


MEMORANDUM

TO: Council, AP, and SSC Members

FROM: Clarence G. Pautzke 
Executive Director

DATE: April 14, 1993

SUBJECT: Groundfish Plan Amendments

ACTION REQUIRED

- (a) Initial review of proposed salmon bycatch Vessel Incentive Program.
- (b) Final action on BSAI Chinook salmon bycatch controls (Amendment 21b).

BACKGROUND

Salmon bycatch controls originally were part of Amendment 21 to the BSAI FMP. In April 1992, the Council reviewed the document and requested additional analysis. The SSC suggested using 1990 and 1991 data separately for runs of the Bering Sea Bycatch Simulation Model, and including information on Chinook salmon escapement estimates for western Alaska stocks. The Council requested that time/area closures be considered also. Staff from ADF&G, the primary authors of the analysis, incorporated these suggestions into the analysis.

In January 1993, the Council again reviewed the analysis, which included an examination of time and area patterns in chinook bycatch based on a Geographical Information System (GIS). The Council voted to release the document for public review after including 1992 catch data and assessing the impacts of salmon bycatch on Western Alaska salmon fisheries and escapement. The Council also requested analysis of Vessel Incentive Program (VIP) alternatives for chinook salmon bycatch in the BSAI trawl fisheries.

I suggest that the Council first hear the report on the proposed salmon VIP, how it will operate, and its expected impacts. At this meeting you need to decide whether to send the amendment out for public review. VIP documents will be provided by NMFS at meeting time. Then, having discussed the potential VIP program, the Council should consider final approval of the salmon bycatch Amendment 21b. The level of impacts imposed on the groundfish fisheries are very much related to the anticipated effectiveness of the VIP.

The revised Draft EA/RIR/IRFA for Amendment 21b to the BSAI FMP was sent to you on March 17, 1993. Due to the number of alternatives and sub-options, I have attached as Item D-2(e)(1) an Executive Summary of this analysis, which includes the alternatives considered, maps showing the areas proposed for closure, and a summary table of the potential impacts of the various alternatives.

If the Council does not feel comfortable making a final decision on salmon bycatch controls without having dealt with the VIP issue, your final decision could be delayed until June. That schedule would still allow both programs to be in place for 1994.

Item D-2(e)(2) is a letter from Carl Rosier conveying ADF&G's recommendations on salmon bycatch.

**EXECUTIVE SUMMARY
SALMON BYCATCH - AMENDMENT 21b**

I. Background

An initial proposal was submitted to the North Pacific Fishery Management Council (Council) on August 8, 1991 by the Yukon-Kuskokwim Task Force. The brief statement of the proposal was as follows:

To set an annual bycatch cap for the interception of chinook salmon in the Bering Sea at 0.004 salmon/mt, apportioned to different fisheries based on historic percent of bycatch, and enforced with mandatory time/area closures once that fishery in general, or that fishery in a certain area at a certain time reaches its apportioned cap.

The analysis of the proposal was conducted by the Alaska Department of Fish and Game, the Commercial Fisheries Entry Commission, and Council staff and presented to the Council at the April 1992 meeting. In order to provide the Council with a wide range of options to consider, the analysis was expanded to include the following:

- 1) four different assumptions about chinook salmon in a Vessel Incentive Program (VIP);
- 2) a range of four possible caps including the cap prescribed in the proposal (0.004, 0.008, 0.012 and 0.024 chinook/mt);
- 3) three different area closure options based on combinations of statistical areas; and
- 4) two different scenarios based on time or duration of closure.

The above analysis, which was based on the Bering Sea bycatch simulation model, showed that the more restrictive the cap, the greater the loss in benefits to the nation due to early closures of the groundfish fisheries. The analysis also showed that the more finely resolved the area and time definitions (e.g. more separate areas and time periods which took into account the high bycatch early in the year), the less negative were the impacts on the groundfish fisheries while still controlling chinook bycatch. The analysis also indicated that as the effectiveness of the VIP program increased, the costs to the groundfish fisheries were reduced (without consideration of management costs).

Following presentation of the analysis in April 1992, the Council followed AP recommendations that an alternative be included to examine the effects of time and area closures in the absence of a cap. The SSC had also recommended that the model be re-run using the data from 1990 and 1991 separately (rather than averaging the two) to allow maximum bycatch rates in the model.

The analysis presented in January 1993 included an examination of time and area patterns in chinook bycatch based on a Geographical Information System (GIS) which could precisely locate individual hauls from observer data. The analysis reiterated the findings of the National Marine Fisheries Service that chinook salmon bycatch is highest during the months of January - April and September - December. Bycatch also tended to be higher in the vicinity of Unimak Island and along the 200 m contour which extends to the north and west of Unimak Island. A series of buffer strips were

constructed which extended for 5, 10 and 15 miles on either side of the 200 m contour line, and catch and bycatch were compared within and outside of the buffers. Data from the foreign, joint venture, and domestic fisheries indicated a much higher bycatch and rate of bycatch within the buffer strips and in the blocks near Unimak Island than outside of these strips and blocks. The data also indicated that groundfish catch per tow did not vary greatly inside or outside of the strips and blocks.

In order to qualitatively determine the impacts of closures based on the findings of the GIS analysis, blocks which approximated the contour buffer strips were identified for closure in the Bering Sea bycatch simulation model. The results of the model runs indicated that most of the groundfish catch could be taken under buffer closures while maintaining savings in chinook bycatch. The reduction in net benefits to the nation were very small in comparison to the negative impacts seen in alternative scenarios from previous analyses. Of the runs made with buffer strip closures, the option with the least impact was closure of the buffer strip following attainment of a cap (e.g. 16,000 chinook in this case) during the months of January - April and September - December only.

Separation of the model runs into data from either 1990 or 1991 (rather than the average of the two years) did not allow bycatch rates in the model to increase to the extent that the higher caps (.012 or .024) could be fully evaluated. But the data from the higher bycatch levels in 1991 indicated that the bycatch cap of 24,000 chinook (based on the 0.012 chinook/mt annually) would still be constraining to the groundfish fisheries and lead to negative benefits in years with similar levels of bycatch.

Following the January 1993 presentation, the Council, based on SSC and AP recommendations, voted that the analysis should be released for public review following the addition of two sections to the EA/RIR. The first additional section was to estimate the impacts of trawl-caught chinook salmon on western Alaskan chinook salmon stocks. The second additional section addressed the value of bycaught chinook salmon to the recreational fisheries. The AP had also requested that a table be included which ranked statistical areas by bycatch level.

Fairly detailed information on returning chinook salmon was available for the Nushagak River, and some information was also available for the Yukon River chinook salmon returns. Combined with scale pattern analysis information from chinook salmon bycaught in Bering Sea trawl fisheries, this data was used to estimate the percent by which the returns to the Nushagak and the Yukon Rivers would have increased had bycatch not occurred. Percentage increases to the Nushagak River returns were estimated to have ranged between 2% and 7% and percentage increases to the Yukon River returns were estimated to have ranged between 1% and 4%.

Qualitative discussions of the value of chinook salmon to the commercial, recreational and subsistence fisheries were provided in the document which was submitted for public review as well.

II. Alternatives Considered in the Analysis

The various alternatives considered in the present analysis are as follows with alternative reference numbers corresponding to the sections in the text:

3.1.1. Alternative 1. Status Quo. No chinook PSC caps or time/area closures. Each of the four VIP assumptions is presented under Status Quo.

3.1.2. Alternative 2. Chinook Prohibited Species Caps. Chinook PSC caps in place, both with and without time/area closures.

3.1.2.1. Option 1. Close the entire BS/AI to a specific fishery upon attainment of the chinook PSC cap by that fishery, or group of fisheries.

