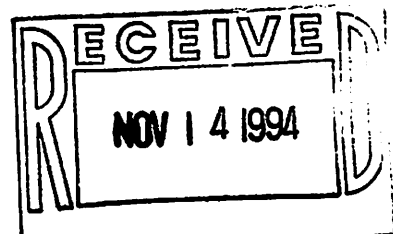


November 11, 1994



LATE COMMENT

MEMORANDUM

To: NPFMC Members
From: John Gauvin
Subject: Crab and Halibut Bycatch in the Rocksole Fishery

I have enclosed three color charts and one black and white chart/table that we feel are key to understanding the ramifications of a king crab closure for the rocksole fishery. These charts were developed from the same data file that Dave Ackerly used for his report. One key difference in the way we sorted the data, however, was that we looked at the bycatch rate for all trawling from Jan 1-March 30 in these areas. This means we intentionally included all tows, not just those of 25 tons or greater. This is because many rocksole tows do not exceed 25 tons of flatfish, and yet these smaller tows can be just as important for king crab bycatch.

The three color charts are labeled by the bycatch species information they display. These charts correspond to Figures 22, 23, 24 in Dave Ackerly's report (king crab, tanner crab, halibut), but in color and using data from all tows.

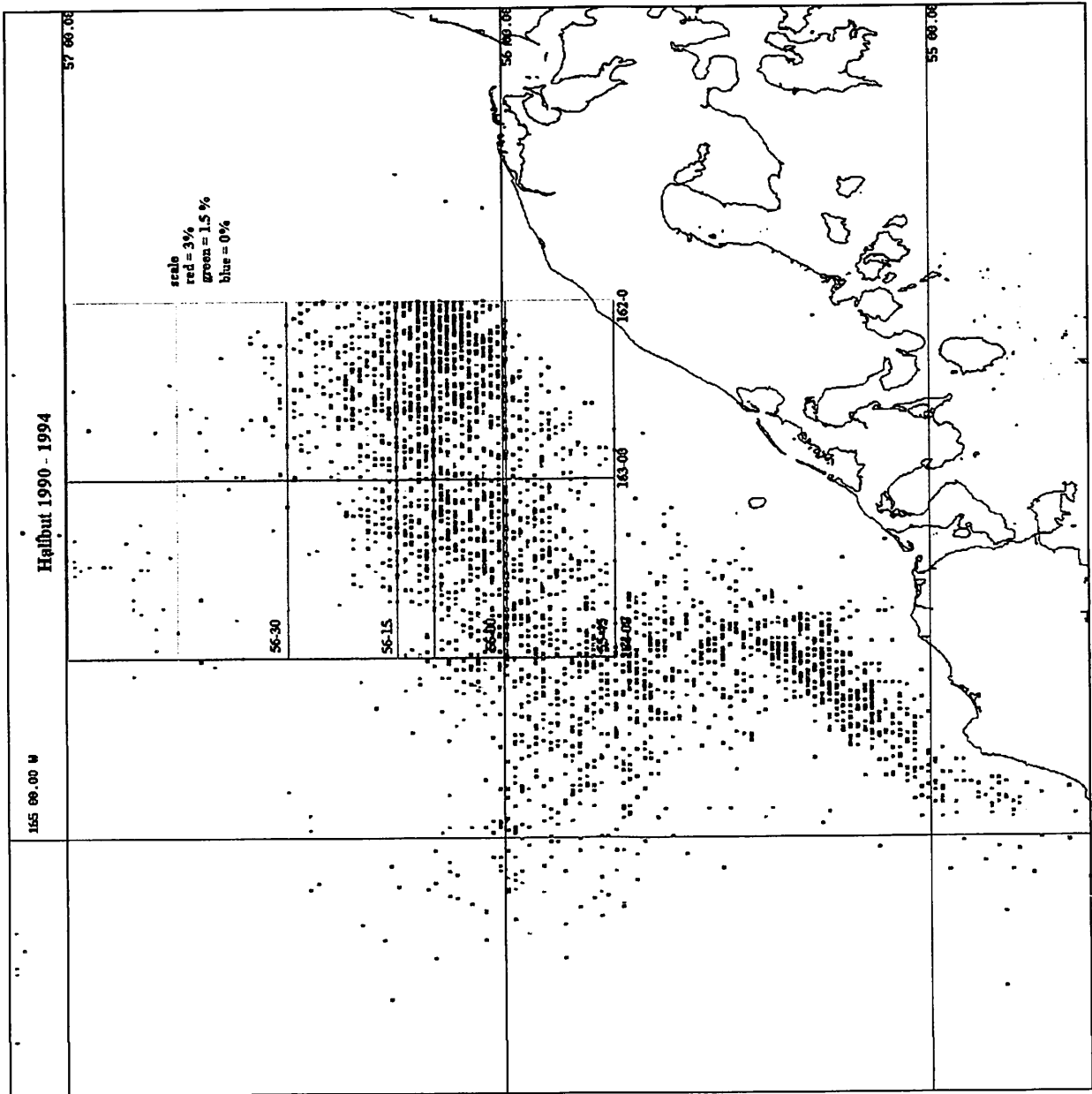
The black and white chart/table in our package gives a great deal of information on king crab bycatch. This chart/table gives the percentage of rocksole tows (1990-1994) and the king crab bycatch rates by statistical area. This information is useful for evaluating the relative king crab bycatch that can be expected from each area and the relative importance of each area to the rocksole fishery.

