general need to be reduced to reflect current declines in each stock biomass. Lowering the existing PSCs will shift the "cost of prohibited species bycatch to others" to the trawl fleet to give the trawl fleet a compelling reason to reduce bycatch of prohibited species through modification of fishing practices.
- 4) Establish a PSC for Opilio crab, which is less than the bycatch reported in 1994, consistent with the degree of decline in biomass between 1994 and 1995.
- 5) PSCs need to be absolutely enforced with ZERO TOLERANCE for overages for the trawl fleet in general and individual vessels which exceed VIP rates must be vigorously prosecuted.
- 6) Any overage of PSC should carry forward and be subtracted from the next year's PSC.
- 7) Daily reporting required with adequate database overview to allow timely closures so PSCs are not exceeded.

**NOTES TO TABLES**

**Discard Values**

Calculation of value of Bering Sea/ Aleutian Islands discard values were based on discards from the Yellowfin and Rock Sole trawl fishery only. The discard amounts used in calculating discard value for each species are shown in table 1. It is important to note that the values calculated are only for the species listed and do not represent 100% of the discard values, particularly "Other King Crab" composed largely of Blue King Crab in and around the Pribilof Islands.

**Pollock & Pacific Cod**

Value of Pacific Cod and Pollock discards were calculated assuming the discards of these species could have been made available to other directed fisheries. By multiplying the discarded pounds of each species by the ex-vessel price for each species, the value of the discarded poundage can be estimated. These calculations for 1992 and 1993 discards appear in table 2 and table 3.

**Yellowfin & Rock Sole**

The discarded value of Yellowfin and Rock Sole was estimated using the same method as Pollock and Pacific Cod, with one exception. Yellowfin and Rock Sole are considered under-exploited fish species, so annual fishing mortality estimates were used to calculate the proportion of discards that would have been harvested in other fisheries (Low, 1993). The pounds of discarded fish were multiplied by the annual fishing mortality to estimate the potential harvest pounds lost through discards. Multiplying this potential harvest by the ex-vessel price per pound of each species gives an estimate of the total value of the discarded fish (table 4 and table 5).

**Halibut**

Loss of one pound of Halibut as a discard is equivalent to losing 1.6 pounds of future harvest. In other words IPHC will give increases in harvest equal to 1.6 times the reduction in bycatch (IPHC, 1992). Multiplying the discarded Halibut in 1992 and 1993 by 1.6 estimates the future Halibut harvest lost through discards in these years. Multiplying by the annual ex-vessel prices for Halibut gives an estimate of the value of these discards (table 6).

### Crab Discards

Crab discards in the trawl fisheries for three species; Red King Crab, Bairdi Tanner Crab and Opilio Tanner Crab, were used to calculate value lost through Yellowfin and Rock Sole trawl fishery discards. Contributions for both male and female crab of each species were calculated, males by direct loss of harvestable crab and females by loss of future reproduction. The percentages of male and female crab were obtained from the U.S. observer program (Narita, personal communication) for 1992 and assumed to be constant over 1993 since that information was unavailable. The same source and assumption was used regarding sizes of discarded crab species.

The value of male crab was calculated directly through the poundage lost by discarding male crabs. Since discarded sizes of crab corresponded to ages not yet recruited to fisheries, natural mortality for one year had to be subtracted out. The age of male crab was estimated using available size data, and the fact that crab fisheries are managed to harvest crab at 50% maturity plus one years growth (Donaldson, et al, 1992). Using estimates of size at 50% maturity and estimates of age at 50% maturity (Low, 1993), an approximate age at recruitment to the separate fisheries was calculated. Then by knowing sizes of crab discards the approximate age of discards could be obtained. Using the average pounds of individual crab at harvest, the total poundage and subsequent value of the discarded crab could be calculated.

The value of female crab was calculated by predicting their future male offspring. A ratio of males at fishery recruitment/female was calculated using information from the annual trawl survey of the Bering sea (Stevens, et al., 1993) and an annual exploitation rate. Since the survey results represent crabs surviving all forms of removal between surveys, the ratio used approximates a very conservative rate of recruitment. Multiplying this ratio by the number of female discards gives an approximation of their reproductive contribution to the fishery in future years. Accounting for annual natural mortality in the female population and carrying this method over a number of years should approximate the reproductive contribution (in male fishery recruits) over the female crabs' lifetime.

### Red King Crab (*P. camtschaticus*)

Male King Crab discards were assumed to be age six based on their average carapace length, 120mm (Narita, personal communication). This size corresponds to the average size at 50% maturity and age equal to six years (Low, 1993). Adding one year's growth should give the age at recruitment to the fishery. Subtracting out the natural mortality associated with that year, an estimate of crabs surviving to recruit to the fishery is obtained. Multiplying these surviving crabs by the average size at harvest should give the total poundage available to the directed fishery. Multiplying by the ex-vessel price for the corresponding year gives the total value of the discarded male crab to the directed fishery (table 7).

The female King Crab contribution to the fishery is shown in table 8. The male recruit/female ratio was calculated from 13 years of available data found in table 1 of the annual report to industry on the crab trawl surveys (Stevens, et al, 1993). Pre-recruit king crab from this table are of similar size to age 6 king crab, 120mm (Low, 1993). Using a six year time lag and abundance estimates for each group an average number of pre-recruit males/female was calculated. Subtracting out the proportion (0.26) lost to annual natural mortality (Low, 1993) and adding annual harvest rates the ratio for seven year old (recruited to the fishery) male crab was attained. The ratio of age seven male crab/female was calculated to be 0.11 (table 14). Multiplying the number of discarded females by this ratio (male recruits to the fishery/female) gives an approximation of the female contribution to the fishery seven years into the future. In order to find the female contribution over 10 years, natural mortality for the original females was subtracted annually. This gives an estimate of the number of female discards from the original year that survive each year to reproduce. Using the method outlined above, the contribution in male recruits to the fishery from surviving female crabs can be estimated for subsequent years. The reproductive contribution for the surviving females from the original 1992 and 1993 discards is shown in table 8.

### Tanner Crabs (C. Bairdi)

Male Tanner Crabs discarded in the trawl fisheries had an average size of 104mm in 1992 (Narita, personal communication). This size also corresponds well to the size at 50% maturity of 110mm (Low, 1993) and an age of six. Therefore Tanner crab should recruit to the fishery at age seven. Using the annual natural mortality estimate of 0.26 (Low, 1993), the number of male crab surviving to be harvested was calculated. Using pounds at harvest and ex-vessel prices a total value of discarded male crabs was calculated (table 9).

The female tanner crab contribution to the fishery is shown in table 10. The male recruit to female ratio was calculated from 12 years of available data in the annual report to industry on the crab trawl surveys (Stevens, et al, 1993). The same method was used as in the King Crab calculations, pre-recruits in the table were assumed to be age six based on their sizes and natural mortality was 0.26 (Low, 1993). The ratio of male crab recruits to the fishery/female crab was 0.21 (table 15). The reproductive contribution for surviving females was calculated as in the king crab and is also shown in table 10.

### Snow Crabs (C. Opilio)

Based on their average size, 82mm (Narita, personal communication) male Opilio Crab discards were assumed to be age five. On the average Opilio Crab should recruit to the fishery at age five, age at 50% maturity (four) plus one years growth (Low, 1993), however size limits imposed by processors (Stevens, et al, 1993) mean that at least one more years growth is needed. Therefore Opilio Crab were assumed to recruit to the fishery at age six. So one year of natural mortality was subtracted from the male discards before calculating the total contribution of male Opilio Crab (table 11).

The female Opilio Crab contribution to the fishery is shown in table 12. The male recruit to female ratio was calculated using six years of available data in the annual report to industry on the crab trawl surveys (Stevens, et al, 1993). Based on their size large males were considered to be first year recruits to the fishery, so the male recruits to the fishery/female ratio was calculated directly. The total abundance of large males were divided by the total females for the corresponding six years of spawning. The ratio of male recruits to fishery/female was 0.17 (table 16). The female reproductive contribution to the fishery was calculated for fifteen years using the same method as for King Crab and is shown in table 12.

### Net Benefit to the Nation

The total estimated value of discarded species (in millions of dollars) is shown in table 13. These amounts were the value of discards from the Yellowfin and Rock Sole trawl fisheries only. Totals are broken down by year, and taken directly from tables 2 through 12. The value of the harvested Target Species is from table 17. Table 13 also shows the value of the two year averaged discard volumes using the NMFS 1995 Proposed Standard Ex-vessel Prices from table 18, as well as the addition of the value of the foregone directed harvest of Bristol Bay Red Crab.



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Table 1. Discard values  
Yellowfin and Rock Sole trawl fishery discards

	<u>1992 discards /b</u> (million lbs.)	<u>1993 discards /a</u> (million lbs.)
halibut	3.191	2.358
yellowfin sole	66.246	55.845
rock sole	36.483	60.526
pollock	35.559	68.319
pacific cod	7.397	23.840
	<u>(million crab)</u>	<u>(million crab)</u>
king crab	0.105	0.182
opilio crab	11.914	11.767
bairdi crab	2.174	1.422

a) Pacific Associates, 1994

b) Pacific Associates, 1993

**Table 2. Pacific Cod**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	<u>P. Cod discards</u> <u>/a,b (million lbs.)</u>	<u>harvest</u> <u>(million lbs.)</u>	<u>ex-vessel</u> <u>price /c</u>	<u>discard value</u> <u>(millions)</u>
1992	7.40	7.40	\$0.22	<u><u>\$1.63</u></u>
1993	23.84	23.84	\$0.20	<u><u>\$4.67</u></u>

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a) Pacific Associates, 1994

b) Pacific Associates, 1993

c)PacFIN, 1994

**Table 3. Pollock**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	<u>Pollock discards</u> <u>/a,b (million lbs.)</u>	<u>harvest</u> <u>(million lbs.)</u>	<u>ex-vessel</u> <u>price /c</u>	<u>discard value</u> <u>(millions)</u>
1992	35.6	35.6	\$0.12	<u><u>\$4.41</u></u>
1993	68.3	68.3	\$0.07	<u><u>\$4.78</u></u>

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a) Pacific Associates, 1994

b) Pacific Associates, 1993

c)PacFIN, 1994

**Table 4. Yellowfin Sole**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	<u>Yellowfin Sole discards /a,b (million lbs.)</u>	<u>harvest rate /d</u>	<u>harvest (million lbs.)</u>	<u>ex-vessel price /c</u>	<u>discard value (millions)</u>
1992	66.25	0.06	3.91	\$0.10	<u><u>\$0.40</u></u>
1993	55.85	0.06	3.29	\$0.10	<u><u>\$0.32</u></u>

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a) Pacific Associates, 1994

b) Pacific Associates, 1994

c) PacFIN, 1994

d) Low, 1993

**Table 5. Rock Sole**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	<u>Rock Sole discards /a,b (million lbs.)</u>	<u>harvest rate /d</u>	<u>harvest (million lbs.)</u>	<u>ex-vessel price /c</u>	<u>discard value (millions)</u>
1992	36.48	0.029	1.06	\$0.15	<u><u>\$0.16</u></u>
1993	60.53	0.029	1.76	\$0.11	<u><u>\$0.19</u></u>

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a) Pacific Associates, 1994

b) Pacific Associates, 1994

c) PacFIN, 1994

d) Low, 1993

**Table 6. Halibut**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	<u>Halibut discards</u> <u>/a,b (million lbs.)</u>	<u>future lbs./</u> <u>discard lb. /e</u>	<u>potential</u> <u>harvest</u> <u>(million lbs.)</u>	<u>ex-vessel</u> <u>price/lb. /f</u>	<u>Discard value</u> <u>(millions)</u>
1992	3.19	1.6	5.11	\$0.98	\$5.00
1993	2.36	1.6	3.77	\$1.25	\$4.72

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a) Pacific Associates, 1994

b) Pacific Associates, 1993

e) IPHC, 1993

f) Dinneford, 1994 (personal communication)



**Table 7. Red King Crab  
Male Contribution  
Value of Yellowfin and Rock Sole trawl fishery discards**

	King crab discards (millions) /a,b	% male /g	year	age /d	surviving males (millions)	natural mortality /d	natural died	avg. lbs at harvest /h	harvest lbs (millions)	ex-vessel price /h	harvest value (millions)
1992	0.11	74.60	1	6	0.08	0.26	0.02				
			2	7	0.06			6.7	0.388	\$5.00	<u><u>\$1.94</u></u>
1993	0.18	74.60	1	6	0.14	0.26	0.04				
			2	7	0.10			6.5	0.652	\$3.80	<u><u>\$2.48</u></u>

a) Pacific Associates, 1994

b) Pacific Associates, 1993

d) Low, 1993

g) Narita, 1994 (Personal communication)

h) ADF&G, 1994

Table 8. Red King Crab  
 Female Reproductive Contribution  
 Value of Yellowfin and Rock Sole trawl fishery discards

discard numbers /a,b	% female /g	number of female discards	year	surviving females /d	female/ male recruit /i	males recruited	avg. wt at harvest /h	lbs harvest	ex-vessel price /h	total future value	
1992	105028	25.4	26677	1	26677	0.11	2892	6.7	19373.47	\$5.00	\$96867.35
				2	19741	0.11	2140	6.7	14336.37	\$5.00	\$71681.84
				3	14608	0.11	1583	6.7	10608.91	\$5.00	\$53044.56
				4	10810	0.11	1172	6.7	7850.59	\$5.00	\$39252.97
				5	8000	0.11	867	6.7	5809.44	\$5.00	\$29047.20
				6	5920	0.11	642	6.7	4298.99	\$5.00	\$21494.93
				7	4381	0.11	475	6.7	3181.25	\$5.00	\$15906.25
				8	3242	0.11	351	6.7	2354.12	\$5.00	\$11770.62
				9	2399	0.11	260	6.7	1742.05	\$5.00	\$8710.26
				10	1775	0.11	192	6.7	1289.12	\$5.00	\$6445.59
										<b><u>\$354,221.56</u></b>	
1993	181625	25.4	46133	1	46133	0.11	5000	6.5	32502.48	\$3.80	\$123509.42
				2	34138	0.11	3700	6.5	24051.83	\$3.80	\$91396.97
				3	25262	0.11	2738	6.5	17798.36	\$3.80	\$67633.76
				4	18694	0.11	2026	6.5	13170.78	\$3.80	\$50048.98
				5	13834	0.11	1499	6.5	9746.38	\$3.80	\$37036.25
				6	10237	0.11	1110	6.5	7212.32	\$3.80	\$27406.82
				7	7575	0.11	821	6.5	5337.12	\$3.80	\$20281.05
				8	5606	0.11	608	6.5	3949.47	\$3.80	\$15007.98
				9	4148	0.11	450	6.5	2922.61	\$3.80	\$11105.90
				10	3070	0.11	333	6.5	2162.73	\$3.80	\$8218.37
										<b><u>\$451,645.49</u></b>	