3.1.2.2. Option 2. Close specific federal statistical areas to a specific fishery upon attainment of the chinook PSC cap by that fishery, or group of fisheries.

Area sub-options:

1) Close areas 511, 517 and 519 as one zone; Close all other areas as a second zone. Caps are apportioned to zones by historic bycatch values.

2) Close 5 independent zones:

- a) area 511
- b) areas 517 and 519
- c) area 540
- d) area 518
- e) all other areas.

Caps are apportioned to zones based on historic bycatch values.

Time closure sub-option:

Divide all closures listed above into 2 time periods: January-April; and May-December. The cap is evenly divided between the two time periods. The closed areas are reopened on May 1 for the remainder of the cap.

3.1.2.3. Option 3. Close areas which do not conform to federal statistical areas but which have been shown historically to have high chinook bycatch. Closures of these areas would be triggered by attainment of a chinook PSC cap in specific fisheries. Closed areas are reopened during May, June, July and August. The closures would apply to a buffer strip on either side of the 200 m contour, and to a few blocks in the vicinity of Unimak Island.

3.1.3. Alternative 3. Time and Area Closures - No Chinook PSC.

Close areas which do not conform to federal statistical areas but which have been shown to have high chinook bycatch during certain periods of the year. These areas are in proximity to the "horseshoe", Unimak Island, and the 200 m contour. The closure would be in effect during periods of high chinook bycatch, January - April and September - December.

III. Vessel Incentive Program

The Vessel Incentive Program (VIP) is currently in effect for halibut and red king crab. The Bering Sea bycatch simulation model mimics an effective VIP program by reducing high bycatch rates to acceptable program levels. In the April 1992 draft of Amendment 21, the status of the salmon VIP program was unknown, and various VIP assumptions were analyzed to cover the various outcomes of a salmon VIP decision. Salmon has since been dropped from the VIP program. The original VIP assumptions were retained in this analysis in order to conform with previous analyses, to allow for eventual inclusion of salmon into the VIP program, and in order to gauge the effects of an active avoidance of high bycatch rates by groundfish vessels.

Four VIP assumptions used throughout this analysis were as follows:

1. No VIP for any species. Within the model, all bycatch rates are included as observed in the 1990 and 1991 fisheries.
2. VIP in effect for halibut and red king crab. Within the model, the bycatch rates for these species which are greater than double the VIP approved rate are not included in calculations. Salmon is not included in the VIP program (all salmon bycatch rates included in the model).
3. VIP in effect for halibut and red king crab as above. Salmon bycatch rates which are greater than five times a previously accepted VIP rate are not included in the calculations (salmon bycatch rate standard is "relaxed").
4. VIP is in effect for halibut, red king crab and salmon. Within the model, the bycatch rates for these species which are greater than double the VIP approved rates are not included in calculations.

Assumption #2 most closely reflects current groundfish management.

IV. Summary of Findings

The Bering Sea bycatch simulation model was used to estimate the net benefits to the nation under the various alternatives. The data was from the 1990 and 1991 domestic fisheries in the Bering Sea, and model runs were made using the average of the two years and each of the two years separately. See attached table for a summary of the following discussion.

3.1.1. Alternative 1. Status Quo. No chinook PSC caps or time/area closures.

Runs of the Bering Sea bycatch simulation model under this alternative served as the baseline by which to compare the various alternatives. In general, net benefits to the nation tended to increase as the bycatch rates came into the bounds expected under an effective VIP program.

3.1.2. Alternative 2. Chinook Prohibited Species Caps.

Based on bycatch simulation model runs, the implementation of PSC caps for chinook salmon reduced the bycatch of chinook salmon to within the range of the caps.

However, the loss of groundfish due to chinook PSC closures resulted in sometimes very significant costs to the groundfish fisheries. Based on the rates encountered in 1990 and 1991, the chinook PSC caps resulted in the early closure of most fisheries. If chinook salmon bycatch rates are maintained within the levels originally suggested in the VIP program, fewer chinook are encountered, and the higher caps are not reached, and therefore there are no decreases in benefits due to closures. The model was unable to fully evaluate the effect of the higher PSC caps (24,000 and 48,000 chinook) because the number of chinook bycaught in 1990 was approximately 19,500 chinook, and in 1991 was approximately 30,900 chinook. The effects of a higher cap on net benefits during a year of extremely high chinook bycatch are unknown.

3.1.2.1. Option 1. Close the entire BS/AI upon attainment of the chinook PSC cap.

Generally the net benefits were lower when the entire Bering Sea was closed than when more well defined areas were closed. High decrease in net benefits from baseline cases.

3.1.2.2. Option 2. Close specific statistical areas upon attainment of the PSC cap.

Area Suboptions: Close 2 zones; and close 5 different zones:

Generally, the net benefits increased as the number of separately managed zones increased. Overall substantial decrease in net benefits from baseline cases.

Time closure sub-option: Divide all closures listed above into 2 time periods:

The separation of the chinook PSC cap into 2 specific time periods dramatically decreased the loss in net benefits due to chinook PSC cap closures. Fisheries which were halted early in the year due to high chinook bycatch were able to fish during periods of lower bycatch, and increase total groundfish catch. Division of the cap in this manner, however, did reduce the amount of PSC cap available in the first third of the year, and fisheries not affected by the higher cap levels (e.g. 24,000) were halted by the PSC cap in the first third of the year because the overall cap available for January - April was cut in half.

3.1.2.3. Option 3. Close areas which do not conform to federal statistical areas but which have been shown historically to have high chinook bycatch:

Analysis of historical data showed that the majority of chinook salmon are bycaught during the months of January-April and September-December. Chinook salmon are primarily bycaught in the region of

the "horseshoe", in the vicinity of Unimak Island, and along the 200 m contour, especially within 15 miles of the contour.

In order to use the bycatch simulation model which has blocks as the finest scale of resolution, blocks which roughly conform to the 200 m contour buffer strip and the two blocks above Unimak Island were closed upon chinook PSC cap attainment. Since fisheries were still prosecuted outside of this area, and within this area during the months of May - August, the closure of this area when a cap of 8,000 chinook was reached resulted an estimated chinook bycatch of approximately 14,000 chinook. The decrease in net benefits under an 8,000 chinook trigger was approximately \$7.2 million dollars which was substantially less than the decreases from statistical area closures (\$60 - \$400 million). The 16,000 chinook cap resulted in an estimated chinook bycatch of approximately 17,000 chinook, and an estimated increase in benefits of \$1.0 million dollars. It should be noted that because the total number of chinook salmon generated by the model under the baseline used for comparison was only 18,000, the effects of this cap and closure may not be fully accurate.

3.1.3. Alternative 3. Time and Area Closures - No Chinook PSC.

In order to use the bycatch simulation model which has blocks as the finest scale of resolution, two areas approximating the geographical areas described above were defined as follows:

1) The three blocks in the "horseshoe", and two blocks above Unimak Island were closed for the bycatch simulation during January-April and September-December. The simulation resulted in a reduction in chinook salmon bycatch of only 800 fish. This is because although the rates in these blocks were high, there were also high rates in other portions of, for instance, area 517 along the 200 m contour.

2) The blocks which roughly conform to the 200 m contour buffer strip and the two blocks above Unimak Island were closed for the bycatch simulation during January-April and September-December. Under this simulation, a total of 8,180 chinook were caught outside of this area, and during this area in the summer months. The estimated groundfish catch did not vary greatly from the baseline data, however, because of slightly higher halibut and crab bycatch, and because of the changes in value of the catch during the year, the closure resulted in a net decrement in benefits of approximately \$20.6 million.

Executive Summary - Amendment 21b Alternatives. Chinook salmon not included in the VIP program.