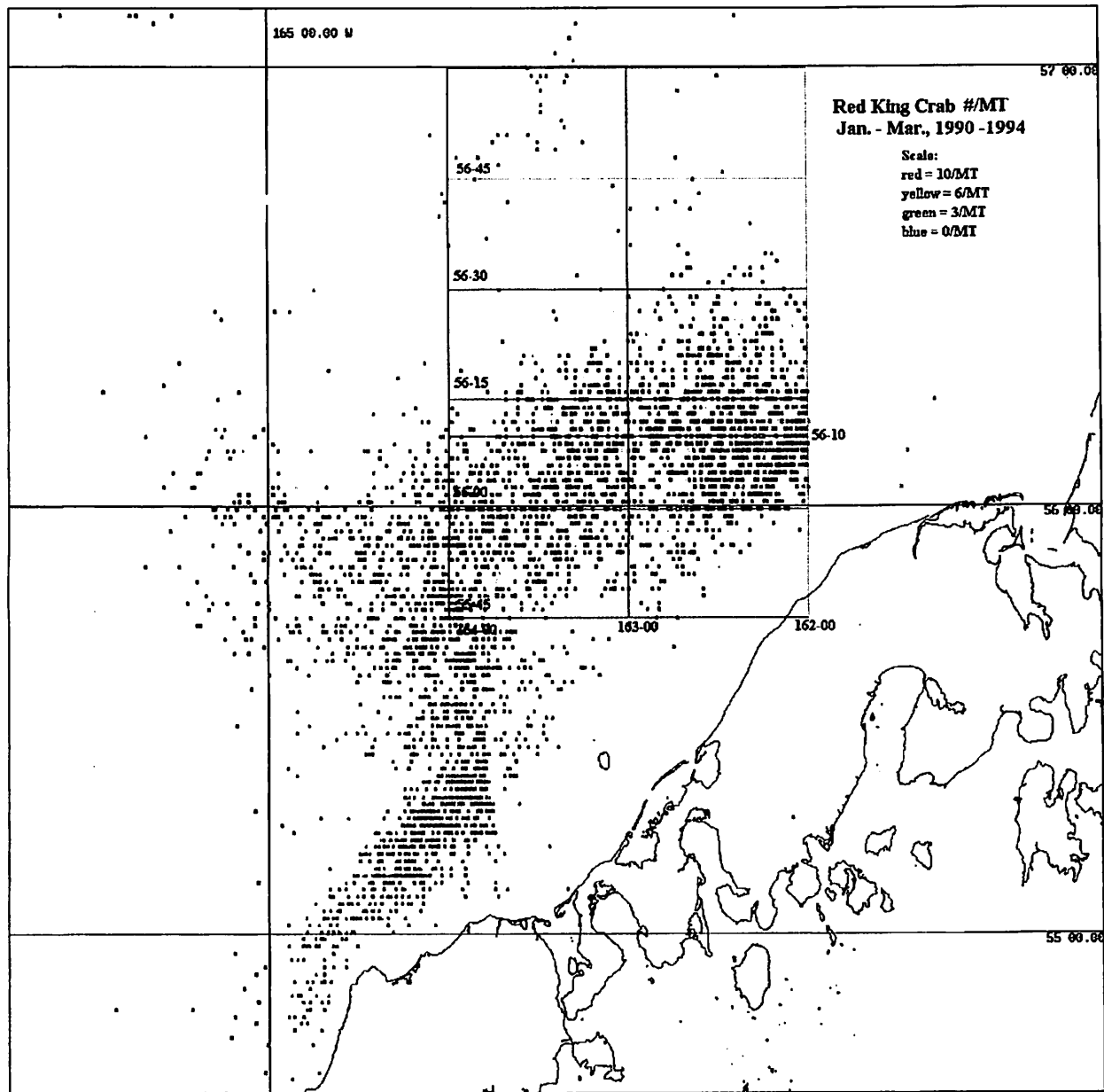
Our testimony for the telephone conference will refer to these charts as we explain our modified/improved proposal for a king crab trawl closure for the rock sole fishery. Our new proposal reflects the varying rates of king crab bycatch and the potential for tanner crab and halibut bycatch problems if the fishery shifts to areas west and south of its traditional grounds. We are proposing the most comprehensive closure (recognizing that the fishery needs some grounds where rocksole can be found) while seeking to avoid potential tanner and halibut problems. We look forward to the opportunity to explain our improved closure proposal and hope these materials serve to clarify the information available from Dave Ackerly's report. Thanks in advance for your time and attention.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Gauvin".