a) Pacific Associates, 1994

g) Narita, 1994 (Personal communication)

b) Pacific Associates, 1993

h) ADF&G, 1994

d) Low, 1993

i) Stevens, et al, 1993

**Table 9. Bairdi Crab  
Male Contribution  
Value of Yellowfin and Rock Sole trawl fishery discards**

	Bairdi discards /a,b (millions)	% male /g	year	age /d	surviving males (millions)	natural mortality /d	natural died	avg. lbs at harvest /h	harvest lbs (millions)	ex-vessel price /h	harvest value (millions)
1992	2.17	74.02	1 2	6 7	1.61 1.19	0.26	0.42	2.5	2.98	\$1.50	<u><u>\$4.47</u></u>
1993	1.42	74.02	1 2	6 7	1.05 0.78	0.26	0.27	2.3	1.79	\$1.69	<u><u>\$3.03</u></u>

a) Pacific Associates, 1994

b) Pacific Associates, 1993

d) Low, 1993

g) Narita, 1994 (Personal communication)

h) ADF&G, 1994

Table 10. Bairdi Crab  
Female Reproductive Contribution

bairdi crab discards /a,b	% female /g	female discards	Value of Yellowfin and Rock Sole trawl fishery discards		discards males recruited	avg wt. at harvest /h	lbs of harvest	ex-vessel price /h	total future value		
			year	surviving females /d						male recruits/ female /i	
1992	2174326	25.98	564890	1	564890	0.21	117946	2.5	294863.88	\$1.50	\$442295.81
				2	418019	0.21	87280	2.5	218199.27	\$1.50	\$327298.90
				3	309334	0.21	64587	2.5	161467.46	\$1.50	\$242201.19
				4	228907	0.21	47794	2.5	119485.92	\$1.50	\$179228.88
				5	169391	0.21	35368	2.5	88419.58	\$1.50	\$132629.37
				6	125349	0.21	26172	2.5	65430.49	\$1.50	\$98145.73
				7	92759	0.21	19367	2.5	48418.56	\$1.50	\$72627.84
				8	68641	0.21	14332	2.5	35829.74	\$1.50	\$53744.60
				9	50795	0.21	10606	2.5	26514.00	\$1.50	\$39771.01
				10	37588	0.21	7848	2.5	19620.36	\$1.50	\$29430.55
				11	27815	0.21	5808	2.5	14519.07	\$1.50	\$21778.60
				12	20583	0.21	4298	2.5	10744.11	\$1.50	\$16116.17
				13	15232	0.21	3180	2.5	7950.64	\$1.50	\$11925.96
				14	11271	0.21	2353	2.5	5883.48	\$1.50	\$8825.21
				15	8341	0.21	1742	2.5	4353.77	\$1.50	\$6530.66
										<u>\$1,682,550.49</u>	
1993	1421832	25.98	369392	1	369392	0.21	77127	2.3	177391.59	\$1.69	\$299791.79
				2	273350	0.21	57074	2.3	131269.78	\$1.69	\$221845.92
				3	202279	0.21	42235	2.3	97139.63	\$1.69	\$164165.98
				4	149686	0.21	31254	2.3	71883.33	\$1.69	\$121482.83
				5	110768	0.21	23128	2.3	53193.66	\$1.69	\$89897.29
				6	81968	0.21	17114	2.3	39363.31	\$1.69	\$66524.00
				7	60657	0.21	12665	2.3	29128.85	\$1.69	\$49227.76
				8	44886	0.21	9372	2.3	21555.35	\$1.69	\$36428.54
				9	33216	0.21	6935	2.3	15950.96	\$1.69	\$26957.12
				10	24579	0.21	5132	2.3	11803.71	\$1.69	\$19948.27
				11	18189	0.21	3798	2.3	8734.74	\$1.69	\$14761.72
				12	13460	0.21	2810	2.3	6463.71	\$1.69	\$10923.67
				13	9960	0.21	2080	2.3	4783.15	\$1.69	\$8083.52
				14	7371	0.21	1539	2.3	3539.53	\$1.69	\$5981.80
				15	5454	0.21	1139	2.3	2619.25	\$1.69	\$4426.53
										<u>\$1,140,446.73</u>	

a) Pacific Associates, 1994

g) Narita, 1994 (Personal communication)

b) Pacific Associates, 1993

h) ADF&G, 1994

d) Low, 1993

i) Stevens, et al, 1993

Table 11. **Opilio Crab**  
**Male Contribution**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	Opilio discards /a,b (millions)	%male /g	year	age /d	surviving males (millions)	natural mortality /d	natural died	avg. lbs at harvest /h	harvest lbs. (millions)	ex-vessel price /h	Harvest value (millions)
1992	11.91	69.72	1	5	8.31	0.26	2.16	1.4	8.61	\$0.50	<u><u>\$4.30</u></u>
			2	6	6.15						
1993	11.77	69.72	1	5	8.20	0.26	2.13	1.4	8.50	\$0.75	<u><u>\$6.37</u></u>
			2	6	6.07						

a) Pacific Associates, 1994

b) Pacific Associates, 1993

d) Low, 1993

g) Narita, 1994 (Personal communication)

h) ADF&G, 1994

**Table 12. Opilio Crab**  
**Female Reproductive Contribution**  
**Value of Yellowfin and Rock Sole trawl fishery discards**

	Opilio discards /a.b	%female /g	number of female discards	year	surviving females /d	male recruits/ female /i	males recruited	avg. wt at harvest /h	lbs of harvest	ex-vessel price /h	total future value
1992	11913759	30.28	3607486.225	1	3607486	0.17	597129	1.4	835980.30	\$0.50	\$417990.15
				2	2669540	0.17	441875	1.4	618625.42	\$0.50	\$309312.71
				3	1975459	0.17	326988	1.4	457782.81	\$0.50	\$228891.41
				4	1461840	0.17	241971	1.4	338759.28	\$0.50	\$169379.64
				5	1081762	0.17	179058	1.4	250881.87	\$0.50	\$125340.93
				6	800504	0.17	132503	1.4	185504.58	\$0.50	\$92752.29
				7	592373	0.17	98052	1.4	137273.39	\$0.50	\$68636.70
				8	438356	0.17	72559	1.4	101582.31	\$0.50	\$50791.15
				9	324383	0.17	53694	1.4	75170.91	\$0.50	\$37585.45
				10	240044	0.17	39733	1.4	55826.47	\$0.50	\$27813.24
				11	177632	0.17	29403	1.4	41163.59	\$0.50	\$20581.79
				12	131448	0.17	21758	1.4	30461.06	\$0.50	\$15230.53
				13	97271	0.17	16101	1.4	22541.18	\$0.50	\$11270.59
				14	71981	0.17	11915	1.4	16680.47	\$0.50	\$8340.24
				15	53266	0.17	8817	1.4	12343.55	\$0.50	\$6171.78
											<b><u>\$1,590,088.60</u></b>
1993	11766552	30.28	3562911.946	1	3562912	0.17	588682	1.4	824154.46	\$0.75	\$618115.85
				2	2636555	0.17	435625	1.4	609874.30	\$0.75	\$457405.73
				3	1951051	0.17	322362	1.4	451306.98	\$0.75	\$338480.24
				4	1443777	0.17	238548	1.4	333967.17	\$0.75	\$250475.38
				5	1068395	0.17	176526	1.4	247135.70	\$0.75	\$185351.78
				6	790613	0.17	130629	1.4	182880.42	\$0.75	\$137160.32
				7	585053	0.17	96665	1.4	135331.51	\$0.75	\$101498.63
				8	432939	0.17	71532	1.4	100145.32	\$0.75	\$75108.99
				9	320375	0.17	52934	1.4	74107.54	\$0.75	\$55580.65
				10	237078	0.17	39171	1.4	54839.58	\$0.75	\$41129.68
				11	175437	0.17	28987	1.4	40581.29	\$0.75	\$30435.96
				12	129824	0.17	21450	1.4	30030.15	\$0.75	\$22522.61
				13	96070	0.17	15873	1.4	22222.31	\$0.75	\$16666.73
				14	71091	0.17	11746	1.4	16444.51	\$0.75	\$12333.38
				15	52608	0.17	8692	1.4	12168.94	\$0.75	\$9126.70
											<b><u>\$2,351,392.64</u></b>

a) Pacific Associates, 1994

g) Narita, 1994 (Personal communication)

b) Pacific Associates, 1993

h) ADF&G, 1994

d) Low, 1993

i) Stevens, et al, 1993

Table 13. Net Benefit Calculations  
Yellowfin and Rock sole trawl fishery discards

	1992 Estimated value (millions) /n	1993 Estimated value (millions) /n	1992-93 Average estimated value using 1995 standard ex-vessel prices (millions) /o	1992-93 Average estimated value, 1995 standard ex- vessel prices, foregone red king crab season (millions) / p, q
Retained Harvest	\$28.76		\$24.13	\$25.82
1994 Foregone Red King Crab Harvest				(\$55.00)
1994 Truncated Bairdi Harvest				(\$22.50)
<b>Discards:</b>				
Halibut	(\$5.00)	(\$4.72)	(\$5.83)	(\$5.83)
Pacific Cod	(\$1.63)	(\$4.67)	(\$2.00)	(\$2.00)
Pollock	(\$4.41)	(\$4.78)	(\$4.41)	(\$4.41)
Yellowfin Sole	(\$0.40)	(\$0.32)	(\$0.22)	(\$0.22)
Rock Sole	(\$0.16)	(\$0.19)	(\$0.42)	(\$0.42)
King Crab	(\$2.30)	(\$2.93)	(\$2.60)	(\$2.60)
Bairdi	(\$6.15)	(\$4.17)	(\$7.16)	(\$7.16)
Opilio	(\$5.89)	(\$8.73)	(\$17.10)	(\$17.10)
Blue King Crab	—	—	—	—
Estimated Discard Value	<u>(\$25.95)</u>		<u>(\$30.51)</u>	<u>(\$39.73)</u>
Net benefit to the Nation	<u>\$2.81</u>		<u>(\$6.38)</u>	<u>(\$91.42)</u>

n) Tables 1 through 6 and 17 of this report.

o) Average value of 1992 and 1993 harvest and above listed discards using NMFS proposed 1995 Standard Ex-vessel Prices.

p) Same as o) above with the addition of the value of the foregone 1994 Bristol Bay Red King Crab directed pot fishery, 11.0 million pounds @ \$5.00.

q) Same as o) above with the addition of the foregone Bairdi harvest East of 163 degrees West, 7.5 million pounds @ \$3.00.

Table 14. Red King Crab  
Male recruit/female calculation

total females (millions) /i	total male crab (average age 6) (millions) /i
129.7	18.4
107.7	17.4
183.6	10.4
166.6	12.6
156	10.1
112.5	12.3
103.6	12.6
132	6.4
34	9.4
75.1	10.2
13.7	6.4
9.8	5.5
35.1	10.2
1259.4	141.9

Survey age 6 crab	Annual directed harvest	Total annual recruits	natmort	surviving age 7 crab	male recruit/female ratio
141.9	42.57	184.47	0.26	136.5078	0.108391139

calculated ratio of male recruits to fishery/female for red king crab

i)Stevens, et al, 1993

j)Average exploitation rate???



Table 15. Bairdi Crab  
Male recruit/female calculation

Total females (millions) /i	total male crabs (average age 6) (millions) /i
395.1	46.9
544.2	32
189.4	21.2
164.7	9.4
433.7	12.9
403.3	19.7
210	59.7
225.5	102.1
140.4	78.8
39.8	105.4
81.9	101.9
228.8	63.4
<b>3056.8</b>	<b>653.4</b>

Survey age 6 crab	Annual directed harvest /j	Total annual recruits	natural mortality	Surviving age 7 crab	Legal male recruits/female ratio
653.4	209.088	862.488	0.26	638.2411	0.208793876

calculated ratio male recruits to fishery/female

i) Stevens, et al, 1993

j) Average exploitation rate???

Table 16. Opilio Crab  
Male recruit/female calculation

females (millions) /i	large males, age 6 (millions) /i
2658	171
1913	187
1192	420
382	484
1212	256
5849	135
13206	1653

Survey age 6 crab	Annual directed harvest /j	Total annual recruits	male recruits/female ratio
1653	528.96	2181.96	0.165224898

calculated ratio of male recruits/females for opilio

---

i) Stevens, et al, 1993

**Table 17. Target Harvest Values  
Yellowfin and Rock sole trawl fishery**

	<u>1992</u> <u>(millions lbs.) /a,b</u>	<u>Ex-vessel value</u> <u>/c</u>	<u>Harvest Value</u> <u>(millions)</u>
Yellowfin Sole	221.0	\$0.10	\$22.10
Rock Sole	44.4	\$0.15	\$6.66
			<u>\$28.76</u>
	<u>1993</u> <u>(millions lbs.) /a,b</u>	<u>Ex-vessel value</u> <u>/c</u>	<u>Harvest Value</u> <u>(millions)</u>
Yellowfin Sole	177.5	\$0.10	\$17.75
Rock Sole	58	\$0.11	\$6.38
			<u>\$24.13</u>

---

a) Pacific Associates, 1993

b) Pacific Associates, 1993

c) PacFIN, 1994

**Table 18. Average Discards, Standard Prices  
Yellowfin and Rock sole trawl fishery discards**

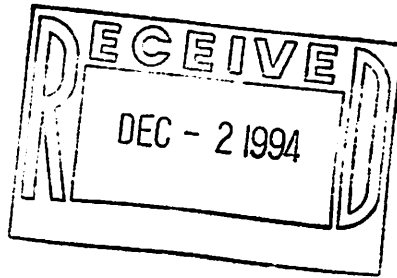
**1992-93 Average Target Value  
Based on 1995 Standard Ex-vessel prices**

	<u>Average lbs. (millions)</u>	<u>Standard Price</u>	<u>Discard Value (millions)</u>
Yellowfin sole	199.25	0.06	11.955
Rock Sole	46.2	0.30	13.86
			<u><u>\$25.82</u></u>

**1992-93 Average Bycatch Value  
Based upon 1995 Standard Ex-vessel prices**

	<u>Average lbs. (millions)</u>	<u>Standard Price</u>	<u>Discard Value (millions) /k</u>
Halibut	2.7745	2.10	(\$5.83)
yellowfin sole	3.6	0.06	(\$0.22)
rock sole	1.41	0.30	(\$0.42)
pollock	51.939	0.09	(\$4.41)
pacific cod	15.6185	0.13	(\$2.00)
king crab	0.52	5.00	(\$2.60)
opilio crab	8.55	2.00	(\$17.10)
bairdi crab	2.385	3.00	(\$7.16)
blue King Crab			
			<u><u>(\$39.73)</u></u>

k) NMFS Proposed 1995 Standard Ex-vessel Prices, October 31, 1994, table 2.