Alternative	Chinook Bycatch Cap	Closure	Time/Area	BASELINE (X 1,000)	Net Benefits (X 1,000)	Net Benefits minus BASELINE (X 1,000)	Number of Chinook	Total Catch (X 1,000)
3.1.1. Baseline	None	None	None	\$482,353	\$482,353	\$0	20,768	1,756
3.1.2.1.	8,000	Entire BSAI	Area only	\$482,353	\$95,921	(\$386,432)	8,718	290
3.1.2.1.	16,000	Entire BSAI	Area only	\$482,353	\$174,877	(\$307,476)	16,281	528
3.1.2.1.	24,000	Entire BSAI	Area only	\$482,353	\$482,353	\$0	20,768	1,756
3.1.2.1.	48,000	Entire BSAI	Area only	\$482,353	\$482,353	\$0	20,768	1,756
3.1.2.2.(1)	8,000	2 Zones	Area only	\$482,353	\$117,406	(\$364,947)	10,651	373
3.1.2.2.(1)	16,000	2 Zones	Area only	\$482,353	\$178,472	(\$303,881)	17,972	570
3.1.2.2.(1)	24,000	2 Zones	Area only	\$482,353	\$482,402	\$49	20,768	1,756
3.1.2.2.(1)	48,000	2 Zones	Area only	\$482,353	\$482,402	\$49	20,768	1,756
3.1.2.2.(2)	8,000	5 Zones	Area only	\$482,353	\$144,052	(\$338,301)	10,967	473
3.1.2.2.(2)	16,000	5 Zones	Area only	\$482,353	\$208,087	(\$274,266)	18,131	687
3.1.2.2.(2)	24,000	5 Zones	Area only	\$482,353	\$482,374	\$21	20,769	1,756
3.1.2.2.(2)	48,000	5 Zones	Area only	\$482,353	\$482,402	\$49	20,768	1,756
3.1.2.2.(TIME)	8,000	Entire BSAI	Time and Area	\$482,353	\$347,584	(\$134,769)	7,704	1,292
3.1.2.2.(TIME)	16,000	Entire BSAI	Time and Area	\$482,353	\$372,201	(\$110,152)	11,963	1,412
3.1.2.2.(TIME)	24,000	Entire BSAI	Time and Area	\$482,353	\$405,224	(\$77,129)	15,864	1,527
3.1.2.2.(TIME)	48,000	Entire BSAI	Time and Area	\$482,353	\$482,353	\$0	20,768	1,756
3.1.2.2.(TIME)	8,000	2 Zones	Time and Area	\$482,353	\$351,443	(\$130,910)	7,960	1,332
3.1.2.2.(TIME)	16,000	2 Zones	Time and Area	\$482,353	\$395,002	(\$87,351)	14,298	1,475
3.1.2.2.(TIME)	24,000	2 Zones	Time and Area	\$482,353	\$414,599	(\$67,754)	18,061	1,550
3.1.2.2.(TIME)	48,000	2 Zones	Time and Area	\$482,353	\$482,402	\$49	20,768	1,756
3.1.2.2.(TIME)	8,000	5 Zones	Time and Area	\$482,353	\$369,393	(\$112,960)	8,511	1,266
3.1.2.2.(TIME)	16,000	5 Zones	Time and Area	\$482,353	\$414,092	(\$68,261)	14,306	1,513
3.1.2.2.(TIME)	24,000	5 Zones	Time and Area	\$482,353	\$444,870	(\$37,483)	18,426	1,626
3.1.2.2.(TIME)	48,000	5 Zones	Time and Area	\$482,353	\$482,402	\$49	20,768	1,756
3.1.2.3. Baseline	None	None	None	\$500,234	\$500,234	\$0	18,074	1,752
3.1.2.3.	8,000	Contour/Unimak	Time and Area	\$500,234	\$493,065	(\$7,169)	14,043	1,751
3.1.2.3.	16,000	Contour/Unimak	Time and Area	\$500,234	\$501,273	\$1,039	17,175	1,751
3.1.2.3.	24,000	Contour/Unimak	Time and Area	\$500,234	\$500,234	\$0	18,074	1,752
3.1.2.3.	48,000	Contour/Unimak	Time and Area	\$500,234	\$500,234	\$0	18,074	1,752
3.1.3.	None	Horseshoe/Unimak	Time and Area	\$487,880	\$491,856	\$3,976	19,509	1,751
3.1.3.	None	Contour/Unimak	Time and Area	\$500,234	\$479,607	(\$20,627)	8,180	1,739

Notes: The baseline runs are with no chinook cap in place. All runs above are with the VIP program as currently defined: chinook salmon included.

2 zones are defined as follows: 1) Areas 511, 517 and 519; 2) all other areas.

5 zones are defined as follows: 1) Area 511; 2) Areas 517 and 519; 3) Area 540; 4) Area 518; 5) All other areas.

Time closures under 3.1.2.2. are January-April and May-December. Fisheries closed during the first period may reopen during the second period.

Time closures under 3.1.2.3. and 3.1.3. are January-April and September-December. There is no closure for the period May-August.

Figure 2-47. Federal statistical reporting areas in the Bering Sea.
The 200 m contour indicated in bold.