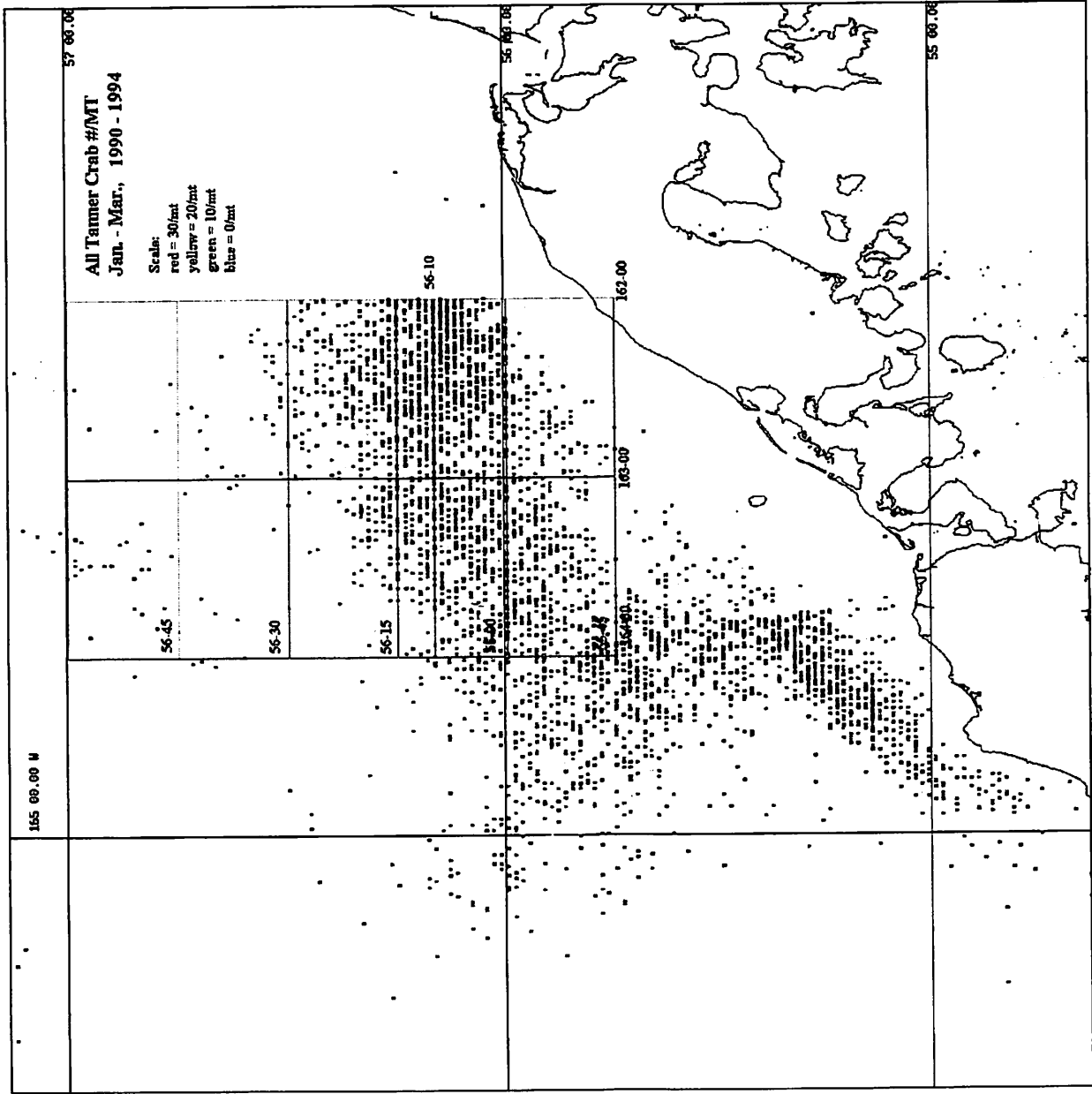
John R. Gauvin
fishery economist and rocksole group member





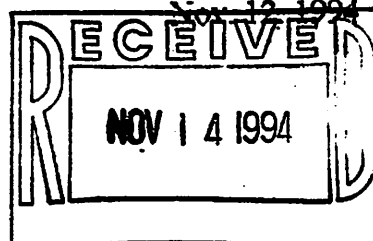
All Tanner Crab #/MT
Jan. - Mar., 1990 - 1994

Scale:
red = 30/mt
yellow = 20/mt
green = 10/mt
blue = 0/mt



LATE COMMERCIAL

Mr. Rick Lauber, Chairman
Dr. Clarence Pautzke, Executive Director
North Pacific Fishery Management Council
Post Office Box 103136
Anchorage, Alaska 99510



Re: Rock Sole Emergency Action

Dear Rick,

This letter will examine the proposed emergency actions relative to the rock sole fishery in the following four aspects:

- 1. Is there a biological emergency requiring a change in the cap, or economic emergency requiring a time/area closure?*
- 2. What sort of analysis is required to substantiate a time/area closure or PSC adjustment?*
- 3. Recommendations for emergency, intermediate and long term measures for Rock Sole.*
- 4. The need for adjusting the VIP standards.*

Caps - Is there an biological emergency?

No, there is not a biological emergency justifying a reduction of the overall Red King Crab cap. The when the cap was originally set it was set at a level that represented roughly 1/2% of the survey population of RKC. While the trawlers had requested a floating cap that would vary with changes in the survey population estimate, the council chose a fixed cap. While there has been some variation in the RKC population estimate since the cap was set, it still represents only slightly more than 1/2%. At the time the cap was set the SSC said that at anything less than 1% it was essentially background noise.

The major constraint on the RKC populations recovery is probably predation on larvae and juveniles by sole and cod respectively. Flatfish populations are at high levels of abundance. Thus measures which would reduce the harvests of flatfish TACs may actually impeded recovery of RKC stocks.

The EA/RIR for Amendment 12A (Sept. 16, 1988) page 21, stated that a 1% bycatch rate on RKC would reduce the harvestable amount of RKC in the pot fishery by a maximum of 2.9% after accounting for natural mortality given the age structure of the crabs taken as bycatch. On page 59 it indicated that for each 1000 crab allowed as bycatch there was a \$14,835 impact on the pot fishery, using the wholesale processed value of

\$5.75 per round weight pound. Allowing for a doubling of the price of RKC, each reduction of 10,000 crab in the cap for the rock sole fishery could be expected to provide an additional \$300,000 of revenue to the directed crab fishery at the wholesale level. If reducing the rock sole RKC cap by 10% resulted in a 5% reduction in the rock sole catch, and thus in wholesale revenue in the rock sole fishery, that would have a negative impact of over \$1,250,000 on the rock sole fishery. The cost benefit ratio is at best, negative 4:1.