Dec. 2, 1994

Dear Mr. Lauber,

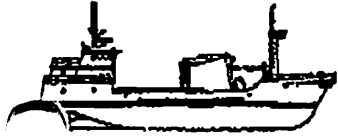
My name is Ron Frels and I am the owner/operator of the 97' crabber/tender, High Spirit. Since my recent fax to your office, two developments I was unaware of have come to my attention. One of them being the emergency regulation passed by the Council last month restricting trawling on critical crab grounds in the Bering Sea/Aleutian waters, which I strongly support. It stretches my imagination to its outer limits trying to understand why it could be allowed for a fishery (Trawl) to have a by-catch, any by-catch at all, of a species that is in such bad shape (King Crab), that we are not even allowed a direct season for them. The whole issue is so self explanatory, I fail to see where the trawlers as group have any justification whatsoever wanting to be able to fish on the traditional King and Tanner crab grounds.

The second development I spoke of is an opening on the N.P.M.C. Advisory Panel. I feel the panel would benefit greatly by the experience and insight of Jeff Stephen. I have been fishing in the Kodiak and Bering Sea waters since 1973 and in that time, the Marketing Assoc. in Kodiak has had several directors. In my opinion, Jeff Stephen has a better grasp of the overall mechanics of the current fishing, marketing, and regulatory needs than his predecessors and therefor would be a valuable asset to the Advisory Panel.

Thank you again for your time.

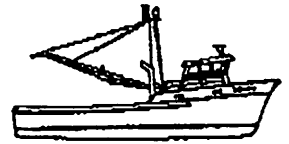
Sincerely,

Ronald A. Frels  
Owner-Operator F/V High Spirit



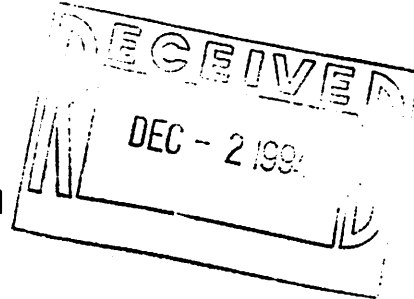
F / V LADY ALASKA  
F / V LADY KODIAK  
F / V LADY ALEUTIAN

**KEVIN SUYDAM**  
F / V LADY KODIAK - F / V LADY ALASKA  
F / V LADY ALEUTIAN - F / V WENONA  
P.O. Box 980 • Kodiak, Alaska 99615  
(907) 486-5396



F / V WENONA

Mr Rick Lauber  
North Pacific Fisheries Management Council  
PO Box 103136  
Anchorage, Alaska 99510



Dec. 1, 1994

Dear Mr. Lauber:

We are in strong support of the Emergency Regulations approved by the North Pacific Fisheries Management Council on 11/14/94 to protect critical areas of the Bering Sea/Aleutians Crab Stocks from bycatch by Trawlers. To allow Trawling to continue to waste with any bycatch of a valuable fishery such as these crab species is beyond belief. To allow the continuation of this wasteful practice of crab bycatch when our directed King Crab fishery was closed this year would be doubly beyond belief.

It is encouraging to see the Council act on some true Management biological issues affecting our fisheries instead of the Economics and Business aspects of our fisheries for which there are ongoing deliberations over. Thank you.

Sincerely,

*Kevin Suydam*  
Kevin Suydam

## ALASKA BOARD OF FISHERIES

Resolution Title: Reducing Bycatch and Waste in the North Pacific and Bering Sea Fisheries.

**WHEREAS**, in 1992 and 1993, the North Pacific fishermen discarded as dead or dying more fish than U.S. Atlantic coast fishermen harvested in those years; and

**WHEREAS**, of the total groundfish catch of the Bering Sea/Aleutian Islands and Gulf of Alaska in 1993 which amounted to at least 4.6 billion pounds, discards amounted to at least 740 million pounds, or 16% of the total catch; and

**WHEREAS**, this bycatch in 1993 included over 370,000 salmon bound for river systems in the State of Alaska, over 16 and a half MILLION crab, 16 MILLION pounds of halibut, and over 750,000 pounds of herring; and

**WHEREAS**, the rippling effects of this appalling waste of our natural resources threatens the economic and cultural well-being of many Alaskan rural communities, and

**WHEREAS**, the minimization of bycatch waste in the fisheries of the Bering Sea and Gulf of Alaska is a prudent measure to provide the conservation of marine resources for future generations of subsistence, commercial, and sport fishers and hunters of marine life; and

**WHEREAS**, a system of economic incentives can be a viable solution to reduce the wanton bycatch and waste in the North Pacific; now

**BE IT RESOLVED**, that the Alaska Board of Fisheries has as a primary goal to greatly reduce this bycatch and waste; and

**BE IT FURTHER RESOLVED**, that minimizing bycatch must be first and foremost in any waste reduction plan. The Board of Fisheries strongly urges the North Pacific Fishery Management Council and Congress to promote measures to minimize bycatch and waste through harvest priority incentives for clean fishing practices.

Adopted: November 14, 1994

Vote: (7/0) (Yes/No)

Location: Anchorage, AK

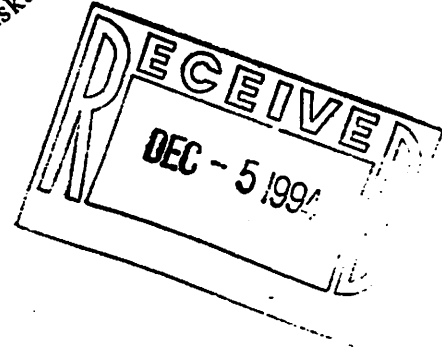
  
Larry Engel, Chair  
Alaska Board of Fisheries



Brent C. Paine  
Executive Director

Steve Hughes  
Technical Director

November 29, 1994



Mr. Steven Pennoyer, Regional Director  
Alaska Region, NOAA/NMFS  
P.O. Box 21668  
Juneau, Alaska 99802-1668

Re: Emergency Closure to Reportedly Protect Bristol Bay Red King Crab  
from the Bering Sea Rocksole Fishery

Dear Steve:

On behalf of the 52 member vessels in United Catcher Boats, most of which deliver their catches to Western Alaska shoreplants UniSea, Aleyska, Westward and Trident, as well as the at-sea motherships F/V *Ocean Phoenix*, *Excellence*, and *Golden Alaska* which our members also provide with groundfish catches, we object in the strongest of terms to the NPFMCs November 14, 1994, action to close the Bering Sea to all trawling by Emergency Rule between 162°-164°W longitude and 55°45'-57°00'N latitude.

This action, taken by a teleconference vote of "six for and five against", is clearly not only a red king crab conservation action, and has far reaching adverse consequences which directly jeopardize the catcher vessels achieving of optimum yield in their pollock, Pacific cod and yellowfin sole fisheries. This action will close important fishing grounds which are clearly south and west of significant red king crab habitat. The proof is readily at-hand in observer data, as well as in the results of the annual Bering Sea crab/groundfish trawl survey which serves as the basis for both Bering Sea crab and groundfish management.

We offer the following facts:

1. The Council action closed grounds to trawling which were not even considered in the alternatives, in particular the area west of Block 9.\*

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\* ADF&G draft discussion paper November 7, 1994, Figure 25.



2. The public was not advised that closure of the area west of Block 9 was even a possibility and this area is of substantial importance to our cod and pollock vessels--particularly since closure of the sea lion rookery areas.
3. For 1994, the entire Pacific cod trawl fishery harvested over 92,000 mt of cod. The total red king crab bycatch in the cod fishery was reported by NMFS as being 1,254 crab. That is about .014 crab per mt of groundfish or about 1.4 crab per 100 tons of groundfish.
4. In 1993, the picture was nearly identical--the entire Bering Sea cod trawl fishery caught over 94,000 mt of cod and 1,235 red king crab. The red king crab bycatch rate for the 1993 cod trawl fishery equals .013 crab per mt of groundfish or about 1.3 crab per 100 tons of groundfish.
5. In the Bering Sea/Aleutians, the entire 1994 bottom trawl pollock fishery harvested 138,748 mt of groundfish with a bycatch of 42,511 red king crab--0.3 crab per ton of groundfish. We don't have a breakdown of the red king crab bycatch between catcher vessels and factory trawlers but we note that 41,535 of the 42,511 crab (98%) were taken during the January 20-February 19 period and that only 2% were taken thereafter. Only 146 red king crab were taken in the "B" season bottom trawl fishery for pollock, incidental to more than 84,000 mt of groundfish--a rate of .0017 red king crab per ton of groundfish. We ask that only the catcher boat portion of the bottom trawl pollock fishery be analyzed to determine its red king crab bycatch.
6. We have several fishermen who have been harvesting YFS between 162°-164° and 56°30'-57°00'N (Block 1, 2, 3 and 4)\* with reportedly very low red king crab bycatches. Their deliveries have been to shore plants and come from a region close enough to shore plants to make such deliveries feasible. This region reportedly accounts for only 1% of the rocksole catch--why is this area being closed? Has anyone analyzed the impacts on the shoreside yellowfin sole fishery, or on other fisheries?
7. The high red king crab bycatch rates clearly exists in the rocksole fishery--not in cod and not in bottom trawl pollock. The high rates of red king crab bycatch clearly occur north of 56°10' and south of 56°30' between 162° and 164°W. Red king crab conservation should be addressed in this area.
8. Virtually no red king crab are taken by midwater trawling. With observer coverage as extensive as it is, there is no conservation or economic justification for closing this area to midwater trawling.

9. Any area closed to the rocksole fishery should be opened to other trawl fisheries after the rocksole fishery is closed. There is absolutely no reason to close this ground to fisheries who have demonstrated they don't contribute to the red king crab conservation problem.

We ask that the NPFMCs November 14, 1994, actions be modified to protect red king crab per the industry agreed position, without jeopardizing the non rocksole trawl fisheries. The fishery specific area which should be closed is obvious to any objective analysis.

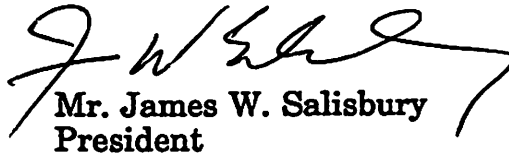
Sincerely,

UNITED CATCHER BOATS



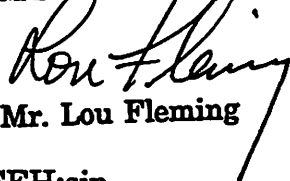
Steven E. Hughes  
Technical Advisor

Supreme Alaska Seafoods, Inc.  
M/S Excellence




Mr. James W. Salisbury  
President

Golden Alaska Seafoods, Inc.  
M/S Golden Alaska



Mr. Lou Fleming

Premier Pacific Seafoods, Inc.  
M/S Ocean Phoenix



Mr. Dave Galloway

SEH:sjp  
Attachments

cc: Mr. Richard Lauber, Chairman NPFMC  
✓ Mr. Clarence G. Pautzke, Executive Director NPFMC (for  
distribution)  
Mr. Carl Rosier, State of Alaska  
Mr. Earl Krygier and David Benton, State of Alaska  
Mr. Vince Curry, PSPA  
Mr. Arni Thomson, ACC  
Mr. R. Barry Fisher, MTC  
Mr. David Fluharty  
Mr. Walter Pereyra  
Mr. Alan Millikan  
Mr. Robert Mace

1994 Bairdi tanner and red king crab bycatch by target fishery and week  
 in the Bering Sea and Aleutian Islands

Trawl Gear

KEY	Groundfish		Bairdi		Bairdi per mt	Red King		Red King per mt
	Tons		Bycatch			Bycatch		
A 01/22/94	733.19		0		0.00	0	0.00	
A 01/29/94	4,298.03		0		0.00	0	0.00	
A 02/05/94	3,841.14		0		0.00	0	0.00	
A 02/12/94	6,897.50		0		0.00	0	0.00	
A 02/19/94	2,349.70		0		0.00	0	0.00	
A 02/26/94	2,622.92		0		0.00	0	0.00	
A 03/05/94	401.60		0		0.00	0	0.00	
A 03/12/94	3,271.76		0		0.00	0	0.00	
A 03/19/94	2,729.33		0		0.00	0	0.00	
A 03/26/94	3,461.25		0		0.00	0	0.00	
A 04/02/94	2,529.33		0		0.00	0	0.00	
A 04/09/94	3,969.54		0		0.00	0	0.00	
A 04/16/94	3,866.73		0		0.00	0	0.00	
A 04/23/94	3,497.70		0		0.00	0	0.00	
A 04/30/94	3,154.17		0		0.00	0	0.00	
A 05/07/94	1,222.94		0		0.00	0	0.00	
A 05/14/94	3,747.43		0		0.00	0	0.00	
A 05/21/94	4,184.30		0		0.00	0	0.00	
A 05/28/94	5,227.88		0		0.00	0	0.00	
A 06/04/94	2,254.01		0		0.00	0	0.00	
A 06/11/94	2,502.12		0		0.00	0	0.00	
A 06/18/94	1,272.24		0		0.00	0	0.00	
A 06/25/94	2,179.09		0		0.00	0	0.00	
A 07/02/94	1,349.87		0		0.00	0	0.00	
A 07/09/94	1,068.67		0		0.00	0	0.00	
A 07/16/94	1,865.89		0		0.00	0	0.00	
A 07/23/94	3,947.39		0		0.00	0	0.00	
A 07/30/94	4,014.65		0		0.00	0	0.00	
B 01/22/94	2,692.97	18,407	0	6.84	15,466	5.74		
B 01/29/94	4,355.39	8,994	0	2.07	5,844	1.34		
B 02/05/94	13,076.12	26,242	0	2.01	3,296	0.25		
B 02/12/94	9,483.77	6,506	0	0.69	10,408	1.10		
B 02/19/94	11,264.42	12,267	0	1.09	6,521	0.58		
B 02/26/94	2,398.10	454	0	0.19	38	0.02		
B 03/05/94	3,601.21	864	0	0.24	26	0.01		
B 03/12/94	5,316.49	4,897	0	0.92	321	0.06		
B 03/19/94	763.32	97	0	0.13	0	0.00		
B 03/26/94	752.51	13	0	0.02	0	0.00		
B 04/02/94	191.65	0	0	0.00	0	0.00		
B 04/09/94	217.44	72	0	0.33	0	0.00		
B 04/16/94	1.69	0	0	0.00	0	0.00		
B 04/23/94	56.41	0	0	0.00	0	0.00		
B 05/14/94	68.46	445	0	6.50	445	6.50		
B 08/13/94	395.47	197	0	0.50	0	0.00		
B 08/20/94	15,075.32	39,806	0	2.64	142	0.01		
B 08/27/94	19,734.51	40,174	0	2.04	4	0.00		
B 09/03/94	18,555.56	32,041	0	1.73	0	0.00		
B 09/10/94	18,607.59	29,399	0	1.58	0	0.00		

Bottom Trawl Pollock

continued...