Bering Sea Statistical Areas

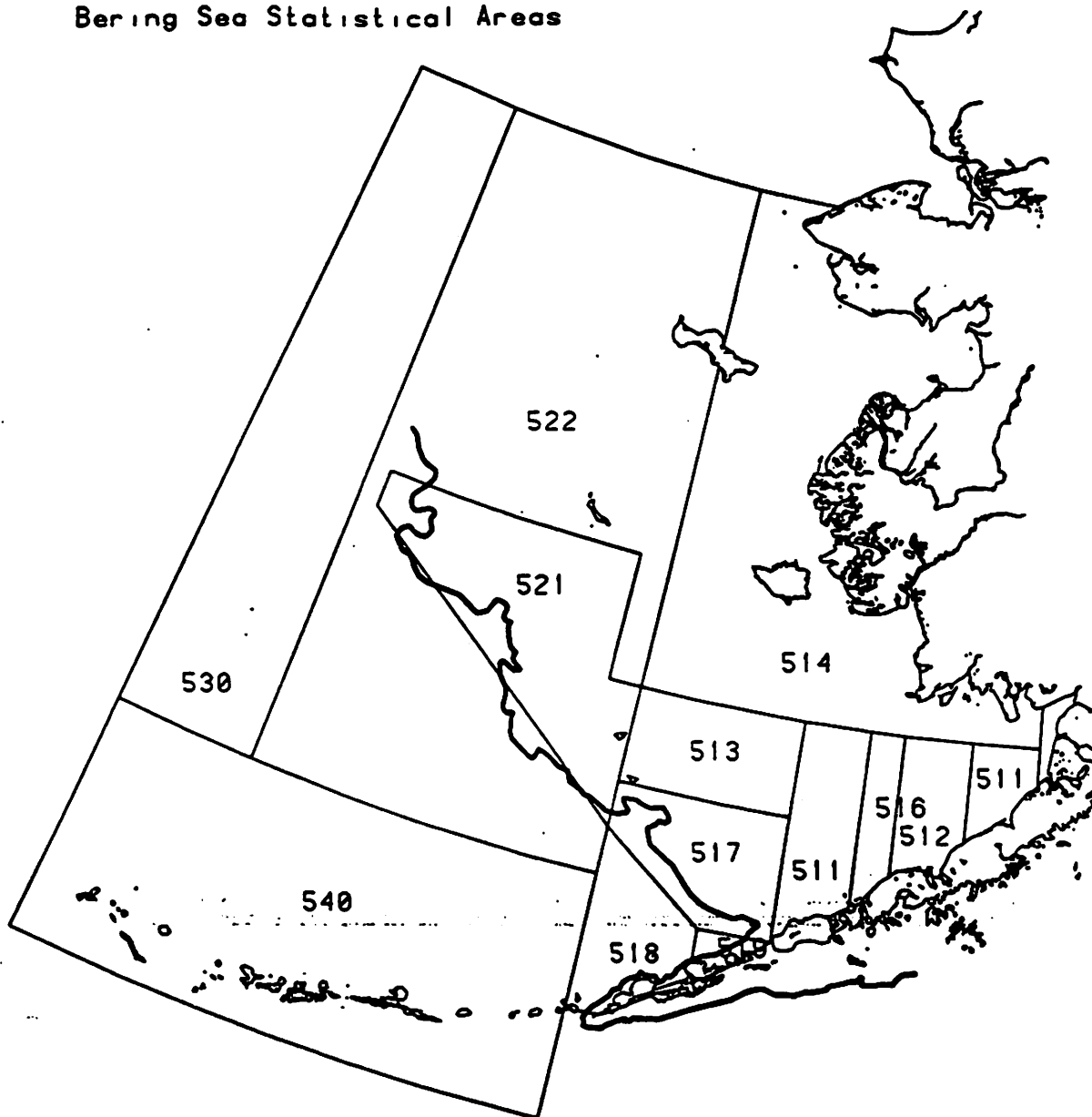


Figure 2-49. Close-up of the Alaskan Peninsula and Aleutian Islands including Unimak Island. The 200 m contour is indicated with a buffer extending for 15 miles on each side. Each block is 1/2° latitude by 1° longitude (30 miles square). The three blocks in the horseshoe are indicated, as is the corner block of the horseshoe and the two blocks north of Unimak Is.

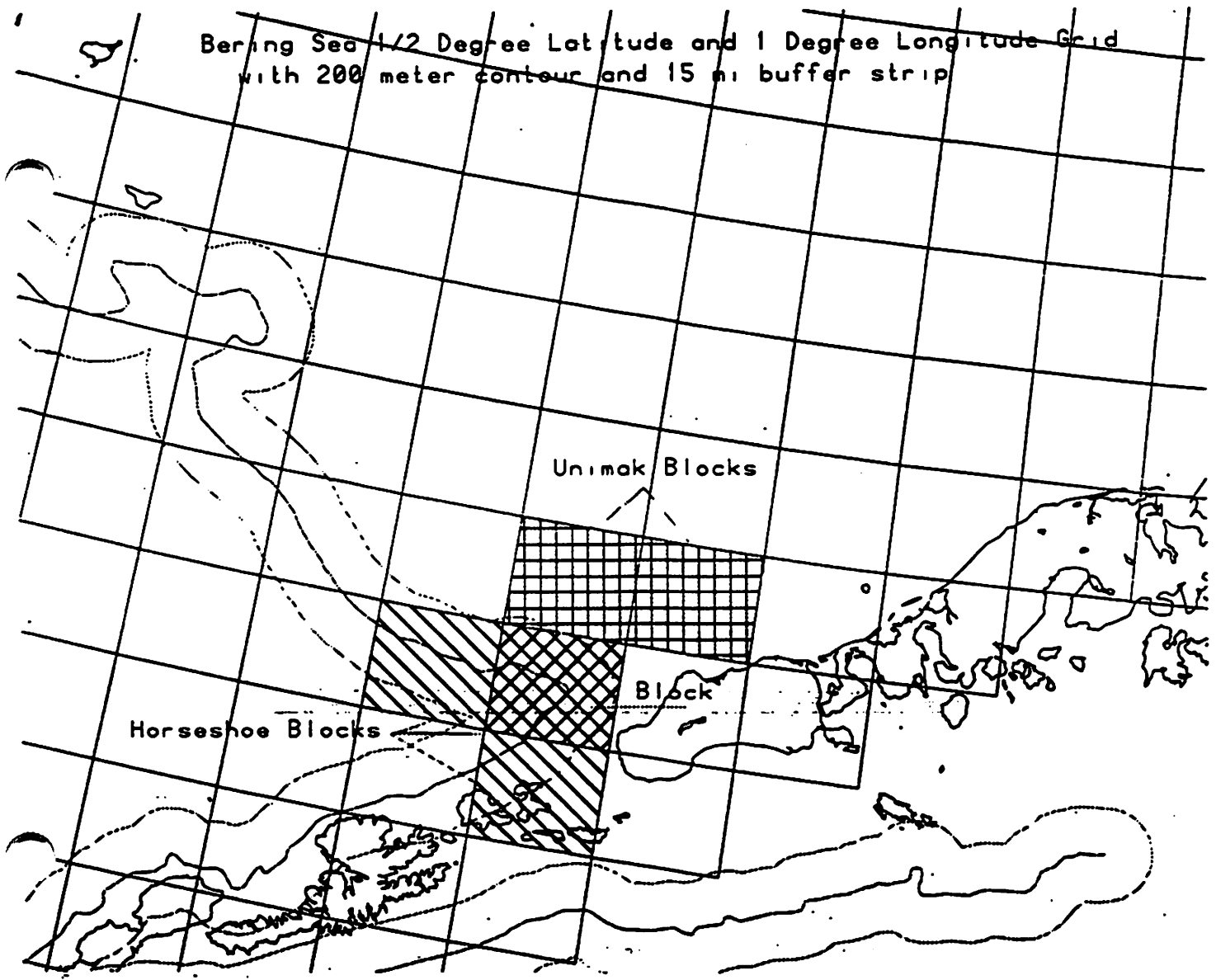
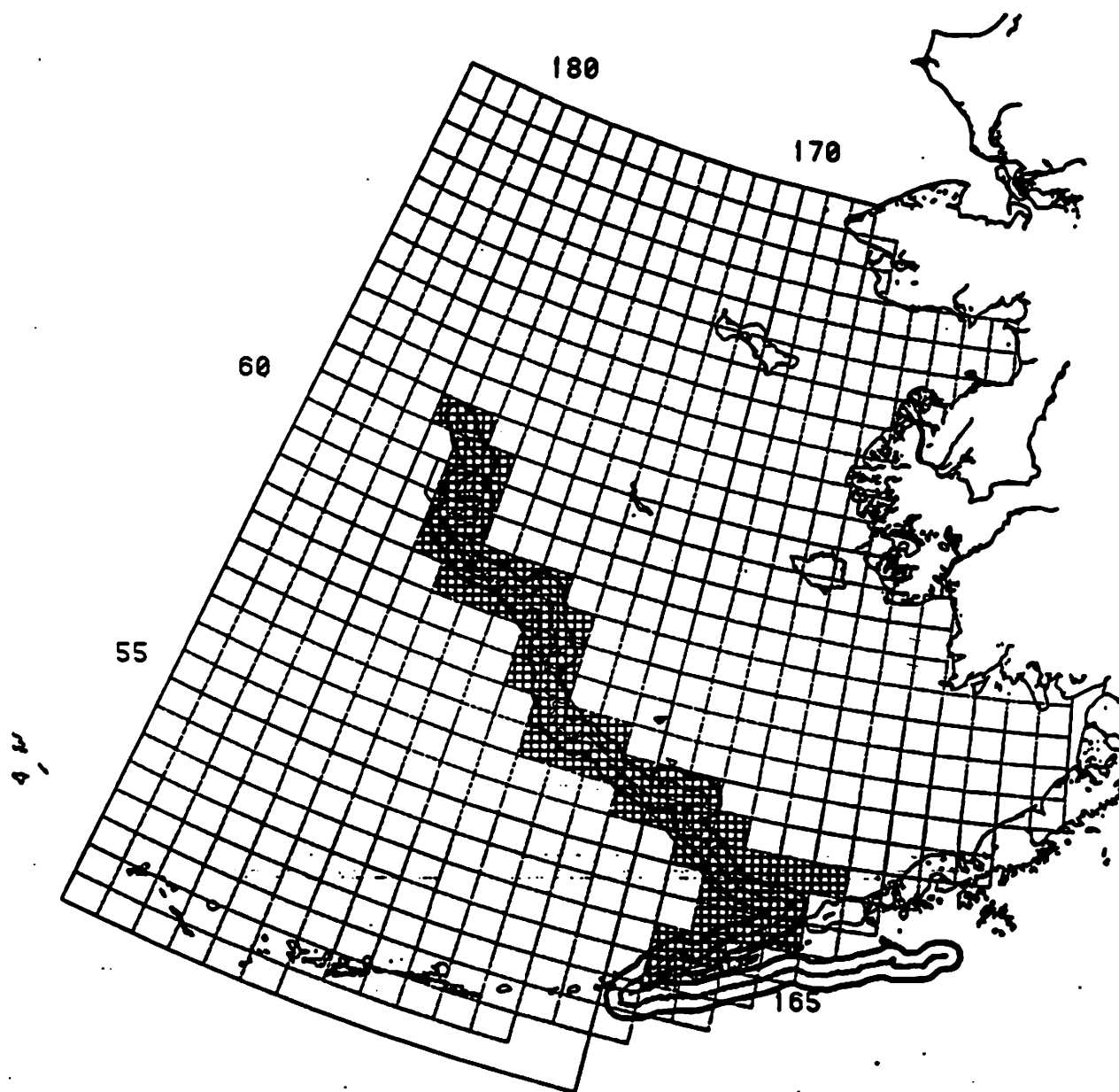