Area Closures - Is there an economic emergency?

A better case can be made for an area closure than for a cap reduction on the basis of economic arguments, though whether these arguments constitute an emergency is a subjective question. Given the intense race for fish in the open access derby, no individual has an incentive to control their own bycatch (unless one assumed that the VIP program was actually functional). Thus, whatever cap the council sets is likely to be reached prematurely. The resulting failure to harvest the groundfish TAC within a fixed cap has consistently resulted in losses of potential revenue for fishers. It is in the interests of both the participants in the groundfish fisheries and the nation as a whole for effort to be directed away from areas of high bycatch by appropriate time/area closures. If bycatch of PSC can be held at low rates, groundfish catches can be maximized within the TAC. This in turn may provide benefit to the directed pot fishery for crab even without reducing the RKC cap, by reducing levels of predation.

The Requirements for an Appropriate Analysis

In order for time area closures to achieve the maximization of groundfish harvests within a fixed PSC cap it is necessary to use an optimization model to examine the impacts of effort redistribution resulting from an area closure. Such a model was written for the council by Terry Smith in the late 1980's. It has subsequently been refined by the author and others and is available to the council, but it has not been used in this analysis.

Parameters required by a bycatch simulation/optimization model include:

1. *Bycatch rates* for each PSC species by area. Area resolution should be as small as possible, probably 1/4 by 1/2 degree blocks.
2. Target catch *CPUE* by species on the same area resolution.
3. Target catch *species composition* on the same area resolution.
4. Knowledge of other *area closures* which constrain choices relating to effort redistribution.
5. Presumably the council has as one of its goals for optimization the reduction of waste, as well as the efficient utilization of PSC caps. This requires information in the model concerning size, sex and maturation differences in target species by area and time as they impact *utilization* of groundfish catch.
6. The model must predict the likely choices by fishers relative to *effort redistribution*. Because such choices are likely to be made primarily on the basis of

CPUE of target species in an open access derby, there will be a feedback loop in the model with other closures being triggered. To accommodate this the model must employ weekly or daily time steps. It must also predict changes in total effort in the rock sole fishery as other fisheries open or close.

Though such a model exists and has been employed in most other cap and closure analyses in the past it has not been used in this analysis. If it were to be used the data base relating to the above parameters would need to be updated and incorporated into the model.

To be an informed decision maker the council must either employ such a computer model, or feel it has sufficient understanding of the parameters and data to make these calculations on the "back of the envelope". Sensitivity analysis of the existing model to changes in the parameters and input data has been undertaken by T. Smith, J. Norris and others. These reviews of the model have shown that there is a great deal of sensitivity to input assumptions and that the predicted outcomes can vary widely. (See article by J. Wilson, et al in Marine Policy, entitled "Chaos, complexity and community management of fisheries" for an interesting discussion of the modeling of complex systems.)

If the council were to employ the "black box" approach of using a computerized bycatch simulation/optimization model, it is important that the public and the SSC have the opportunity to review both the structure of the model and the specific data and assumptions employed by the model. If on the other hand, the council attempts to think the problem through itself, the information and assumptions are no less important, nor is the need for public comment on them any less important.

One method of getting a grasp of the data needed to conduct this exercise is to employ GIS data mapping as Dave Ackley has done in his Discussion Paper. Unfortunately, a teleconference is the worst of all possible forums for employing this technique. Ideally, the council could have a display running off an online database. It could then zoom in on "hot spot" areas of concerns, looking at underlying fields of information on each PSC and target species within various time window. The constraints of using a paper copy in black and white, results in the loss of most of the dimensionality of data and the ability to follow up on questions raised by the data presentation.

Our input into the analysis

Faced with all these constraints we have acquired NMFS haul by haul data set for the 1990 - 1994 rock sole fishery from the Observer Program. It has been reviewed both with GIS data mapping software and with database software and color charts have been generated which recaptures some of the lost dimensionality of the data. Copies of these are being sent directly to each council member. These charts are consistent with and amplify the analysis done by Dave Ackley.

Despite the foregoing caveats, certain general observations emerge from a review of the data and from fishing experience with reference to the parameters outlined above.

1. - *Bycatch Rates* - There are clear trade offs between RKC rates versus halibut and tanner crab rates. The later are higher to the SW of 56/164 degrees and the former are higher to the NE. Therefore closures of the area of RKC bycatch will result in effort shifts which will in turn raise halibut and tanner crab rates.

2. - *CPUE* - During the Jan. - Mar. rocksole fishery between 1990 and 1994, the most concentrated effort has been in the two 1/2 by 1 degree blocks between 56 and 56.30, and between 162 and 164, which together have accounted for over 50% of the tows in the fishery (exclusive of the effort in the now closed Pribilof area). Redeployment of this much effort into areas of lower CPUE inevitably has negative bycatch implications for other species.

3. - *Species Composition* - Bycatch of cod and pollack is generally unwanted in a rock sole fishery and tends to be higher to the south of 56 degrees.