BSAI

Trawl Gear

KEY	Groundfish Tons	Bairdi Bycatch	Bairdi per mt	Red King Bycatch	Red King per mt
B 09/17/94	2,963.51	168	0.06	0	0.00
B 09/24/94	8,762.39	130	0.01	0	0.00
B 10/01/94	1,042.04	333	0.32	0	0.00
				<u>4251</u>	
C 01/22/94	17.56	377	21.45	0	0.00
C 01/29/94	1,124.18	93,061	82.78	60	0.05
C 02/05/94	1,051.35	4,803	4.57	17	0.02
C 02/12/94	757.03	2,353	3.11	10	0.01
C 02/19/94	2,596.63	476	0.18	0	0.00
C 02/26/94	1,509.63	639	0.42	0	0.00
C 03/05/94	4,934.25	7,987	1.62	440	0.09
C 03/12/94	12,893.43	8,282	0.64	0	0.00
C 03/19/94	14,827.56	10,975	0.74	32	0.00
C 03/26/94	10,463.03	8,416	0.80	0	0.00
C 04/02/94	8,494.28	10,566	1.24	0	0.00
C 04/09/94	8,278.65	11,707	1.41	0	0.00
C 04/16/94	7,366.22	7,832	1.06	1	0.00
C 04/23/94	6,535.46	9,453	1.45	0	0.00
C 04/30/94	6,801.72	13,886	2.04	0	0.00
C 05/07/94	3,532.61	5,971	1.69	216	0.06
C 05/14/94	659.74	554	0.84	478	0.73
C 05/21/94	4.55	0	0.00	0	0.00
C 06/04/94	32.50	47	1.45	0	0.00
C 06/11/94	9.47	534	56.34	0	0.00
C 07/09/94	8.09	36	4.39	0	0.02
C 08/06/94	1,334.43	41,768	31.30	0	0.00
C 08/20/94	229.46	0	0.00	0	0.00
C 08/27/94	633.00	4,393	6.94	0	0.00
C 09/17/94	1,646.16	4,379	2.66	0	0.00
C 10/01/94	135.29	0	0.00	0	0.00
C 10/15/94	870.73	2,220	2.55	0	0.00
				<u>1254</u>	
F 03/12/94	1,274.95	23,545	18.47	0	0.00
F 03/19/94	1,285.47	612	0.48	0	0.00
F 03/26/94	487.38	4,309	8.84	0	0.00
F 04/02/94	852.60	2,962	3.47	0	0.00
F 04/09/94	2,649.39	5,537	2.09	0	0.00
F 04/16/94	909.58	222	0.24	0	0.00
F 04/23/94	1,179.64	16,094	13.64	0	0.00
F 04/30/94	413.38	585	1.41	0	0.00
F 05/21/94	521.37	245	0.47	0	0.00
F 05/28/94	292.74	629	2.15	0	0.00
F 06/04/94	589.38	680	1.15	0	0.00
F 06/11/94	313.41	194	0.62	0	0.00
F 06/18/94	72.48	0	0.00	0	0.00
F 07/02/94	70.76	0	0.00	0	0.00
F 08/06/94	1,960.23	11,899	6.07	0	0.00
F 08/13/94	6,308.35	51,144	8.11	0	0.00
F 08/20/94	1,771.17	3,691	2.08	0	0.00
F 08/27/94	7.20	0	0.00	0	0.00

Pacific cod Trawl

1993 Bairdi tanner and red king crab bycatch by target fishery and week  
in the Bering Sea and Aleutian Islands

Trawl Gear

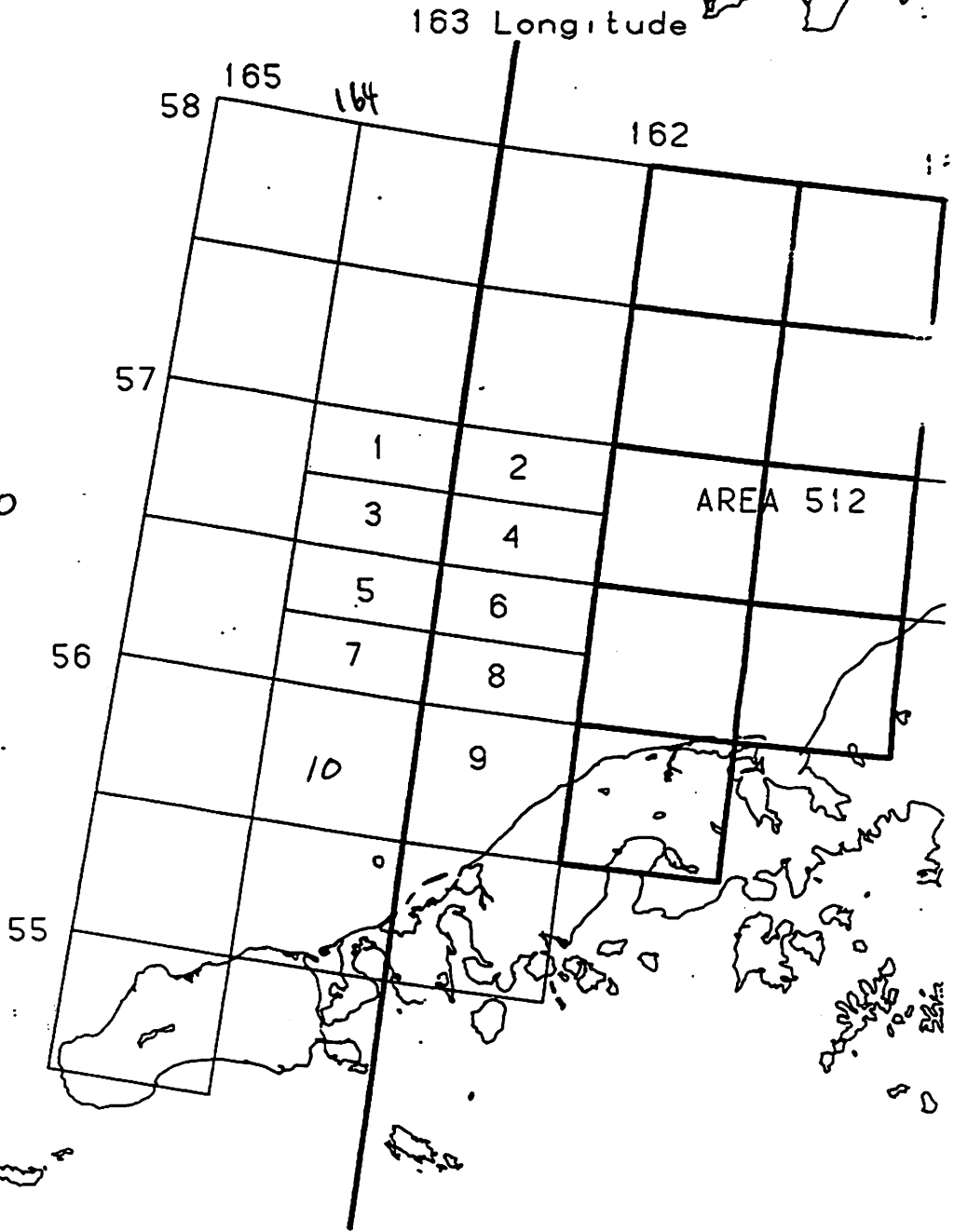
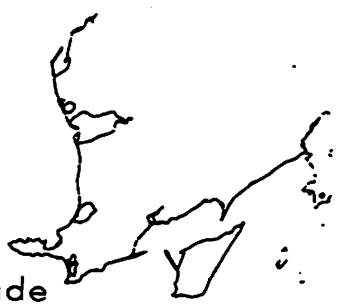
KEY	Groundfish Tons	Bairdi Bycatch	Bairdi per mt	Red King Bycatch	Red King per mt
A 01/23/93	1,013.5	0.0	0.00	0.0	0.00
A 01/30/93	2,616.6	0.0	0.00	0.0	0.00
A 02/06/93	2,378.7	0.0	0.00	0.0	0.00
A 02/13/93	2,650.5	0.0	0.00	0.0	0.00
A 02/20/93	2,946.9	0.0	0.00	0.0	0.00
A 02/27/93	6,332.2	0.0	0.00	0.0	0.00
A 03/06/93	9,303.7	2.7	0.00	0.0	0.00
A 03/13/93	6,729.4	115.5	0.02	0.0	0.00
B 01/23/93	1,811.6	7,348.9	4.06	5,620.8	3.10
B 01/30/93	4,722.1	17,517.9	3.71	3,171.6	0.67
B 02/06/93	10,526.2	51,345.3	4.88	6,816.3	0.65
B 02/13/93	13,224.1	124,440.6	9.41	9,584.6	0.72
B 02/20/93	21,944.3	361,698.5	16.48	4,470.9	0.20
B 02/27/93	5,924.3	162,201.1	27.38	265.7	0.04
B 03/06/93	9,883.5	329,152.8	33.30	0.0	0.00
B 03/13/93	7,023.6	17,246.5	2.46	0.0	0.00
B 03/20/93	3,501.6	27,455.0	7.84	989.5	0.28
B 03/27/93	8,746.1	94,145.6	10.76	5,856.7	0.67
B 04/03/93	497.6	223.6	0.45	0.0	0.00
B 05/01/93	114.5	1,298.7	11.34	85.9	0.75
B 05/08/93	36.4	0.0	0.00	0.0	0.00
B 07/10/93	420.1	4,763.8	11.34	315.1	0.75
B 08/21/93	3,836.0	20,273.6	5.29	51.4	0.01
B 08/28/93	2,667.0	229.1	0.09	0.0	0.00
B 09/04/93	407.4	4,620.0	11.34	305.6	0.75
B 09/11/93	735.2	0.0	0.00	0.0	0.00
C 01/23/93	798.3	4,962.8	6.22	18.4	0.02
C 01/30/93	1,110.4	2,587.1	2.33	0.0	0.00
C 02/06/93	3,071.3	3,924.5	1.28	7.3	0.00
C 02/13/93	4,458.2	3,209.9	0.72	0.0	0.00
C 02/20/93	1,301.3	3,652.0	2.81	0.0	0.00
C 02/27/93	2,770.0	2,651.7	0.96	45.9	0.02
C 03/06/93	3,902.3	3,054.1	0.78	0.4	0.00
C 03/13/93	5,489.2	4,786.5	0.87	17.0	0.00
C 03/20/93	9,398.3	17,175.8	1.83	655.9	0.07
C 03/27/93	9,196.0	14,353.9	1.56	21.6	0.00
C 04/03/93	13,568.5	21,606.3	1.59	109.8	0.01
C 04/10/93	13,547.3	14,228.2	1.05	152.9	0.01
C 04/17/93	10,373.5	14,826.8	1.43	162.9	0.02
C 04/24/93	13,153.2	8,331.5	0.63	43.0	0.00
C 05/01/93	6,873.4	2,869.0	0.42	0.0	0.00
C 05/08/93	2.0	432.4	220.59	0.0	0.00
C 06/26/93	57.7	0.0	0.00	0.0	0.00
C 07/10/93	2.3	0.0	0.00	0.0	0.00