Figure 2-156. Location of blocks selected as approximating the spatial pattern of the 200 m contour. The 2 Unimak blocks were selected as well.



STATE OF ALASKA

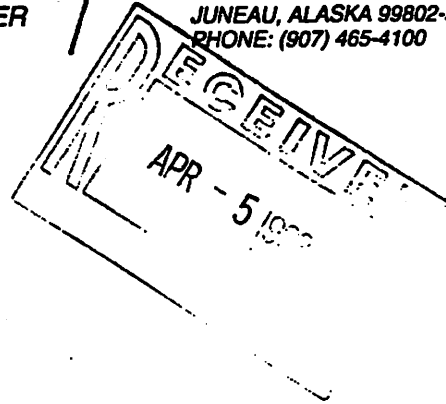
DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

AGENDA D-2(e)(2)
APRIL 1993

WALTER J. HICKEL, GOVERNOR

P.O. BOX 25526
JUNEAU, ALASKA 99802-5526
PHONE: (907) 465-4100



April 2, 1993

Richard B. Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

Dear Chairman Lauber:

It is my understanding the council will be taking final action on Amendment 21B, Salmon Bycatch Management, at its April meeting. Due to the importance of salmon to the sport, commercial, and subsistence fisheries in Alaska, and because the Alaska Department of Fish and Game has primary responsibility for management of salmon in Alaska's waters, bycatch of these species inside and outside state jurisdiction has always been a concern to the state. Based on this concern, I would like to make the following recommendation in order that the council may focus on the issue of bycatch stabilization, rather than fear of bycatch-induced closures of the groundfish fishery.

I urge the council to pass Amendment 21B. There is a substantial need to protect all salmon species, especially chinook. All of these species are fully allocated, and in a few cases, conservation concerns exist. For these reasons, I believe it is imperative that the council act to address the salmon bycatch issue.

Adoption of an alternative which caps interceptions at existing levels, approximately 36,000 fish in recent years, will prevent further expansions of chinook bycatch, but will not overly restrict the Bering Sea/Aleutian Island groundfish fisheries. The salmon bycatch analysis provides adequate information on where and when to institute closures if the cap were ever reached. As long as conservation concerns are addressed, this seems a prudent starting point. The 1989-1991 average interception rate of Yukon River and Bristol Bay chinook salmon stocks in the Bering Sea groundfish fishery was 1.5 percent and 4.7 percent, respectively. Even this level of bycatch greatly concerns western Alaskan salmon fishermen, but the lack of any constraints on interception is even more disconcerting.

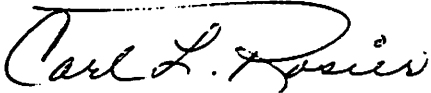
Mr. Richard B. Lauber

-2-

April 2, 1993

I consider implementation of the salmon bycatch amendment to be an important matter. Your consideration of this issue and my proposal is appreciated.

Sincerely,

A handwritten signature in cursive script that reads "Carl L. Rosier". The signature is written in dark ink and is positioned above the typed name.

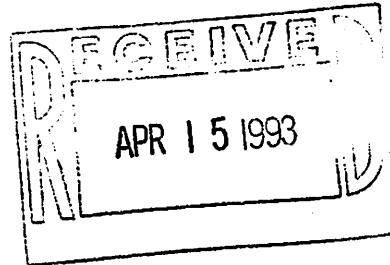
Carl L. Rosier
Commissioner



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

April 15, 1993

Mr. Richard B. Lauber
Chairman, North Pacific Fishery
Management Council
P.O. Box 103136
Anchorage, Alaska 99510



Dear Rick,

The North Pacific Fishery Management Council (Council) is scheduled to taken final action on Amendment 21b to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area (BSAI) at its April 1993 meeting. This amendment would establish the authority to implement chinook salmon bycatch management measures for the BSAI trawl fisheries. During its January 1993 meeting, the Council requested that an analysis of alternatives for a salmon vessel incentive program (VIP) be developed for Council consideration that could potentially complement chinook salmon bycatch management measures the Council may recommend under Amendment 21b.

A draft analysis on alternatives for a salmon VIP is enclosed for Council review. Unfortunately, the Council has yet to clearly identify the salmon bycatch problem it is attempting to address, or its objectives for salmon bycatch management measures. Lack of a definitive problem statement confounds the analyses of appropriate management alternatives and unnecessarily complicates the Council process. Additional confusion exists on the Council's intent for a salmon VIP, and how such a program would interface with other salmon bycatch management measures under Council consideration.

During its April 1993 meeting, we recommend that the Council clearly define its objectives for salmon bycatch management measures. We also recommend that Council consideration of a salmon VIP be included as part of Amendment 21b to allow a comprehensive consideration of alternatives for salmon bycatch management measures.

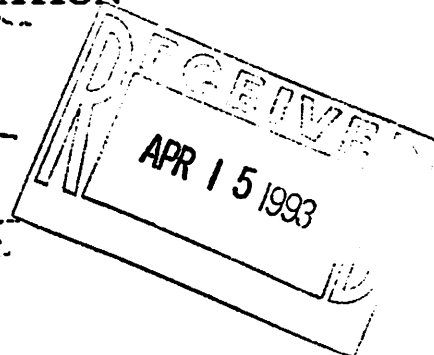
Sincerely,

Steven Pennoyer
Director, Alaska Region

Enclosure

NOTE: Draft analysis will be available by meeting time.



BRISTOL BAY NATIVE ASSOCIATIONP.O. BOX 310
DILLINGHAM ALASKA 99576
PHONE (907) 842-6257

April 15, 1993

North Pacific Fishery Management Council
Richard B. Lauber, Chairman
P.O. Box 103136
Anchorage, Alaska 99510

Dear Mr. Lauber,

The Bristol Bay Native Association (BBNA) is comprised of 30 communities within the Bristol Bay Region and represents 4600 Native people residing in those communities. BBNA would like to make the following comments on AMENDMENT 21 b (Salmon Bycatch Management).

First off, the draft prepared by ADF&G, ACFEC and NPFMC staff was informative and well organized. However, BBNA feels the overall picture of salmon bycatch cannot be truly understood on a computer model, but rather by good onboard observer coverage.