4. - *Area Closures* - Alternative areas utilized by the rock sole fishery in the past are no longer available. The twenty mile rookery closure around Amak and the new Pribilof closure both remove the next best choices of fishing grounds. Any redeployment of effort will be into areas with significantly lower rock sole CPUE.

5. - *Utilization* - Utilization of total groundfish catch will be negatively impacted by redeployment from areas of higher rock sole percentage and CPUE into areas that tend to have higher percentages of male rock sole, yellowfin, other flats and pollack bycatches.

6. - *Effort Redistribution* - Redeployment of effort may well result in early closure of rock sole fishing due to bardii or halibut PSC caps being reached. Effort would then shift into other fisheries including P cod in the BSAI, and flatfish in the GOA, accelerating the pace of those fisheries.

Proposed Action - Emergency, Intermediate and Long Term

Emergency

1. The RKC PSC cap should not be changed on an emergency basis. A mortality impact on the RKC population of 1/2 % does not constitute an emergency.

2. A time/area closure to avoid excessive RKC bycatch rates will serve to prolong the fishery. However a overly broad closure will shift effort with negative impacts on other species and fisheries. This is a complex optimization problem, however the rock sole fleet believes it is appropriate to close an area between 162 and 164 degrees, north of 56.15 degrees on an emergency basis.

Long Term

The solution to the optimization equations within fixed PSC and TAC constraints is best achieved by shifting the responsibility to individual fishers through individual bycatch accounts (IBAs) and ITQs for target species. This would also have positive impacts on changing the shameful utilization rates experienced in the rocksole fishery, by forcing operators to internalize the cost of wasted fish.

Intermediate Measures

While it is not specifically related to the red king crab issue, public concern over poor groundfish utilization rates in the rock sole fishery must be addressed if this valuable fishery is going to be allowed to continue. Initiative has been taken by the fleet to switch to single layer, 6" diamond mesh codends for the upcoming season, as an effective means of reducing the catch of unwanted small flatfish and pollack. Initial reports from boats using such codends this fall indicate jumps of 25% in usable fish. A modification of the action on new codend regulations taken at the October council meeting to provide for such codends as legal gear would be a positive step. (See attached letter requesting council reconsideration of the codend regulation.)

Though ITQs would achieve the same purpose, a regulation phasing in a requirement for higher utilization of flatfish could be a justifiable interim measure. There may be enforcement issues similar to the problems with the VIP program, if so it would be useful to identify to "bad operators" by posting discard rate data along with bycatch rate data on the NMFS BBS by vessel name.

VIP Rates

The intent of the VIP program is to penalize the "dirty dozen" and inspire the rest of the fleet to do a better job. Obviously the program is not working in the rock sole fleet, because the fleet average rate is higher than the VIP rate. If it was working we wouldn't need the area closure. Though the VIP program to date has been something of a sham, there exists the possibility that enforcement and NOAA-GC's prosecutors will suddenly begin making cases based on the VIP rates. So, while the program is generally ineffective, many of us do behave "as if" there was a VIP.

The possibility of VIP enforcement provides a real disincentive to making the switch to single wall 6" codends on a voluntary basis. This is because catching unwanted groundfish has the "benefit" of reducing your apparent PSC rate. The same numbers of PSCs are caught per tow in either case, but the groundfish denominator is smaller if you aren't catching the unwanted small fish. This "catch-22" argues for either making a large

mesh codend mandatory or abandoning the VIP (though Individual Bycatch Accounts would be clearly superior to either).

Given the initial indications on the lowered capture rate of unwanted groundfish by large mesh codends, it appears it would be appropriate to adjust the VIP rates for the rock sole fishery upward by 30% for crab and halibut.

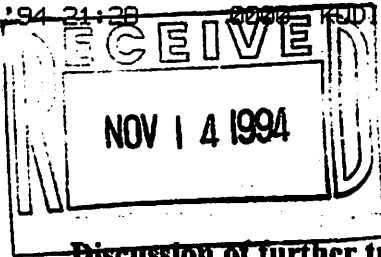
Conclusion

1. *Don't adjust to RKC cap, there is no biological emergency at the 1/2 % level.*
2. *Impose a closure from 162 to 164 north of 56.15 degrees.*
3. *Adjust the VIP rates and encourage the use of single layer 6" codends.*

Sorry about the lateness of this comment, but having recieved the haul by haul data from the observer program just a week ago, it took some time to examine the data to be able to make an appropriate recommendation on a closure area. Hopefully the chartlets being sent to you separately will be useful and any question you have can be answered in public comment.

Sincerely yours,

david fraser
F/V Muir Milach
P.O. Box 771
Port Townsend, Washington



LATE COMMENT

Discussion of further trawl closures in the eastern Bering Sea in order to reduce mortality on red king crab biomass:

1. The biomass of red king crab in the Bering Sea is 34 million crab in 1994. The bycatch of red king crab in the rock sole/ o. flat fishery in the Bering Sea was 156,938 crab as of April 23. This is less than one half of one percent of the estimated biomass.
2. NMFS mortality studies indicate that the mortality of these discarded king crab is equal to or less than 20% (when the crab are captured for five hours or less as is the case with the roe rock sole fleet). This number is less than one tenth of one percent of the estimated biomass. The variations in actual survival are enumerated in "Survival of King and Tanner Crabs Captured by Commercial Sole Trawls" by Bradley G. Stevens of NMFS.
3. According to NMFS predation studies, crab predation by groundfish is considered an important cause of red king crab stock declines.
4. Rock sole, according to NMFS surveys, is a large and increasing biomass in the Bering Sea. As a species, its ABC is exceeded only by that of pollock.
5. According to NMFS predation studies, the rock sole diet is increasingly made up of crab. According to NOAA Technical Memorandum NMFS F/NWC-207, "Rock sole and Alaska plaice...are growing parts of the groundfish biomass in the eastern Bering Sea and consideration of their predation is becoming important." According to the report, the rock sole which consume the highest percentage of crab are those from 12 to 17 inches in length. This size rock sole is the one removed in the largest numbers during the roe rock sole fishery. (See Note 1.)
- 6 Trawl closures of areas of higher king crab abundance which were producing higher king crab bycatch in trawl fisheries have not improved king crab abundance in any of those areas.