PACIFIC COD TRAWL

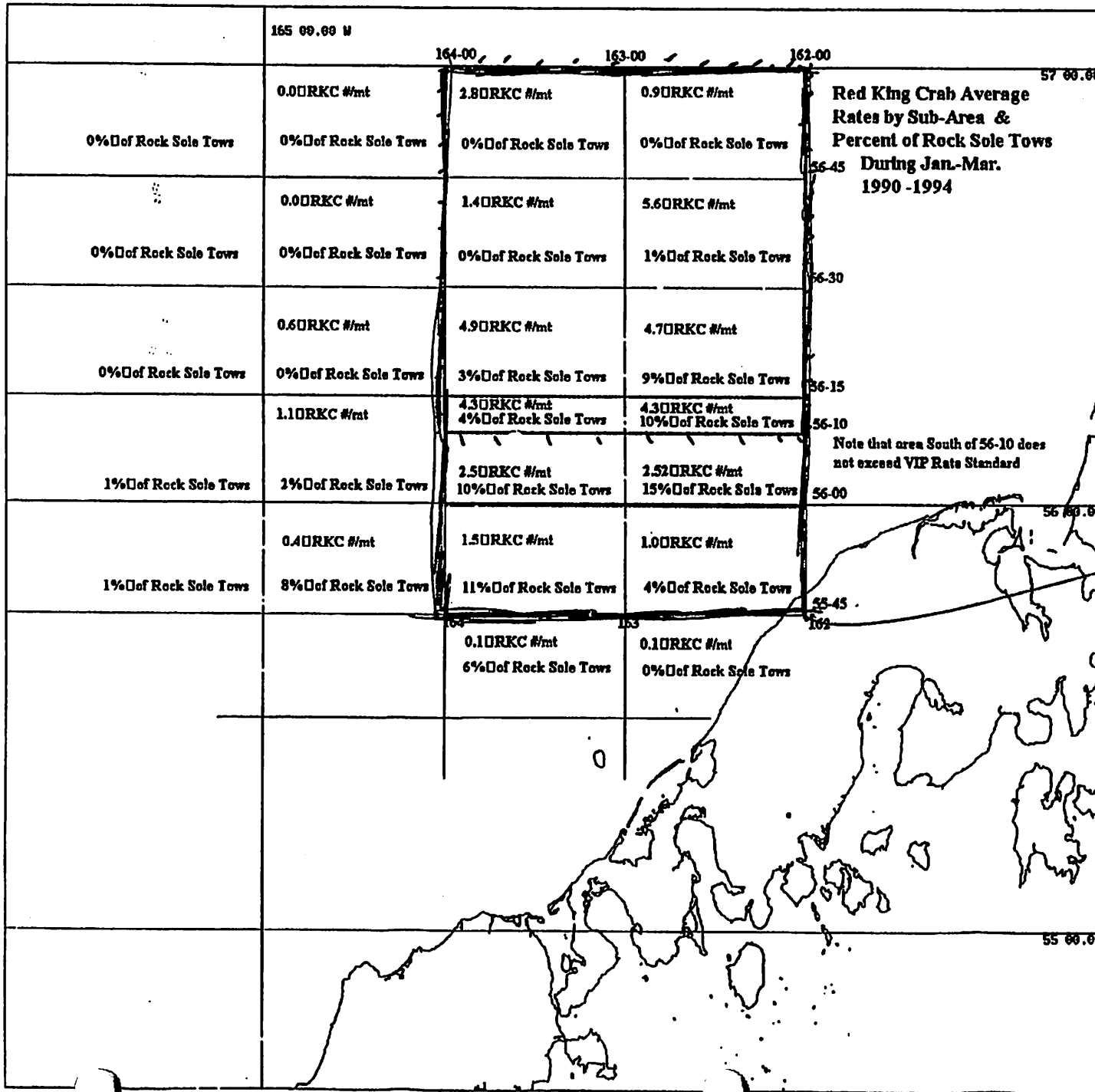
25.

Description of areas defined for closure. Alternative 1 includes numbers 2, 4, 6, 8, and 9;  
alternative 2 includes numbers 3 - 9;  
alternative 3 includes numbers 3 - 6;  
alternative 4 includes numbers 5 - 8;  
alternative 5 includes numbers 1 - 8. - All

Outline of areas proposed for closure



*Council Action would close all areas 1-10 south to 55° 45'*



Red King Crab Average Rates by Sub-Area & Percent of Rock Sole Tows During Jan-Mar. 1990-1994

Note that area South of 56-10 does not exceed VIP Rate Standard

*Chart / Table*  
*King Crab bycatch rates and percentage of rock sole tows by statistical blocks 1990-1994. (JAN-MAR)*

*Council Proposed closure*

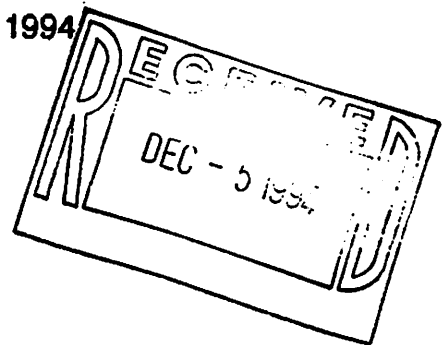


## *North Pacific Fisheries Association, Inc.*

HEADQUARTERS:

BOX 796 • HOMER, ALASKA 99603

December 5, 1994



Chairman Rick Lauber  
North Pacific Fisheries Management Council

Dear Mr. Lauber,

Our association has voted to adopt the Homer Crab Group management proposals. We urge the council to give careful consideration to these proposals and act quickly to protect the Bristol Bay Red crab stocks. We also want to thank the council for its action, on November 14, of closing some of the crab grounds to trawling. We believe this is a step in the right direction.

The Homer Crab Group proposes:

- 1) Make the new no-trawl zone a permanent rule change
- 2) Require observer coverage of all tows, employing sampling techniques that will allow successful prosecutions in courts of law for VIP rate abusers.
- 3) Existing PSCs should be directly related to stock abundance and in general need to be reduced to reflect current declines in each stock biomass. Lowering the existing PSCs will shift the "cost of prohibited species bycatch to others" to the trawl fleet, giving the trawl fleet a compelling reason to reduce bycatch of prohibited species through modification of fishing practices.
- 4) Establish a PSC for Opilio crab, which is less than the bycatch reported in 1994, consistent with the degree of decline in biomass between 1994 and 1995.
- 5) PCSs need to be resolutely enforced with ZERO TOLERANCE for overages for the trawl fleet in general and individual vessels which exceed VIP rates must be rigorously prosecuted.
- 6) Any overages of PSC should carry forward and be subtracted from the next year's PSC.
- 7) Daily reporting required with adequate database overview to allow timely closures so PSCs are not exceeded.

Thank you.

Respectfully,

Mako Haggerty, Pres.  
North Pacific Fisheries Association



COTTER

**DRAFT**

**REVIEW OF ALTERNATIVES TO ADDRESS DISCARD WASTE**

by  
**Larry Cotter**

**June 4, 1992**

The following alternatives and accompanying options are intended to encompass the full range in order to stimulate discussion and address the issue. I offer no preferences.

**DISCARD ALTERNATIVES**

**Alternative 1:           Status Quo**

No change; discards would continue to be allowed and required per existing rules.

**Alternative 2:           Prohibit Discards of Groundfish**

All groundfish for which a TAC exists would have to be retained and processed. PSC, whether groundfish or traditional species (salmon, herring, crab, and halibut) would continue to be discarded.

**Alternative 3:           Prohibit Discards of All Groundfish and PSC**

- Option A:**   Include all PSC.
- Option B:**   Exclude crab and halibut.
- Option C:**   Exclude crab, and halibut that is not mortally wounded.

**Note:** It is unlawful to purchase or process crab which is not alive; therefore, requiring retention and processing of crab taken as PSC would increase the mortality rate to 100%.

**TIME LINE ALTERNATIVES**

**Alternative 1:           Effective Date:**

- Option A:**   January 1, 1994
- Option B:**   January 1, 1995

**DRAFT**  
**REVIEW OF ALTERNATIVES TO ADDRESS DISCARD WASTE**  
June 4, 1992  
Page 2

**Alternative 2: Phase In Over Two Years**

**Option A: Groundfish**

1994 — \_\_\_% of groundfish may be discarded  
1995 — \_\_\_% of groundfish may be discarded

**Option B: PSC**

1994 — \_\_\_% of specified PSC may be discarded  
1995 — \_\_\_% of specified PSC may be discarded

**Alternative 3: Phase In Over Three Years**

**Option A: Groundfish**

1994 — \_\_\_% of groundfish may be discarded  
1995 — \_\_\_% of groundfish may be discarded  
1996 — \_\_\_% of groundfish may be discarded

**Option B: PSC**

1994 — \_\_\_% of specified PSC may be discarded  
1995 — \_\_\_% of specified PSC may be discarded  
1996 — \_\_\_% of specified PSC may be discarded

**PRODUCTION USE OF PSC ALTERNATIVES**

**Alternative 1: May be Processed into Any Form**

Product form could be meal or any other form, regardless of whether or not product is fit for human consumption.

**Alternative 2: Must be Processed into Human Consumptive Form If Possible**

Meal production for animal feed is last resort; enforcement problems inevitable.

**DRAFT**  
**REVIEW OF ALTERNATIVES TO ADDRESS DISCARD WASTE**  
June 4, 1992  
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**DISPOSAL OF PROCESSED PSC**

**Alternative 1:        Company Retains Product**

Company retains the processed product and can dispose of it as it wishes.

**Alternative 2:        Company Forfeits Product to Government**

**Option A:        Government Sells Product --- Proceeds to Research  
and/or Data Gathering Program**

**Option B:        Government Distributes Product to Food Aid  
Programs**

**COMPENSATION FOR OF PROCESSING PSC**

**Alternative 1:        No Compensation**

**Alternative 2:        Compensation for Processing Cost**

**GROUND FISH FISHERY MANAGEMENT PLAN AMENDMENT  
PROPOSAL**

**North Pacific Fishery Management Council**

**Name of Proposer:**

**Date: November 16, 1994**

**Cold Sea International, Inc.  
2909 Arctic Boulevard, Suite 100  
Anchorage, Alaska 99503  
Phone: 907-562-2653  
Fax: 907-561-3468**

**Fishery Management Plan: 1995 BSAI Rock Sole.**

**Brief Statement of Proposal:**

- a. 1995 BSAI Rock Sole be split into A and B seasons. A season should start in January, and B season should start in August.
- b. 50% of the TAC should be allocated to each of the seasons.
- c. Bycatch should also be split 50-50 between the A and B seasons.
- d. Retention:
  - (1) 60% of whatever is in the trawl/codend should be retained in the A season, and 75% should be retained in the B season.
  - (2) Exceptions: Arrowtooth, sculpin and skate should not be counted for the purposes of the 60% and 75% retention standards.
- e. Only those boats/fishermen who meet the above retention standards in the A season should be allowed to fish the B season. Only those who meet the standards for the A and B seasons should be rewarded by being allowed to take part in further allocations and/or reserve commitments.
- f. This value of the Rock Sole fishery increases from more than \$27 million under past policies and practices to more than \$45 million under this proposal.

**Objectives of Proposal: (What is the Problem?)**

- a. The first objective is to effect a dramatic reduction in the economic discards of the Rock Sole fishery during the 1995 allocation period. In general, it can

be stated that the current discard rate of about 66% will be reduced to about 33% during the first year of the implementation of this proposal. If as successful as expected, then this proposal can be continued under its present or even expanded standards.

- b. A second objective is to reduce the practice of pulse fishing, which has negative consequences on fishery management and conservation.
- c. A third objective is to increase opportunities to expand and diversify markets for the Rock Sole products. Rock Sole with Roe is now dominated by the Japanese market. Adding other product lines will encourage development of other markets, which decreases risks.
- d. A fourth objective is to require retention and use of economically viable fish which are now being consciously discarded. This includes non-Rock Sole species such as Pollock, Cod, Yellowfin Sole and others, all of which will have values in a range of, say, \$0.20 - \$0.60 per pound round frozen or H&G frozen. Since there is no incentive or requirement to retain these species during the Rock Sole fishery, they are very naturally being discarded to leave precious freezer room for the higher value Rock Sole with Roe. This proposal provides for correction of such practices and incentives to do so.
- e. It will be shown herein that the overall value of the Rock Sole fishery will be greatly increased by adopting this proposal, despite the allocation of 50% of the Rock Sole into a non-roe B season.
- f. This proposal is a reasonable first step toward the resolution of the large economic discard record of the Rock Sole fishery.
- g. It is possible that there will also be positive effects in bycatch, since it likely that the pace of fishing will be slower, allowing for the possibility of greater escapement of halibut. In addition, it would appear that King Crab bycatch could be reduced, since fishing seasons would be spread out into periods when the King Crab may not be present in the Rock Sole fishing grounds in as great a concentration as in the January - March period. The record of the first year's experience under this proposed regime will indicate the degree of positive effects this proposal will have on bycatch.

**Need and Justification for Council Action: (Why can't the problem be resolved through other channels?)**

- a. The Council is the responsible authority for the sound economic harvest of the resource, combined with effective conservation practices. This proposal is properly submitted to the Council for consideration and implementation. No other authority exists for such action.
- b. Increased political, environmental and media attention is being focused on the waste in the Rock Sole fishery. This attention emanates from national.

regional and local sectors as more and more information on the extent of the waste is promulgated.

- c. Unless positive steps are taken, the entire Rock Sole fishery could be shut down. Policy makers at all levels are demonstrating a recognition that the record of waste demands strong corrective action.
- d. Recent Council meetings signal a strong will on the part of the Council to take action in response to the problems in the Rock Sole fishery. Council's November 14 teleconference was an example of the Council's earnest attempt to respond to the problem, in this instance regarding the King Crab bycatch issue.
- e. The mechanism of splitting into A and B seasons is already established in the Pollock fishery. This mechanism was designed to control a Pollock fishery which was, at the time, a frenzied pulse-style fishery in danger of becoming dedicated solely to the harvest of the Pollock roe. To a very large extent, this is exactly the case with the existing Rock Sole fishery. Thus the mechanism should have a very healthy effect. It provides a management process which is known and tested by the Council and NMFS.

**Foreseeable Impacts of Proposal: (Who wins, who loses?)**

- a. Those who desire an increase in retention, with a concomitant strong reduction of economic waste, in the Rock Sole fishery are winners.
- b. Industry and market elements who can respond to the increased standards of retention are winners. Those who cannot respond are losers until they adapt, unless they simply move to another fishery.
- c. Public and private sectors interested in value-added industry for economic development will be winners, since it is certain that the value of retained resource in the A and B seasons will outstrip any loss of the roe in the A season. (See supporting data below.)
- d. Those who share tax revenues, to include the State of Alaska, its political subdivisions, and others, will be winners, since the base taxable value of the fishery will increase.

**Are There Alternative Solutions? If so, what are they and why do you consider your proposal the best way of solving the problem?**

- a. The Harvest Priority/Full Retention/Full Utilization concepts contain measures which present alternative solutions.