The draft report on chinook bycatch only deals with the Nushagak and Togiak River systems. The Bristol Bay Region have other river systems where chinook conservation problems exist.

The Egegik River, a major tributary is the King Salmon River. The chinook of the King Salmon River are at an all time low. Early season fishing for sockeye salmon has been limited each season since 1989, in order to provide an extra measure of escapement protection to chinook salmon. Sport fishing has also been severely curtailed or eliminated altogether.

In the Naknek River, ADF&G staff and the Alaska Board of Fish have instituted a series of regulatory changes to the commercial and sport fisheries of that district. All of these regulatory changes have been because of concerns with the conservation of chinook stocks of this river system.

The Nushagak River, which is by far the largest producer of chinook salmon in Bristol Bay, is in a rebuilding mode. Chinook salmon returns to the Nushagak drainage peaked in the early 1980's and since then have declined sharply. This sharp rate of decline has set off the alarm bells at ADF&G, as well as with the various user groups who depend on this resource. One of the major reasons for the rapid decline in abundance was attributed to high seas fishing. Through out the 1980's, faced with declining returns, ADF&G placed restrictive regulation on the inshore fisheries. This caused a lot

of hard ship on those fishermen who depend on this valuable resource. In 1991 the Alaska Board of Fish adopted a Nushagak River Chinook Management Plan to help rebuild the stocks.

In the Togiak District the chinook runs throughout the District have declined steadily since the mid-1980's, and there is no evidence that this trend will change in 1993. Escapement into the Togiak River has not reached the goal of 10,000 chinook since 1985. Emergency orders have been issued to curtail the commercial and sport fisheries and returns are still not improving.

The overall Bristol Bay Subsistence harvest has remained steady throughout the last ten years. Chinook salmon are the most important species of salmon for Subsistence use.

The overall abundance and outlook for chinook salmon in Bristol Bay for 1993 is reflective of the 1980's downturn. ADF&G management biologists will again approach the season cautiously, and place additional restrictions on the commercial, sport and subsistence fishermen of Bristol Bay. According to the document produced by your staff, the impact of trawl bycatch of chinook salmon on Western Alaskan stocks is unknown, even though these chinooks stocks are predominantly of Western Alaska origin.

Chinook salmon are a fully utilized species in Bristol Bay and any chinook cap or quota imposed upon the trawl fisheries is a reallocation from the inshore fishermen to the offshore trawl fleet. BBNA strongly feels that if a chinook cap is implemented on the trawl fisheries then that cap should not be based on the years of 1990 to 1992 when bycatch levels of chinook salmon were at an all-time high.

We know that 515, 517, 518 and 519 are the "hot spot areas". These areas lie in the vicinity of the 200 mile contour of the shelf break and extends roughly northwest from Unimak Island, the "horseshoe" and the Alaska Peninsula and Aleutian Islands. The council needs to address these areas and implement closures to afford the chinook a window of opportunity to pass through and keep the trawl bycatch of chinook salmon to a minimal.

Sincerely Yours,

BRISTOL BAY NATIVE ASSOCIATION


Terry Heofferle,
Executive Director

North Pacific Fishery Management Council

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MEMORANDUM

TO: Clarence Pautzke, Executive Director
FROM: ^{BCP} Brent Paine, Council Staff
DATE: March 9, 1993
SUBJECT: Request for Chinook Salmon Bycatch Data

In response to Dr. Pereyra's request for Chinook salmon bycatch in other Alaska fisheries, attached are three items. The first table summarizes Chinook salmon bycatch data in the Gulf of Alaska trawl fisheries for 1990, 1991 and 1992. I was unable to obtain this information for 1989, as the domestic observer program was not fully functioning during that year. The second item is a set of tables providing Chinook salmon catches by gear type for state managed salmon net fisheries. The third item provides information on Chinook catches (both target catch and estimated incidental mortalities) for the Southeast Alaska salmon fisheries. Included in this item is a memo from Mel Seibel, ADF&G, explaining the methods used to estimate encounter rates of Chinook salmon in the SE Alaska fisheries. Also attached is Dr. Pereyra's request. I hope this information proves useful in the Council's deliberations on the BSAI Chinook salmon bycatch issue.

Chinook Salmon Bycatch in the Gulf of Alaska Trawl Fisheries for 1990, 1991 and 1992

Key	Groundfish Targets	Numbers of Fish		
		1990	1991	1992
B	Pollock	118	2,340	2,159
C	Pacific Cod	4,038	4,749	5,304
D	Deep Water Flatfish	5,754	3,058	2,393
H	Shallow Water Flatfish		55	113
K	Rockfish	1,987	22,590	2,119
O	'Other'	n/a	42	77
P	Pollock - Pelagic Trawl	2,730	4,703	3,535
S	Sablefish	204	0	0
Total:		14,831	37,537	15,700

Data based on National Marine Fisheries Service, Alaska Region's Computer Bulletin Board Service.
 Note: For 1990, Deep Water Flatfish and Shallow Water Flatfish were combined.

Chinook salmon catch by gear type based on fish ticket records. ADFG March, 1993.

1989

Year	Management Area	Gear	Number Chinook	Weight Chinook	Average Weight	Number Permits	Number Landings
89	Prince Wm Snd	Purse Seine	718	11237	15.65	118	230
		Drift Gillnet	31288	829589	26.51	466	4811
		TOTAL	32006	840826		584	5041
89	Cook Inlet	Purse Seine	612	6908	11.28	40	153
		Set Gillnet	28030	662804	23.64	591	5525
		TOTAL	28642	669712		631	5678
89	Kodiak	Set Gillnet	106	2037	19.21	35	86
		TOTAL	106	2037		35	86
89	Chignik	Purse Seine	3542	76698	21.65	90	710
		TOTAL	3542	76698		90	710
89	Ak Peninsula	Purse Seine	5792	107967	18.64	91	746
		Drift Gillnet	7818	140080	17.91	181	1251
		Set Gillnet	4341	73842	17.01	95	715
		TOTAL	17951	321889		367	2712

Chinook salmon catch by gear type based on fish ticket records. ADFG March, 1993.

1990

Year	Management Area	Gear	Number Chinook	Weight Chinook	Average Weight	Number Permits	Number Landings
90	Prince Wm Snd	Purse Seine	117	1457	12.45	61	78
		Drift Gillnet	21988	567759	25.82	509	4284
		Set Gillnet	56	723	12.91	22	47
		TOTAL	22161	569939		592	4409
90	Cook Inlet	Purse Seine	199	2607	13.1	34	101
		Drift Gillnet	621	9798	15.77	289	525
		Set Gillnet	16845	373064	22.14	550	3111
		TOTAL	17665	385469		873	3737
90	Kodiak	Purse Seine	17550	213904	12.18	336	3374
		Beach Seine	38	644	16.94	11	27
		Set Gillnet	1218	14768	12.12	130	605
		TOTAL	18806	229316		477	4006
90	Chignik	Purse Seine	9901	134265	13.56	101	1538
		TOTAL	9901	134265		101	1538
90	Ak Peninsula	Purse Seine	11674	189017	16.19	107	1243
		Drift Gillnet	12695	200824	15.81	180	1433
		Set Gillnet	4450	77894	17.5	95	722
		TOTAL	28819	467735		382	3398

Note that chinook salmon catch in western Alaska fisheries is presented in the draft EA/RIR Amendment 21b. Southeast catch is provided in another table.

Chinook salmon catch by gear type based on fish ticket records. ADFG March, 1993.