Questions:

1. What is the effect of reducing numbers of predators of a species versus the effect of reducing mortality due to fishing?
2. If rock sole is a predator of crab AND if rock sole is increasing in abundance AND if fishing in the most productive rock sole areas is prohibited and so results in an increased population of the larger rock sole which are crab predators; THEN, will the increased numbers of rock sole left offset any gains made by reduced fishing mortality?
3. Has the analysis been done which will assure that reduced fishing mortality will not be offset by increased predation?
4. Why have previous trawl closures not slowed declines in crab stocks?

5. If predation is a cause of poor crab recruitment, then is a management action which results in increased survival of predators unwise?

In conclusion, the rock sole fleet is initiating voluntary measures which will allow rapid feedback to the fleet of bycatch hot spots which will work to minimize bycatch. Further, the fleet is also switching to a larger mesh codend in order to minimize bycatch in the rock sole fishery. In addition, the fleet is also voluntarily taking NMFS biologists in order to further study the crab bycatch and the crab mortality issues.

Given the lack of analysis of the increased predation vs reduced fishing mortality, are such management actions which, by the most conservative estimates, will cost \$27 million to the rock sole fleet advisable and of the highest value to the nation?

Though we accept that the rock sole fleet can and should make efforts to reduce king crab mortality, we now are not sure that area closures are going to be the most effective manner in which to accomplish this. There are too many unanswered questions as to the benefits of such closures. Before any closures are enacted, we believe that there should be further analysis of :

1. The issue of actual mortality of king crab rather than that of total take.
2. The issue of increasing the number of predators versus decreasing fishing mortality.
3. The lost value of the roe rock sole fishery against unknown gains (and possible losses) to the king crab stocks.
4. The unknown gains (and possible losses) to king crab stocks created by area closures against the reductions in catch and mortality due to the voluntary actions of the rock sole fleet.

MARK P. KANDIANIS
KODIAK FISH COMPANY
11/13/94

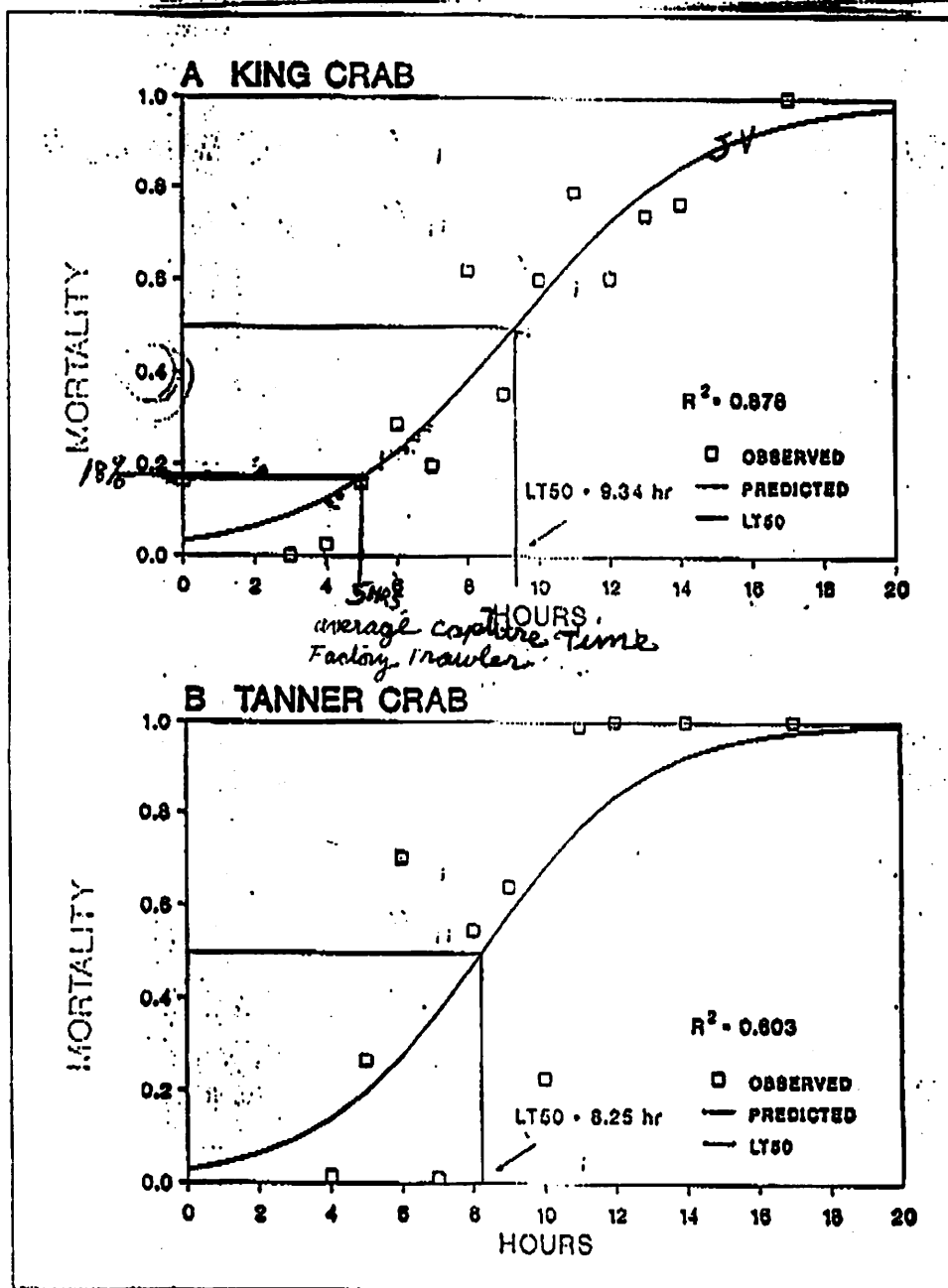
Note 1. If the roe rock sole fishery produces 47,057 mt of rock sole and if 50% of that comes from the two stat areas proposed for closure; then that means that about 69 million rock sole in the larger sizes will be left in these two areas rather than removed. In order for the closure to produce a net gain of king crab, those 69 million fish would have to consume less than 31,000 king crab (20% of the total take of king crab in the rocksole/o flat fishery).