- b. Representatives of the Rock Sole fleet have presented the Council with steps which present alternative solutions. These include increased mesh size and voluntary reporting of bycatch hot-spots.
- c. This proposal has the following merits:
  - (1) It can be implemented immediately, since its management is familiar to existing authority. It would follow the patterns of the Pollock fishery.
  - (2) It responds quickly and effectively to the growing pressure from political, environmental and media sectors to do something to lessen or totally curtail the waste which is on record in the Rock Sole fishery.
  - (3) The proposal works with, as opposed to against, concepts which are contained in the Harvest Priority family of objectives.
  - (4) It delivers a large, quantifiable savings in the area of economic waste. Instead of a discard rate of 66% (for a total of 39,321 mt) as has occurred through November 5, 1994, the following figures could emerge in 1995:

75,000 mt	1995 TAC
63,750 mt	1995 ITAC
31,875 mt	A season ITAC (at 15% reserve)
19,125 mt	A season retention at 60%
31,875 mt	B season ITAC (at 15% reserve)
23,906 mt	B season retention at 75%

Note that 1994 rates shows a 34% retention rate, but 1995 would show under this proposal a 67.5% retention of Rock Sole ITAC in A and B seasons combined.

$$(19,125 + 23,906 = 43,031 \div 63,750 = 67.5\%)$$

**Supportive Data & Other Information: What data are available and where can they be found?**

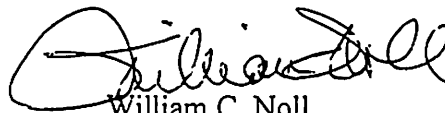
a. NMFS records catch and discard data for the Rock Sole fishery. From even a brief look at that data, it appears that this proposal should show savings not only in the Rock Sole fishery but also in others. This occurs because of the requirement to save a high percentage (60% and 75% in the A and B seasons, respectively) of economically viable fish which are in the codend. This means that usable species such as other flatfish,

Yellowfin Sole, Pollock, Cod and Plaice will have to be retained instead of being discarded as is now happening in the one-season Rock Sole with Roe fishery.

b. Various ADF&G reports identify the extent and kinds of waste. Most recently, their November 7, 1994, report discusses the issue of King Crab bycatch.

c. Attached are two scenarios which outline the values of the Rock Sole with Roe fishery at typical discard rates and the Rock Sole fishery as proposed herein. These two outlines provide a means of comparing the values of the Rock Sole fishery we have come to expect with the Rock Sole fishery under this proposal.

Respectfully,  
Cold Sea International, Inc.



William C. Noll  
Vice President



## Scenario I

### Rock Sole with Roe Fishery Typical, Based on Past Allocations and Practices

75,000 mt	TAC
63,750 mt	ITAC
42,075 mt	Discards (at 66%)
21,675 mt	Retained Rock Sole
13,005 mt	Rock Sole product, applying a 0.6 recovery factor.

#### Discussion.

a. Estimate two-thirds of the Rock Sole are retained during the roe season, and the remaining one-third is taken as allowable bycatch during the remainder of the year. This split would be typical of the fishery experience for the purposes of this discussion.

b. The two-thirds taken during roe season will be counted as female with roe at a value of \$1.20 per pound, and the remaining one-third will be counted as H&G frozen with a value of \$0.50 per pound.

c. Two-thirds of the Rock Sole product equals a total of 8,670 mt. Its value at \$1.20 per pound is about \$22,937,000. (Use 2204.6 pounds per metric ton.)

d. One-third of the Rock Sole product equals a total of 4,335 mt. Its value at \$0.50 per pound is \$4,778,000.

#### Conclusion.

\$22,937,000	Value of Rock Sole with Roe.
<u>4,778,000</u>	Value of other Rock Sole.
\$27,715,000	Total value of typical Rock Sole fishery under past allocations and practices.

## Scenario II

### Proposed Rock Sole Fishery Featuring A and B Seasons and Mandatory Retention

75,000 mt	TAC
63,750 mt	ITAC
31,875 mt	A and B season ITAC (each)

#### 1. Discussion, A Season.

a. During A season boats will retain all female with roe. This should represent about one-third of the A season ITAC catch.

b. The balance of the 60% retained during A season will be comprised of males and females with immature roe.

c. Based on these assumptions, out of the 31,875 mt A season ITAC, about 10,625 mt (one-third) will be female with roe. All of them will be retained. Applying a 0.6 recovery factor, there will be about 6,375 mt of the female with roe product. At a value of \$1.20 per pound, the value of this portion of the A season will be about \$16,865,000.

d. Since there is only a 60% retention of the ITAC required during A season, then the total required to be retained is 19,125 mt. Since 10,625 mt has been shown to be female with roe, we can assume that the remaining 8,500 mt will be male or females with immature roe.

e. Applying a recovery factor of 0.25 to the 8,500 mt yields 2,125 mt of product. At a value of \$1.00 per pound, the value of this portion of A season is about \$4,685,000.

#### 2. Discussion, B Season and Remainder of Year.

a. During B season there will be a requirement to retain 75% of everything in the codend (see above). However, it is assumed that, out of the 31,875 Rock Sole ITAC a much higher percentage will be retained. This will be true during B season, as well as allowable bycatch during the remainder of the year. For the purposes of this discussion, let us assume that 90% Rock Sole will be retained during B season and the remainder of the year as allowable bycatch, the remaining 10% being discarded for reason of being bruised, broken, crushed or otherwise economically unusable.

b. Under these assumptions about 28,687 mt of Rock Sole will be retained in B season and the remainder of the year. Applying a 0.25 recovery factor for processing yields about 7172 mt. At \$1.00 per pound, this gives a value to this portion of the Rock Sole fishery of \$15,811,000.

3. Combined Value of A Season, B Season and Remainder of Year.

\$16,685,000	A season females with roe.
4,685,000	A season, fillets.
<u>15,811,000</u>	B season and remainder of year, fillets.
\$37,181,000	Total value of Rock Sole products in proposed Rock Sole fishery.

4. Discussion, other values.

a. With the mandatory retention standards imposed during the A and B seasons, it is assumed that a large quantity of otherwise-discarded fish will be retained, processed to at least a minimum degree, and marketed. As mentioned earlier above, these species will include other flatfish, Yellowfin Sole, Pollock, Cod and Plaice.

b. For the purposes of this discussion, the proposal assumes that 10,000 - 20,000 metric tons of these fish will be retained instead of being discarded.

c. Using an average of 15,000 mt, further assume one-half of that volume is round frozen at an average value of \$0.20 per pound. Further assume that the other half is H&G frozen with a 0.6 recovery factor and at an average value of \$0.50 per pound.

d. These assumptions yield values of:

\$ 3,306,900	7,500 mt of round frozen at \$0.20 per pound.
<u>\$ 4,960,350</u>	7,500 mt at 0.6 recovery factor at \$0.50 per pound.
\$ 8,267,250	Other values of retained species in proposed Rock Sole fishery.

5. Conclusion.

The estimated total value of the Rock Sole fishery as proposed is:

\$37,811,000	Rock Sole products.
<u>8,267,250</u>	Products from other retained species.
\$45,448,250	Grand total.

6. Final Comparison.

\$27,715,000	Value of typical Rock Sole fishery under past allocations and practices.
\$45,448,250	Value of Rock Sole fishery, including other species retained, under this proposal.

## ALASKA FEDERATION OF NATIVES

## 1994 ANNUAL CONVENTION

## RESOLUTION 94-92

TITLE: REDUCE WANTON WASTE

- WHEREAS: more fish were discarded dead in federally managed fisheries in the North Pacific and the Bering Sea than were landed in the U.S. North Atlantic in 1993; and
- WHEREAS: over 740,000,000 pounds of marine life were dumped overboard in the Bering Sea and the Gulf of Alaska, including over 16,000,000 pounds of halibut and over 16,000,000 crab; and
- WHEREAS: in 1993 over 370,000 salmon were intercepted by the trawl fishery; and
- WHEREAS: these discarded crab, salmon, intercepted in Federal offshore waters are managed resources of the State of Alaska; and
- WHEREAS: these resources are the economic and cultural lifeblood for many Alaskans who depend on the sea for their livelihoods and subsistence; and
- WHEREAS: this continued wanton waste undermines any long term management strategy of sustained commercial, subsistence, and recreational fisheries, and places rural communities at risk; and
- WHEREAS: Alaska marine waters face declining wildlife populations and potential endangered species listings of several marine species that depend on fish for food; and
- WHEREAS: minimizing the catch of undersized species and reducing wanton waste will conserve fisheries resources for the present and future generations of subsistence users, commercial and recreational fishers, seafood industries, coastal communities, consumers, and the Nation; and
- WHEREAS: wanton waste now occurring in Federal fisheries of the Bering Sea and the Gulf of Alaska is of utmost importance culturally, economically, and ecologically;

NOW THEREFORE BE IT RESOLVED by the delegates to the 1994 Annual Convention of the Alaska Federation of Natives that AFN urge Congress to amend the Magnuson Act to enact a broad range of measures to reduce wanton waste in the North Pacific and Bering Sea fisheries, including harvest priority incentives for Clean Fishing Practices and other management tools.

SUBMITTED BY: Qawalangin Tribe of Unalaska

CONVENTION ACTION: PASSED



# Trustees for ALASKA

A Non-Profit, Public Interest, Environmental Law Firm

December 9, 1994

Richard B. Lauber, Chairman  
North Pacific Fishery Management Council  
321 Highland Drive  
Juneau, Ak. 99801  
HAND-DELIVERED

Dear Chairman Lauber,

Recently, the North Pacific Fishery Management Council (NPFMC or "the Council") recommended to the Secretary of Commerce that the Secretary issue emergency regulations to close a portion of the Bering Sea to trawling in the yellowfin and rock sole fisheries. As you know, the Council based this recommendation on the fact that crab populations in the Bering Sea are at alarmingly low levels. The Council is to be commended for taking emergency action to begin addressing this problem.

Moreover, as the Council is poised to consider amendments to the Bering Sea/Aleutian Island Groundfish Fishery Management Plan ("Groundfish FMP"), it is now time to set in place long-term protections for the depleted crab populations, such that the alarming decline in crab populations can be reversed, and the best long-term benefit to the nation of Alaska's fishery resources can be realized. As a follow up to our November 14, 1994 letter requesting emergency action (see Attachment A), Trustees for Alaska, a non-profit public interest environmental law firm, formally requests that the NPFMC amend the Groundfish FMP, as recommended below, both to protect and conserve the remaining crab and to manage fishery resources for the maximum benefit of everyone in the United States. Trustees for Alaska makes this request on behalf of itself, Fish Forever, a non-profit organization dedicated to cleaning up the world's fisheries, Farrar Sea Fisheries, Inc., Blue North Fisheries, Inc., F/V Sultan, F/V Tempest, F/V Blue North, Frank Abena, Ray Bellamy and Erling Skaar, all participants in the crab fisheries.

## Factual Background

The status of the crab stocks in the Bering Sea and Gulf of Alaska provided cause for the recent closure of all directed fishing on king crab in the Bering Sea and much of the fishing for bairdi tanner crab. See Alaska Department of Fish & Game (ADF&G) Emergency Order and News Releases (Attachment B). As ADF&G stated, "[t]he closure is necessary to ensure the future viability" of the king crab. Id.

At the same time, bottom trawling for some species of groundfish remained open in the areas closed to the directed crab fishery. This situation led the NPFMC recently to recommend that the Secretary of Commerce promulgate emergency regulations closing a portion of the

Bering Sea to trawling. See ADF&G, Addendum to the Draft Discussion Paper: An Analysis of red king crab bycatch in the Bering Sea with alternatives for trawl closures, p.2 (Dec. 2, 1994) (Attachment C). The Secretary has yet to act on the Council's recommendation.

Moreover, these fisheries are still operating in areas of particular sensitivity to the crab, and are operating with an NPFMC-sanctioned unreasonably high crab bycatch allowance. This situation does not reflect the crisis in the crab populations or the best use of the nation's fishery resources.

The crab fishery is prosecuted by more than three hundred vessels of various sizes from ports throughout Alaska, Washington and Oregon. There are more than two thousand fishers and support workers from Alaska, Washington, Oregon and other states employed on, and in support of, those crab vessels. The crab fleet operates out of at least fifteen communities, some of which are dependent on the crab fisheries for a significant portion of their employment for substantial parts of the year. These communities include the small Alaska coastal communities of Homer, Kodiak and Unalaska. In recent years, the ex-vessel value alone of the crab fisheries has ranged from over \$200,000,000 to over \$300,000,000. See Morrison, Gish, Bering Sea/Aleutian Islands Crab Fishery Reports by Management Area, March 1994, p.2 (Attachment D); NOAA Technical Memo NMFS-AFSC-27, Status of Living Marine Resources off Alaska, 1993, January 1994, p.2 (Attachment E).

The overall bycatch and discard rates of the crab fisheries off Alaska during the 1992 and 1993 seasons were insignificant. Virtually the only "bycatch" in those fisheries is the catch of prohibited females and undersized males which are released to the ocean alive.

In contrast, the portion of the bottom-trawl fleet which is prosecuting the yellowfin and rock sole fisheries is composed of approximately two dozen vessels. See e.g., Letter from Berger, J., NOAA to Karp, B., NOAA, September 22, 1994 (Attachment M). Thus, the Seattle-based factory trawl fleet prosecuting the yellowfin and rock sole fisheries in the areas closed to crabbing employs only a small percentage of the U.S. fishers and support workers employed by the crab fleet.

The overall bycatch and discard rates in the Bering Sea/Aleutian Islands catcher/processor yellowfin sole and rock sole fisheries during the 1993 season were 41% and 69%, respectively. The discard of crab in just those fisheries was 23,986 King crab, 9,371,253 Opilio and 983,404 Bairdi and other Tanner in the yellowfin sole fishery. In the rock sole fishery the loss was 235,254 King crab, 2,395,299 Opilio and 438,428 Bairdi and other Tanner crab. More than 112,000 additional crab of all species were taken in shore-based and mothership-based trawl fisheries for yellowfin and rock sole in 1993. See ADF&G, Draft Discussion Paper, An analysis of red king bycatch in the Bering Sea with alternatives for trawl closures, November 7, 1994 (Attachment F); see also Bering Sea Groundfish FMP at Table 25, p. 14-21 (1977-86).<sup>1</sup>

Not quantified, but very important, in this background analysis is the direct and indirect impact of the bottom trawl gear used in the yellowfin and rock sole fisheries on the essential habitat of the crab species. The nature of hard-on-bottom trawling is to disrupt the stability of the surface layers of the ocean bottom with the fishing gear. Species and gear specific information on the impact of hard-on-bottom trawling on the ecosystem is somewhat limited, yet as Council documents show:

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<sup>1</sup> Moreover, the fact that virtually all of the bycaught crab are killed is best-demonstrated by looking to the Crab FMP, which declares illegal trawl nets in the directed crab fishery "because of the high mortality rates which they inflict on nonlegal crab." Crab FMP, sec. 8.1.1, p. 8-3.