1991

Year	Management Area	Gear	Number Chinook	Weight Chinook	Average Weight	Number Permits	Number Landings
91	Prince Wm Snd	Purse Seine	156	1732	11.1	58	86
		Drift Gillnet	35122	796379	22.67	508	4635
		Set Gillnet	76	1156	15.21	26	62
		TOTAL	35354	799267		592	4783
91	Cook Inlet	Purse Seine	576	3846	6.67	50	180
		Drift Gillnet	249	4154	16.68	159	214
		Set Gillnet	14141	300131	21.22	538	2870
		TOTAL	14966	308131		747	3264
91	Kodiak	Purse Seine	20980	254598	12.13	335	3421
		Beach Seine	29	378	13.03	6	16
		Set Gillnet	1225	14935	12.19	126	698
		TOTAL	22234	269911		467	4135
91	Chignik	Purse Seine	3285	69649	21.2	96	718
		TOTAL	3285	69649		96	718
91	Ak Peninsula	Purse Seine	5208	85835	16.48	107	909
		Drift Gillnet	7730	131675	17.03	178	1149
		Set Gillnet	3942	60052	15.23	95	794
		TOTAL	16880	277562		380	2852

Chinook salmon catch by gear type based on fish ticket records. ADFG March, 1993.

1992

Year	Management Area	Gear	Number Chinook	Weight Chinook	Average Weight	Number Permits	Number Landings
92	Prince Wm Snd	Purse Seine	966	17136	17.73	26	34
		Drift Gillnet	40239	1004290	24.95	518	4031
		Set Gillnet	101	1273	12.6	24	53
		TOTAL	41306	1022699		568	4118
92	Cook Inlet	Purse Seine	603	5932	9.83	42	155
		Drift Gillnet	618	9750	15.77	263	504
		Set Gillnet	18967	439413	23.16	561	5242
		TOTAL	20188	455095		866	5901
92	Kodiak	Purse Seine	20654	301531	14.59	323	3247
		Beach Seine	201	3887	19.33	6	33
		Set Gillnet	3444	42399	12.31	132	1321
		TOTAL	24299	347817		461	4601
92	Chignik	Purse Seine	10830	138082	12.74	101	1283
		TOTAL	10830	138082		101	1283
92	Ak Peninsula	Purse Seine	6745	104928	15.55	108	951
		Drift Gillnet	10712	182788	17.06	184	1771
		Set Gillnet	3620	63518	17.54	105	749
		TOTAL	21077	351234		397	3471

Note that chinook salmon catch in western Alaska fisheries is presented in the draft EA/RIR Amendment 21b. Southeast catch is provided in another table.

ESTIMATES OF S.E. ALASKA CHINOOK INCIDENTAL MORTALITIES FROM THE
FEBRUARY 13, 1993 CALIBRATION (97Z26) OF THE PSC CHINOOK MODEL

Southeast Alaska Chinook Salmon Mortalities

Total Incident Mortalities from
Regular Chinook Fishery and
Chinook Non-retention Period

YEAR	TROLL	NET	SPORT
1979	65712	1353	7803
1980	64670	1341	7729
1981	76623	1331	8638
1982	136617	2037	11875
1983	140746	2906	12677
1984	175959	1652	12108
1985	127140	4995	10482
1986	120016	26251	9565
1987	150887	13907	5677
1988	79975	21848	5010
1989	130608	22123	7766
1990	130457	22087	13383
1991	146897	26059	11022
1992	158199	8134	16132

Sublegal Shaker Mortalities
Regular Chinook Fishery

YEAR	TROLL	NET	SPORT
1979	65712	1353	7803
1980	64670	1341	7729
1981	67772	1331	8638
1982	85571	2037	11875
1983	96034	2906	12677
1984	103091	1652	12108
1985	62996	1840	10482
1986	73064	3625	9565
1987	60073	3975	5677
1988	42616	2576	5010
1989	53507	3212	7766
1990	65962	2970	13383
1991	54362	4091	11022
1992	40339	3170	16132

Legal Mortalities
Chinook Non-retention Period

YEAR	TROLL	NET	SPORT
1979	0	0	0
1980	0	0	0
1981	4383	0	0
1982	25278	0	0
1983	22141	0	0
1984	34064	0	0
1985	30422	7316	0
1986	20144	7671	0
1987	48008	2449	0
1988	14963	4474	0
1989	37033	4590	0
1990	29099	4424	0
1991	42408	5126	0
1992	54014	2998	0

Sublegal Mortalities
Chinook Non-retention Period

YEAR	TROLL	NET	SPORT
1979	0	0	0
1980	0	0	0
1981	4468	0	0
1982	25769	0	0
1983	22571	0	0
1984	36784	0	0
1985	33722	35839	0
1986	24808	14955	0
1987	42806	7583	0
1988	23396	14798	0
1989	40063	14521	0
1990	34396	14733	0
1991	50127	16842	0
1992	63846	19665	0

ESTIMATES OF S.E. ALASKA CHINOOK CATCHES FROM THE
FEBRUARY 13, 1993 CALIBRATION (97Z26) OF THE PSC CHINOOK MODEL

Model Estimates of Chinook Catch
(Estimates based on actual catch)

YEAR	TROLL	NET	SPORT
1979	204841	16099	10545
1980	202875	15900	10869
1981	198815	14870	10096
1982	228854	19419	11036
1983	266949	31328	13757
1984	325999	18356	15779
1985	186186	23693	12270
1986	201191	13615	10028
1987	201997	9319	10617
1988	189335	11916	10797
1989	193306	11693	14591
1990	230375	11862	21034
1991	201832	13561	24604
1992	142591	15801	20520

ESTIMATES OF COASTWIDE CHINOOK CATCHES AND INCIDENTAL MORTALITIES
FROM THE FEBRUARY 13, 1993 CALIBRATION (97Z26) OF THE PSC CHINOOK MODEL

All fisheries north of Cape Falcon.

CATCHES

YEAR	ALASKA	CANADA	SOUTHERN U.S.*
1979	233485	163376	832806
1980	229164	1561789	808212
1981	223781	1478992	794250
1982	259309	1470357	823847
1983	312034	1414090	651903
1984	360134	1533948	615191
1985	221149	1072582	728617
1986	224834	1035365	646590
1987	221933	970916	1068423
1988	212048	969285	1101101
1989	219590	868143	803017
1990	243271	856749	730851
1991	239997	864740	600992
1992	178712	957761	637253

TOTAL INCIDENTAL MORTALITIES

YEAR	ALASKA	CANADA	SOUTHERN U.S.*
1979	74868	27014	146894
1980	73740	218705	145707
1981	66792	227498	147553
1982	150329	300241	145287
1983	150329	283016	97153
1984	187729	335965	60546
1985	182817	198011	64562
1986	155832	212332	121455
1987	170471	289210	94202
1988	106533	299259	119836
1989	150487	245928	67316
1990	15927	208146	90918
1991	183978	323455	75907
1992	182465	381849	99798

* SOUTHERN U.S. FISHERIES NORTH OF CAPE FALCON

DRAFT FOR COUNCIL REVIEW

**ENVIRONMENTAL ASSESSMENT
and
REGULATORY IMPACT REVIEW/INITIAL REGULATORY FLEXIBILITY ANALYSIS**

**FOR A FISHERY MANAGEMENT PLAN AMENDMENT TO IMPLEMENT
A VESSEL INCENTIVE PROGRAM TO REDUCE SALMON BYCATCH RATES
IN THE BERING SEA AND ALEUTIANS ISLANDS AREA TRAWL FISHERIES**

prepared by

**National Marine Fisheries Service
Juneau Alaska**

April 15, 1993

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DRAFT

ENVIRONMENTAL ASSESSMENT/REGULATORY IMPACT REVIEW/
INITIAL REGULATORY FLEXIBILITY ANALYSIS
FOR AN AMENDMENT TO THE FISHERY MANAGEMENT PLAN
FOR THE GROUND FISH FISHERY
OF THE BERING SEA AND ALEUTIAN ISLANDS AREA

(Analysis of a Salmon Vessel Incentive Program)

1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone of the Bering Sea Aleutian Island Area (BSAI) are managed under the Fishery Management Plan (FMP) for the Groundfish Fishery of the BSAI. The FMP was developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery Conservation and Management Act (Magnuson Act) and become effective in 1982.