Survival of King and Tanner Crabs Captured by Commercial Sole Trawls

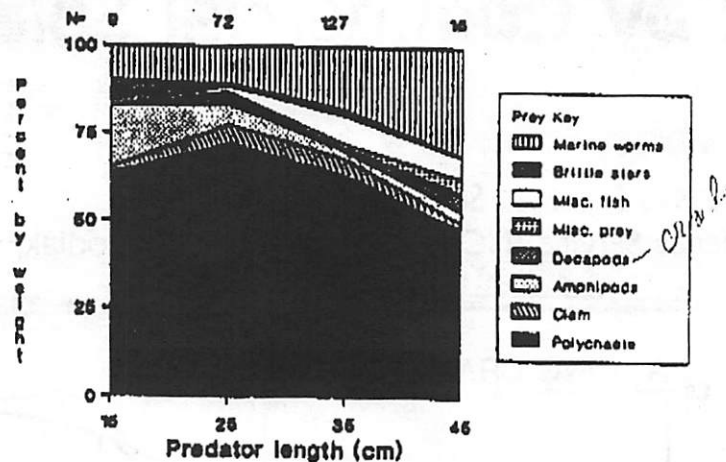
Bradley G. Stevens

Kodiak Laboratory, Alaska Fisheries Science Center

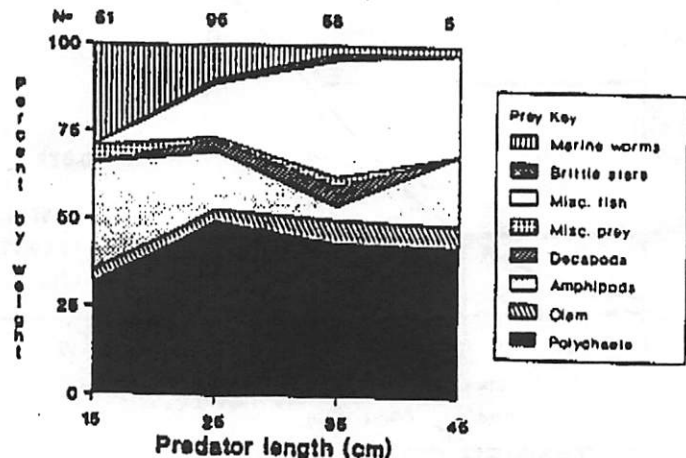
National Marine Fisheries Service, NOAA, P.O. Box 1638, Kodiak, Alaska 99615



1987 (Months 5-9)



1988 (Months 5-9)



1989 (Months 5-9)

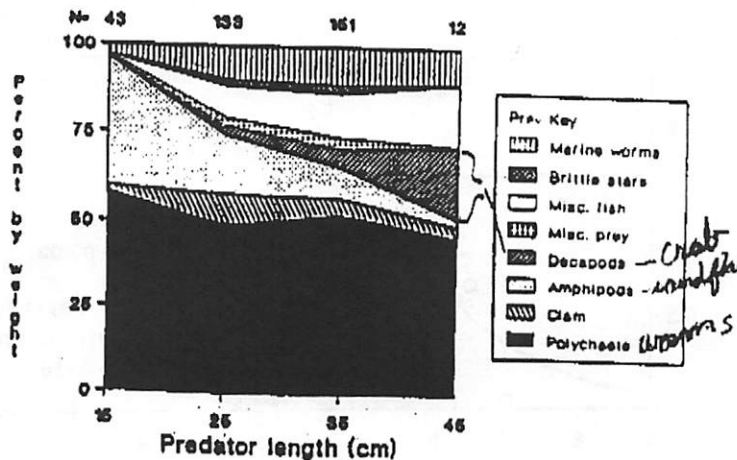
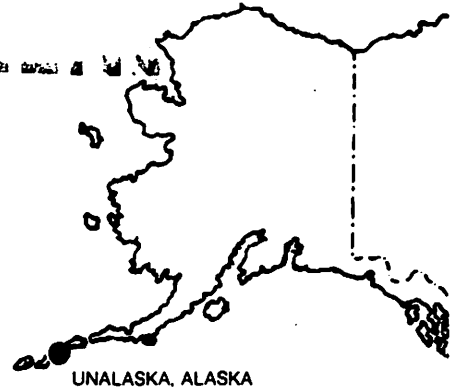


Figure C-3.--Annual diet composition of rock sole in terms of percent by weight, months 5 through 9, by predator size in the eastern Bering Sea, 1987-1989. N=number of stomach samples.