[t]rawling can disrupt the habitat of demersal fishes in four ways: 1) scraping and plowing the sea-floor, (2) sediment resuspension, (3) damaging or removing non-target benthic organisms, and (4) dumping of processing waste. . . . The extent and duration of the impact is related to the rate of recolonization and whether recovery is allowed to occur. Repeated trawling over the same area would presumably result in slow or no recovery of the lost habitat.

Ecosystem Considerations 1995, compiled by The Plan Teams for the Groundfish Fisheries of the Bering Sea, Aleutian Islands and Gulf of Alaska, NPFMC, p.65 (December 1994) (citations omitted) (Attachment G) (cited portions); see also, Crab FMP, p. 7-14 (discussing impact of trawling on crab).

Thus, as the Council's own findings reveal, the observed and imputed direct impact on the crab stocks and other fish populations is sufficient to warrant a very cautious approach to any continuation of the yellowfin and rock sole fisheries in areas which are coincidental with crab spawning, nursery or migration areas. The destructive impact on the fish habitat and the ecosystem provides very strong support for such caution. See id.

### **The Magnuson Act, the Crab FMP and the Groundfish FMP**

In 1976, Congress passed The Magnuson Fishery Conservation and Management Act to conserve, manage and protect the Nation's fisheries. 16 U.S.C. 1801(a)(5).<sup>2</sup> The Magnuson Act was intended primarily to halt and prevent overfishing – indeed, Congress noted that certain fish populations had been overfished “to the point where their survival is threatened.” 16 U.S.C. 1801(a)(2). Further, in passing the Act, Congress recognized that fishing constitutes a major source of employment and revenue to coastal communities and the nation. See e.g., 16 U.S.C. 1801.

Congress established a framework for implementation of the Act which called first for the establishment, through cooperative action of the states and the federal government, of Regional Fishery Management Councils. 16 U.S.C. 1852. Following their organization, the Councils were to develop fishery management plans (FMPs) with respect to those stocks of fish requiring conservation and management. Id. “Conservation and Management” is defined in the Act as follows:

Rules, Regulations . . . and other measures (A) which are required to rebuild, restore, or maintain . . . any fishery resource and the marine environment; and (B) which are designed to assure that . . . irreversible or long-term adverse effects on fishery resources and the marine environment will be avoided . . . .  
16 U.S.C. 1802(2).

Among other things, FMPs must contain an extensive biological, historical, economic and operational description of the fishery to be regulated, 16 U.S.C. 1853(a)(2), and an assessment of the present and probable future biological condition of the fishery and the maximum sustainable yield and “optimum yield” to be derived from the fishery, 16 U.S.C. 1853(a)(3). These assessments are to be based on the best statistical, biological, economic, social and other scientific information which can be gathered. 16 U.S.C. 1851(a)(2); 16 U.S.C. 1852(g)(1).

FMPs must also be consistent with the national standards for fishery conservation and management contained in 16 U.S.C. 1851. National Standard 1, for example, requires FMPs to

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<sup>2</sup> While understanding that the Council is certainly very familiar with the Magnuson Act, the Crab FMP and the Bering Sea Groundfish FMP, we offer our understanding of them as a foundation for further discussion.



"prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery." 16 U.S.C. 1851(a)(1). National Standard 5 provides that "[c]onservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources." 16 U.S.C. 1851(a)(5).<sup>3</sup>

Once approved by a Council, an FMP is submitted to the Secretary of Commerce for review, 16 U.S.C. 1854(a), (b), after which the Secretary may approve the plan or disapprove it in whole or in part. *Id.* Only plans found by the Secretary to be consistent with the national standards, other provisions of the Act and other applicable law may be implemented by final regulations. Amendments to FMPs, designed, for example, to react to new information respecting a fishery, follow the same approval and implementation procedure as FMPs. See 16 U.S.C. 1853-55.

When the NPFMC began considering overall management policy for fisheries off Alaska, it made several findings, including the following:

The fishery resources off Alaska are the property of the United States and should be managed for the benefit of everyone in the U.S. in accordance with the provisions of the Magnuson Act.

The lack of timely and adequate data has hampered Federal decision-making and management to the detriment of the resource and the economy.

Council Findings 2, 6, cited in Crab FMP at p. 1-2.

These and other findings led the NPFMC to conclude that it must develop FMPs to manage several fisheries off Alaska. From 1977 to the present, the NPFMC has managed the crab fisheries jointly with the State of Alaska under an FMP approved by the Secretary of Commerce. Crab FMP, pp. 1-2 to 1-7. This somewhat unusual joint management effort grew out of "a desire to optimize the use of limited State and Federal resources and prevent duplication of effort by making us of the existing State management regime." Crab FMP, p. 1-2. The Crab FMP defers much of the management to the State, although the Council retains oversight to ensure consistency with the FMP, the Magnuson Act and other law. *Id.*; see also Crab FMP at p. 3-1.

The management goal of the crab FMP is to:  
maximize the overall long-term benefit to the nation of the BS/AI stocks of king and Tanner crabs by coordinated Federal and State management, consistent with responsible stewardship for conservation of the crab resources and their habitat. Crab FMP, p. 7-1. In order to meet this goal, the Council adopted several management objectives. For example, the conservation objective is designed to ensure the long-term viability of crab populations and states that "maintenance of adequate reproductive potential in each crab stock will take precedence over economic and social considerations." Crab FMP sec. 7.2.1, p. 7-2.

Further, the economic and social objective provides that the FMP shall maximize such "benefits to the nation over time." Crab FMP sec. 7.2.2, p. 7-3. These benefits specifically

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<sup>3</sup> The Magnuson Act also provides that the Secretary of Commerce shall develop advisory guidelines to assist in the development of FMPs. 16 U.S.C. 1851(b). The Secretary has promulgated such guidelines, which are published at 50 C.F.R. Part 602.

include "profits, income, employment, benefits to consumers and less tangible or less quantifiable social benefits such as the economic stability of coastal communities." Id. Moreover, the Council stated that "social and economic impacts of BS/AI crab fisheries on coastal communities can be quite significant and must be considered." Id. at pp. 7-3 to 7-4.

The FMP also contains a Habitat objective, which provides that "[f]ishery managers should strive to ensure that optimal habitat is available for juvenile and breeding, as well as the exploitable, segments of the population." Crab FMP sec. 7.2.4, p. 7-6. Indeed, the Council went so far as to specifically recognize that crab "could experience high mortality as a result of mechanical crushing and bycatch in trawls." Crab FMP, p. 7-14.

The NPFMC also developed the Bering Sea Groundfish FMP, which was implemented by the Secretary of Commerce. This FMP was designed to achieve certain primary objectives:

1. Promote conservation while providing for optimum yield from the region's groundfish resources in terms of:
  - (a) Providing the greatest overall benefit to the nation with particular reference to food production and recreational opportunities;
  - (b) Avoiding long-term or irreversible adverse effects on fishery resources and the marine environment;
  - (c) Insuring availability of a multiplicity of options with respect to future uses of these resources.
2. Promote, where possible, efficient use of the fishery resources but not solely for economic purposes.
3. Promote fair and equitable allocation of identified available resources in a manner that no particular group acquires an excessive share of the privileges.
4. Base the plan on the best scientific information available.

FMP at sec. 3.0, p. 3-1; sec. 4.2, pp. 4-1 to 4-2.

The secondary objectives considered by the Council in preparing the Groundfish FMP include the following:

1. Conservation and management measures have taken into account the unpredictable characteristics of future resource availability and socioeconomic factors influencing the industry.
2. Where possible, individual stocks of fish are managed as a unit throughout their range, but such management is in due consideration of other impacted resources.
- ...
4. Management measures, while promoting efficiency where practicable, are designed to avoid disruption of existing social and economic structures where fisheries appear to be operating in reasonable conformance with the Act and have evolved over a period of years as reflected in community characteristics, processing capability, fleet size and distribution. These systems and the resources upon which they are based are not static, but change[s] in the existing regulatory scheme should be the result of considered action based on data and public input.
- ...
6. Fishing strategy has been designed in such a manner as to have minimal impact on other fisheries and the environment.

FMP at sec. 4.2, p. 4-2

The Bering Sea Groundfish FMP sets out as target fisheries both the yellowfin sole and rock sole fisheries. See id. at sec. 2.1, pp. 2-2 to 2-6. As described above, these fisheries are prosecuted by boats using trawl gear and the fishing practices utilized by these boats

include hard-on-bottom trawling; a fishing practice which leads to high bycatch rates and a high likelihood of habitat destruction. See e.g., Ecosystem Considerations 1995, p.65 (Attachment G); see also, Crab FMP, p. 7-14 (discussing impact of trawling on crab).

The Council recognized in the Groundfish FMP that it is “unable to predict the long-term effect on the ecosystem” of its management strategy. Groundfish FMP at sec. 9-7, p. 9-19. In part out of a desire to limit any long-term adverse effect on the ecosystem and those that rely upon it, the Council also set out a “bycatch control procedure to limit the incidental take” of crab and other fish species in the groundfish fisheries. Id. at sec. 2.1, p. 2-5. While the Council “advocates and fully supports development of domestic harvesting and processing of the groundfish of the Bering Sea and Aleutian Islands,” FMP at sec. 14.4.2, p. 14-5, it also recognized that a certain balance between such exploitation and conservation must be achieved. Thus, the Council “is fully committed to protection from needless waste of [crab] which are fully utilized in other domestic fisheries. Furthermore, in accordance with [Magnuson Act] provisions, the Council has a continuing obligation to assure their management in accordance with optimum use objectives.” Id.

### **The NPFMC Must Act To Protect The Remaining Crab And To Utilize Fishery Resources In The Best Interests Of the Nation**

Common sense and the law support, if not mandate, an amendment to the Bering Sea/Aleutian Islands Groundfish Fishery Management Plan to address the plight of the crab populations in the Gulf of Alaska and Bering Sea. From an economic and social perspective, moreover, it simply makes no sense to permit the continued waste of crab in the less-economically and socially valuable two dozen boat yellowfin and rock sole fisheries when approximately fifteen coastal communities and 300 boats are impacted by the closures and severe restrictions in the lucrative crab fisheries.

From an environmental perspective, once crab species have been declared by government managers to be in crisis, it flies in the face of logic to permit further mortality of those species. This is especially true given the fact that the method by which these crab are caught -- hard-on-bottom trawling -- not only kills individual members of the crab populations but also very likely destroys habitat necessary for the recovery of the crab populations. See e.g., Ecosystem Considerations 1995, p.65 (Attachment G); see also, Crab FMP, p. 7-14 (discussing impact of trawling on crab).

National Standard 6 of the Magnuson Act specifically gives the Council flexibility to address the incredibly high bycatch of crab in the yellowfin and rock sole fisheries: Conservation and Management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. 16 U.S.C. 1851(a)(6). In applying this national standard, the Secretary of Commerce advised the Regional Councils to recognize that:

Each fishery exhibits unique uncertainties. The phrase *conservation and management* implies the wise use of fishery resources through a management regime that includes some protection against these uncertainties. The particular regime chosen must be flexible enough to allow timely response to resource, industry, and other national and regional needs.

50 C.F.R. 602.16(b) (emphasis in original).

The NPFMC itself recognized that a prime motive for developing FMPs in the first place was to instill within it the capability of responding to conservation problems. See Council Findings cited in Crab FMP, p. 1-2. The Bering Sea Groundfish FMP also mandates that the Council work closely with the State of Alaska "to monitor . . . the activity in the fisheries" and to develop, "if necessary, [] amendments to the management plan," Groundfish FMP at sec. 17.0, p. 17-1, and the Crab FMP encourages action to protect crab stocks. See Crab FMP sec. 7.2.1, p. 7-2; sec. 7.2.2, p. 7-3; pp. 7-3 to 7-4.

Indeed, in past cases, federal courts have upheld federal fisheries managers' decisions to amend Fishery Management Plans out of a concern for excessive bycatch. In C&W Fish Co. v. Fox, 931 F.2d 1556 (D.C.Cir. 1991), for example, the court upheld an amendment to ban drift nets in certain coastal migratory pelagic fisheries. In so doing, the court deferred to the government's reasoning in applying the ban "that drift nets produce a wasteful bycatch of non-targeted species, most of which are discarded." Id. at 1562; see also National Fisheries Institute v. Mosbacher, 732 F.Supp. 210 (D.D.C. 1990) (court upheld an FMP amendment to protect billfish from overfishing by bycatch); Associated Vessels Services v. Verity, 688 F.Supp. 13, 17 n.8 (D.D.C. 1988) citing 50 C.F.R. 602.11(c)(3) and (4) (calculation of maximum sustainable yield takes into account stock peculiarities and environmental factors).

The specific mandates in the law which require the NPFMC to address the intolerably high crab bycatch in the yellowfin and rock sole fisheries arise from various statutory, regulatory and FMP provisions. As stated in National Standard 1 of the Magnuson Act, FMPs "shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery." 16 U.S.C. 1851(a)(1); see also, 50 C.F.R. 602.11(b) (emphasis added) ("The most important limitation on the specification of [optimum yield for each fishery] is that the choice of [optimum yield] -- and the conservation and management measures proposed to achieve it -- must prevent overfishing").

As stated in the Crab FMP, a crab "fishery will be closed entirely" if the crab stock is below its "threshold" level because "further removals from the spawning stock will further jeopardize the already uncertain ability of the stock to recover." Crab FMP p. 4-1; see also 5 AAC 34.080. "Threshold" is defined as the "minimum size of a stock that allows sufficient recruitment so that the stock can eventually reach a level that produces" maximum sustainable yield (MSY). Crab FMP p. 4-1.<sup>4</sup>

Due to the failure of king crab to meet this "threshold" level, as defined for that species, the State of Alaska, in consultation with NMFS, shut down the directed fishery for king crab. See Attachment B. Further, due to the interplay between king crab and tanner crab, the tanner crab fishery was also essentially closed. See id. citing 5 AAC 35.510. While neither the State of Alaska or NMFS technically stated that such stocks are "overfished," by declaring that threshold levels of abundance have not been met, they essentially state that the stock has an "uncertain ability" to recover. See Crab FMP p. 4-1; 5 AAC 34.080 (definition of "threshold"). As a practical matter, this "uncertain ability" to recover equates with an overfished stock.

To date, fisheries in the North Pacific are managed using a single-species approach, i.e., a separate and distinct FMP is developed for each fish species or class of fish species. As the current situation amply illustrates, however, the complexities and interactions in the ecosystem do not lend themselves to such simple classifications. Indeed, the Council recognized this in both the Groundfish and Crab FMPs, through discussions of and limits on, among other things,

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<sup>4</sup> MSY "is an average over a reasonable length of time of the largest catch which can be taken continuously from a stock under current environmental conditions." Id.

prohibited species caps and other bycatch limits and habitat damage by fishing gear and practices impacting other fish and fisheries. See generally Groundfish FMP; Crab FMP (background discussions; see e.g., Groundfish FMP, sec. 14.4; Crab FMP sec. 8.3.6, App. F (discussing prohibited species and habitat issues). Further, the Council's recommendation to the Secretary of Commerce that the Secretary issue emergency regulations closing a portion of the trawl fishery for a limited time, see Attachment F, also recognizes the interconnectedness of the fisheries.

Single-species management, does not, therefore, permit the Council or the Secretary of Commerce to ignore, from a management perspective, interactions between fisheries which may have an adverse impact on conservation of a fishery resource. Application of this principle to the case at hand, compels the conclusion that if a species is considered overfished (or not meeting its "threshold" level), not only should a directed fishery for that species be shut down, but no incidental take of that species should be allowed in any fishery. Thus, the Council should amend the Groundfish FMP to follow suit with the actions taken by the State of Alaska to allow the king crab stock to recover and once again produce MSY.<sup>5</sup>

Further, National Standard 5 provides that "[c]onservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources." 16 U.S.C. 1851(a)(5) (emphasis added). Thus,

[i]n encouraging efficient utilization of fishery resources, this standard highlights one way that a fishery can contribute to the Nation's benefit with the least costs to society: given a set of objectives for the fishery, an FMP should contain management measures that result in as efficient a fishery as is practicable or desirable.

50 C.F.R. 602.15(b)(1); see also 50 C.F.R. 602.15(b)(2) (efficiency "becomes a conservation objective [] where *conservation* constitutes wise use of all resources involved in the fishery, not just fish stocks") (emphasis in original); NPFMC Finding 2, Crab FMP, p. 1-2; Primary Objective 1(a) of the Groundfish FMP, sec. 3.0, p. 3-1; Crab Management Goal, Crab FMP sec. 7.1, p. 7-1.

The yellowfin and rock sole fisheries exhibit what is perhaps the epitome of the inefficient use of fishery resources.<sup>6</sup> Looking solely at ex-vessel prices for the bycatch, yellowfin sole and rock sole, as based on the average discard volumes and the amount of sole landed, one group of concerned crabbers has calculated the net loss to the nation at a very conservative \$14 million. Discussion Of The Impacts On Bristol Bay Red King Crab Of Rock And Yellowfin Sole Trawling And Non-enforcement Of PSC, prepared by Homer Crab Group, November 26, 1994 (Attachment H); see also ADF&G Censored Report on Bristol Bay Red King Crab Exvessel Price and Buying Data (Attachment I) (verifying ex-vessel price used in Homer Crab Group Report).<sup>7</sup> Given the historic value of crab, if one were to calculate this same net loss to

<sup>5</sup> While neither the State of Alaska or NMFS specifically concluded that the king crab stock is "overfished," the fact that it may not recover absent extreme management measures such as fishery closures strongly suggests that such is the case.

<sup>6</sup> As an initial matter, further restricting the yellowfin and rock sole fisheries in line with the suggestions detailed below will not automatically mean the return of the directed crab fisheries. Nevertheless, there is no question that a comparative economic analysis of the fisheries is relevant as reducing the bycatch rates will hasten the return of a healthy directed crab fishery. Additionally, the high crab bycatch rates in the yellowfin and rock sole fisheries, coupled with the likely crab habitat destruction caused by fishing practices in these fisheries, lead to the conclusion that a direct comparison of the costs and benefits to the nation of the crab, yellowfin sole and rock sole fisheries is relevant to the efficiency debate.

<sup>7</sup> The Homer Crab Group further documents and discusses the current situation in the Bering Sea with respect to crab and the yellowfin and rock sole and recommends some actions to address the problem. Rather than repeat wholesale their data, concerns and recommendations, we simply incorporate their paper, including

the nation using wholesale or retail values, the loss would be accentuated further. See e.g., ADF&G Censored Report on Bristol Bay Red King Crab Production and Wholesale Value Data (Attachment J) (providing wholesale prices); Pacific Fishing, relevant portions 1992 Yearbook, April 1993, Yearbook 1994 (Attachment L) (sample price charts).

Importantly, the average discard volume is based on far less than 100% observer coverage on the yellowfin and rock sole fisheries. Thus, while the landed sole figures are realistic, the bycatch figures are very conservative. Further, the directed crab fisheries do not have anywhere near the bycatch rates of the yellowfin and rock sole fisheries and utilize fishing practices which result in very little, if any, habitat damage. See Crab FMP, pp. F-12 to F-13. Thus, the "cost" of crab fisheries in terms of bycatch and habitat damage is negligible as compared to the yellowfin and rock sole fisheries. See Crab FMP; Groundfish FMP sec.s 3.0, 4.2.

From a purely economic perspective therefore, allowing these fisheries to proceed with such high crab bycatch rates in the face of alarmingly low levels of crab and the severe restrictions and closures placed on the more profitable (from a national perspective) crab fisheries violates National Standard 6. See Groundfish FMP, sec. 3.0, p. 3-1; sec. 4.2, pp. 4-1 to 4-2 (primary objectives 1-3); Crab FMP, pp. 7-1 to 7-5 (goals and objectives).<sup>9</sup>

Moreover, the relative support that each fishery provides to fishermen and the communities in which they live should also be factored into the efficiency equation. As detailed above, the directed crab fisheries involve some 300 boats and, at least in part, support as many as 15 coastal communities from Washington State to Kodiak, Homer and Unalaska. See supra factual background section. On the other hand, the yellowfin and rock sole fisheries support a mere two dozen boats. See supra factual background section. It is simply not "efficient" to jeopardize the livelihoods of a large group of fishermen, and a lifeline of 15 communities, for the sake of two dozen boats. See 50 C.F.R. 602.15(b)(2) (emphasis in original) (efficiency "becomes a conservation objective [] where *conservation* constitutes wise use of all resources involved in the fishery, not just fish stocks"); see also FMP at sec. 4.2, p. 4-2 (secondary objective 4); see also Crab FMP, sec. 7.2.2, pp. 7-3 to 7-5 (economic stability of coastal communities is a main objective of management).

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all data, concerns and recommendations, into our comments. Additionally, other concerned groups and individuals have prepared analyses and comments to the Council in earlier proceedings, see e.g., Letter from Blue, G, F/V Zolotoi to NPFMC, October 19, 1994 (Attachment N); Letter from Alaska Crab Coalition to NPFMC, November 8, 1994 (Attachment O), and we support these as well.

<sup>8</sup> Time and resource constraints did not allow us to make exact calculations of the net loss to the nation of allowing the trawl fisheries to continue with such high bycatch rates using wholesale or retail prices for each respective species. Nevertheless, the wholesale and retail prices as reflected in the attachments forcefully indicate that the net loss would be from two to four factors higher than the calculation using ex-vessel prices alone.

<sup>9</sup> In making this statement, we do not intend to suggest that, if the NPFMC addresses as described below the crab bycatch in the yellowfin and rock sole fisheries, the directed fishery for crab be returned to previous levels. That is a matter to be decided by the crab fishery managers, as based upon the best scientific information available.

### Recommended Actions

The following actions must be taken at the earliest possible time in order to protect the ecological and economic values of the crab populations in the Gulf of Alaska and the Bering Sea:

- \* All bottom trawling east of 165 W must be closed.
- \* A permanent closure of all bottom trawling within the 100 fathom curve must be established.
- \* A full analysis must be completed of the economic and ecological costs and benefits of a permanent closure of all hard-on-bottom trawling within crab spawning, nursery and migration grounds.
- \* Groundfish FMPs must be amended to require full observer coverage (every tow observed) for all vessels permitted to trawl within crab spawning, nursery or migration grounds.
- \* Efforts to continue or roll over existing bycatch caps in the yellowfin or rock sole fisheries must be defeated.
- \* FMPs for all trawl fisheries within crab spawning, nursery or migration areas must limit the duration of each trawl in order to minimize mortality of incidentally caught crab.
- \* There should be no allowable incidental take of Red King Crab in any fishery.
- \* If yellowfin and rock sole fisheries are allowed to continue, FMPs for those fisheries must contain substantially reduced bycatch caps for King crab and Bairdi. The caps for those species should be set as close to zero as possible which would still allow the fishery to be prosecuted, but in no case should the cap for any King Crab exceed 50,000 animals nor the cap for Bairdi more than 1 million animals. These caps must be strictly enforced.
- \* If any trawl fisheries are allowed within crab spawning, nursery or migration areas, a bycatch cap for Opilio crab should be established at no more than 1 million animals.

### Conclusion

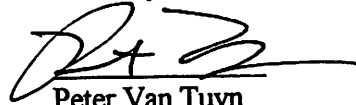
The goal of stopping the bycatch, especially the crab bycatch and the concurrent ecosystem destruction, occurring in the yellowfin and rock sole fisheries is vital. FMP amendments eliminating or severely restricting the yellowfin and rock sole fisheries will support the stock restoration being attempted through the State of Alaska's closure of the directed crab fisheries. In addition, by acting to address serious bycatch and fishery conservation problems, the Council, the Secretary and the National Marine Fisheries Service would go a long way toward restoring the confidence of the public in the fishery management process.

Recently, Senator Ted Stevens (R. Alaska) co-sponsored the Sustainable Fisheries Act, a bill designed to amend the Magnuson Act. In introducing this bill, Senator Stevens, speaking through Senator Kerry (D. Mass.), noted that "U.S. fisheries [ ] have suffered from destruction of essential habitat [and] destructive fishing practices." Congressional Record at S 14860 (October 7, 1994) (Attachment J). The Senators also noted that "[i]n many instances, minor management actions could have been taken sooner to avoid the need for more dramatic

measures later” and, in what is hopefully not a prescient comment relative to the crab situation, “the councils have sometimes reacted to developments in fisheries rather than anticipating problems -- even when upcoming problems are apparent.” *Id.* at S 14861 (emphasis added) (Attachment J).

We implore you to recognize what the facts will not hide; that some crab species in the Bering Sea are in dire straits. We appeal to you to take action now to address their plight and that of the many individual crab fishers and coastal communities which rely for their livelihoods on healthy crab populations.

Sincerely,



Peter Van Tuyn  
Litigation Director

cc: NPFMC Members (without attachments)  
NMFS



## ATTACHMENTS

- Attachment A: Letter from Trustees for Alaska, et al., to Chairman Lauber, NPFMC, November 14, 1994
- Attachment B: Alaska Department of Fish & Game (ADF&G)  
News Release, August 16, 1994  
Emergency Order, September 6, 1994  
News Release, September 6, 1994  
News Release, September 7, 1994
- Attachment C: ADF&G, Addendum to the Draft Discussion Paper: An Analysis of red king crab bycatch in the Bering Sea with alternatives for trawl closures, p.2, December 2, 1994
- Attachment D: Morrison, Gish, Bering Sea/Aleutian Islands Crab Fishery Reports by Management Area, March 1994 (cited portions)
- Attachment E: NOAA Technical Memo NMFS-AFSC-27, Status of Living Marine resources off Alaska, 1993, January 1994
- Attachment F: ADF&G, Draft Discussion Paper, An analysis of red king bycatch in the Bering Sea with alternatives for trawl closures, November 7, 1994
- Attachment G: Ecosystem Considerations 1995, compiled by The Plan Teams for the Groundfish Fisheries of the Bering Sea, Aleutian Islands and Gulf of Alaska, NPFMC, December 1994
- Attachment H: Discussion Of The Impacts On Bristol Bay Red King Crab Of Rock And Yellowfin Sole Trawling And Non-enforcement Of PSC, prepared by Homer Crab Group, November 26, 1994
- Attachment I: ADF&G Censored Report on Bristol Bay Red King Crab Exvessel Price and Buying Data
- Attachment J: ADF&G Censored Report on Bristol Bay Red King Crab Production and Wholesale Value Data
- Attachment K: Congressional Record at S 14860 (October 7, 1994)
- Attachment L: Pacific Fishing, relevant portions 1992 Yearbook, April 1993, Yearbook 1994
- Attachment M: Letter from Berger, J., NOAA to Karp, B., NOAA, September 22, 1994
- Attachment N: Letter from Blue, G, F/V Zolotoi to NPFMC, October 19, 1994
- Attachment O: Letter from Alaska Crab Coalition to NPFMC, November 8, 1994

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## ACTION PLAN

To reduce King and Tanner Crab bycatches in the groundfish fisheries of the Eastern Bering Sea

1. Make the new no-trawl zone (The area encompassed by 57 Degrees North and 55 Degrees 45 Minutes North Latitude and 162 to 164 West Longitude) a permanent rule change.
2. Establish a fixed PSC for Opilio crab.
3. Reduce Bairdi fixed PSCs to 1.5 million. The present cap of 4 million is non-constraining.
4. 100% observer coverage of all tows in flatfish fisheries in Zone 1 employing sampling techniques and with daily catch reporting that will allow successful prosecutions in courts of law for VIP rate abusers.
5. The Bristol Bay red king crab cap shall be resolutely enforced with ZERO TOLERANCE for overages for the trawl fleet in general. Individual vessels which exceed VIP rates must be rigorously prosecuted.