CITY OF UNALASKA

P.O. BOX 89
UNALASKA, ALASKA 99685
(907) 581-1251
FAX (907) 581-1417



FAX CONFIRMATION
Sent _____ Rec'd 11/14/94

November 9, 1994

Mr. Richard Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Ave.
Anchorage, Alaska 99501

Dear Chairman Lauber and Council Members,

The City of Unalaska is submitting written comments for the November 14, 1994 teleconference meeting of the North Pacific Fishery Management Council.

The City of Unalaska is very concerned about the declining crab stocks in the Bering Sea and the effects of crab bycatch in the trawl fisheries in the Bristol Bay area on this declining resource. The Red King crab stocks are at an all time low and the Bristol Bay Red King crab fishery was not opened this fall. The Bairdi Tanner fishery in the Bering Sea was also effected, the State of Alaska Board of Fish mandated that if the Bristol Bay Red King crab fishery did not open, they would not allow a Bairdi Tanner fishery east of 163 degrees west to further protect the Red King crab stocks. This has gone into effect this fall, further impacting the Bering Sea crab fleet by reducing the GHF for Bairdi Tanner by 50%.

Closed and shortened crab seasons have a very adverse effect on our community. Many of the 250 crab harvesting vessels use our local businesses to purchase services, fuel, groceries and gear. They also sell their crab here to shoreside processors. The reduced or eliminated quotas are felt very strongly here in Unalaska. It impacts local businesses, the municipality and the State in terms of lost revenues. These include, but are not limited to; State raw fish tax, local landing taxes and sales tax on goods and services provided.

The decline of the crab stocks in the Bering Sea is an important issue that we feel the Council should address. We know there is uncertainty as to whether the decline in crab stocks should be attributed to natural, cyclical downturns, increased pressure on the resource from high bycatch rates in several of the bottom trawl fisheries, bycatch of crab in the direct crab fisheries and/or mortality associated with lost pots that ghost fish. We would urge the Council to review the information that is available on bycatch of crab in the Bering Sea to see where it occurs at the highest levels, obtain information on the sex and size of the crab taken

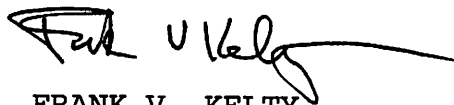
Mr. Richard Lauber
November 9, 1994
Page Two

and the times of year when this bycatch is concentrated. If more research is needed, funding for this research should be obtained. The Council has tools at it's disposal to make a difference and reduce crab bycatch. Possibilities are adjusting the vessel incentive program rate standards, lowering of bycatch caps on selected trawl fisheries, and not allowing the caps that are in place to be exceeded. An example of exceeding caps is the 1994 Rocksole fishery cap on Red King crab in zone one which was exceeded by 80,000 crab, 73% over the cap. The same has happened on the Bairdi Tanner caps in zone one and two in the Yellowfin and Rocksole fisheries. Another possibility is to expand the no trawl zones that are already in place. The City of Unalaska feels that all these issues should be looked at and your decision should be based on the best research information available.

At this time, the City of Unalaska supports the Crab Plan Team's recommendation to the Council from their September meeting which is that the Red King crab bycatch cap in groundfish fisheries east of 163 degrees be placed at zero because of the severity of the stock conditions of Red King crab in the Bristol Bay area and the necessity of implementing protective measures.

Thank you for giving us the opportunity to comment on a very important issue to the City of Unalaska.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank V. Kelty", with a long horizontal flourish extending to the right.

FRANK V. KELTY
Mayor



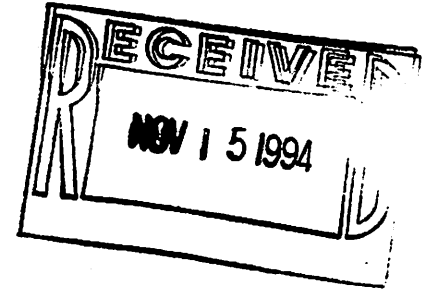
North Pacific Fisheries Association, Inc.

LATE COMMENT

HEADQUARTERS:

BOX 796 • HOMER ALASKA 99603

All Members
North Pacific Fisheries Management Council
605 West 4th Ave
Anchorage, Alaska 99501



November 3, 1994

Dear Councilman,

NPFA is very concerned about the cancellation of the Bristol Bay red crab season. We believe this constitutes an emergency and requires immediate action from the North Pacific Fisheries Management Council.

NPFA suggests to the Council that the rock sole and yellowfin sole hard bottom trawl fisheries be closed east of 165' west in order to protect the red crab stocks.

We further recommend 100% observer coverage for ALL TRAWL activity in the Bering Sea. There is no incentive for clean fishing with no observers on board.

NPFA would also request careful consideration of a substantial lowering of PSCs in the trawl fishery as a means of reducing the impact on the Bering Sea crab stocks.

Respectfully,

Mako Haggerty,
NPFA / pres

for Mako Haggerty

Drew Scalzi
NPFA / vice pres

Drew Scalzi