At times, amendments to the FMPs or their implementing regulations are necessary to resolve problems pertaining to management of the groundfish fisheries. The structure of the FMP allows certain measures to be changed by regulatory amendments without amending the FMP itself. Actions taken to amend the FMP or its implementing regulations must meet the requirements of Federal laws and regulations. Among the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12291, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12291, and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Section 1 of this document. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals also are addressed in this section. Section 3 contains a Regulatory Impact Review (RIR) which addresses the requirements of both E.O. 12291 and the RFA that economic impacts of the alternatives be considered. Section 4 contains the Initial Regulatory Flexibility Analysis (IRFA) required by the RFA which specifically addresses the impacts of the proposed action on small businesses.

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses a proposed FMP amendment that would establish a vessel incentive program (VIP) to reduce salmon bycatch rates in the BSAI trawl

fisheries. Existing FMP authority under section 14.4.2.4 authorizes the establishment of a VIP by regulatory amendment to reduce bycatch rates of prohibited species for which prohibited species catch (PSC) limits are established under section 14.4.2.2 of the FMP. At this time, no PSC limits for salmon are established. Therefore, the establishment of a salmon VIP would require an FMP amendment.

1.1 Description of the problem and need for action

The BSAI groundfish fisheries result in incidental fishing mortality of Pacific salmon. These fisheries primarily are prosecuted using trawl, pots, and hook-and-line gear. Trawl gear operations account for most of the groundfish catch, harvesting 95 percent and 93 percent of the BSAI groundfish catch during 1991 and 1992, respectively. Tables 1 and 2 summarize bycatch amounts of chinook salmon and other salmon species combined¹ associated with the 1991 and 1992 BSAI groundfish fisheries. Trawl fisheries typically account for more than 99 percent of the salmon bycatch in the groundfish fisheries. Chinook salmon dominate the bycatch and generally is the species of greatest interest and concern. Information relative to the bycatch of chinook salmon, therefore, is readily available in more detail than that for other salmon species. Chum salmon dominate the other salmon species taken as bycatch.

The salmon discard mortality rate experienced in the groundfish fisheries is assumed to be 100 percent. The incidental salmon fishing mortality experienced in the groundfish fisheries is one of several competing uses of the fully utilized salmon resource. Salmon also are used as catch and bycatch in directed commercial, subsistence, and sport salmon fisheries and as bycatch in other non-salmon and non-groundfish fisheries. Salmon used as bycatch in the groundfish fisheries and in other fisheries can exacerbate the management problem associated with the allocation of salmon among escapement goals set by Alaska State management policy and the terminal salmon fisheries. The groundfish fisheries may result in reduced escapement or harvest in the salmon fisheries, thereby imposing a cost on other salmon users.

Management problems associated with salmon bycatch have been exacerbated because recent management actions are expected to increase salmon bycatch in the BSAI pollock fishery. These actions include (1) Amendment 18 to the FMP that authorizes

¹ Estimates of groundfish catch are based on blended data from the NMFS observer program and industry reported catch. Estimates of salmon bycatch amounts are based on estimated groundfish catch and observer data on salmon bycatch rates from sampled catch.

Table 1. 1991 groundfish catch in the BSAI groundfish fisheries (metric tons) and associated bycatch of chinook salmon and other salmon (numbers of fish), based on NMFS blend estimates of groundfish catch and observed salmon bycatch rates.

BSAI TARGET FISHERY	GROUNDFISH	CHINOOK SAL	OTHER SAL
Trawl Fisheries			
Atka Mackerel	30,459	152	20
Bottom pollock	381,142	5,596	11,253
Pacific cod	154,879	7,410	66
Flatfish	158,864	585	1,114
Rockfish	10,069	816	7
Other species	76	2	1
Midwater pollock	1,223,995	27,782	22,123
Rocksole	79,715	869	1,040
Sablefish	551	1	1
Greenland turbot	8,196	39	8
Arrowtooth	2,434	2	89
Total hook-and-line	97,787	55	61
Total pot gear	6,944	0	0
TOTAL 1991 BSAI	2,155,112	43,311	35,785

Table 2. 1992 groundfish catch in the BSAI groundfish fisheries (metric tons) and associated bycatch of chinook salmon and other salmon (numbers of fish), based on NMFS blend estimates of groundfish catch and observed salmon bycatch rates.

BSAI TARGET FISHERY	GROUNDFISH	CHINOOK SAL	OTHER SAL
Trawl Fisheries			
Atka Mackerel	52,460	35	8
Bottom pollock	679,063	15,994	3,747
Pacific cod	81,042	4,942	33
Rockfish	19,328	1,169	5
Midwater pollock	764,290	19,906	35,860
Rocksole	55,448	37	0
Sablefish	31	0	0
Other flatfish	7,339	65	0
Yellowfin sole	198,533	198	1,017
Other	888	5	0
Total Hook-and-line	123,077	50	117
Total Pot gear	14,439	0	0
TOTAL 1992 BSAI	1,995,938	42,400	40,788

increased harvests of pollock by vessels delivering to the shoreside component and that typically operate in near shore areas that historically experienced high salmon bycatch (Federal reporting areas 519 and 517), and (2) the proposed delay of the pollock "B" season from June 1 to August 15, which would extend the pollock fishery into fall months when historical chinook salmon bycatch rates in the BSAI trawl fisheries increase relative to summer months.

In general, no information exists to indicate that the current level of salmon bycatch in the Alaska trawl fisheries presents critical conservation issues; however, low salmon returns for some Western Alaska stocks indicate that the potential exists for conservation concerns. Although a mixed stock bycatch of salmon in the trawl fisheries could disproportionately affect jeopardized stocks, insufficient information exists on the ocean distribution of individual stocks to specifically manage for a desired escapement goal through the establishment of a salmon bycatch limit for the BSAI trawl fleet. The potential effect of chinook salmon bycatch on Western Alaska chinook runs is discussed in the EA/RIR/IRFA prepared for Amendment 21b. In summary, the approximate impact of chinook salmon bycatch on the returns to the Nushagak and Yukon Rivers is used as a rough approximation of the impact of chinook salmon bycatch on Western Alaska systems in general, which contribute to most of the chinook salmon bycatch in the BSAI trawl fisheries. If all chinook salmon bycatch in the BSAI trawl fisheries ceased, only a very small percentage increase would occur in chinook salmon returns to any Western Alaska system. Although considerable interannual variability occurs, the average percentage by which Yukon River chinook salmon abundance might have increased was approximately 2 percent, and the average percentage addition to the Nushagak River was approximately 4 percent.²

Whether the impact costs associated with the current or anticipated level of salmon bycatch in the groundfish fisheries include foregone harvest opportunities in the commercial salmon fisheries depends on status of individual salmon stocks and whether bycatch savings would contribute toward meeting escapement goals or enhancing subsistence, sport or commercial fisheries. A fuller discussion of the potential effects of incidental chinook salmon bycatch mortality on Western Alaska chinook salmon stocks is presented in the EA/RIR/IRFA prepared

² Summarized from page 2-20 of the public review draft of the EA/RIR/IRFA for Amendment 21b (Salmon Bycatch Management) to the FMP for the Groundfish Fishery of the Bering Sea and Aleutian Islands, dated March 18, 1993. The Council is scheduled to take final action on salmon bycatch management measures that include time/area closures and chinook salmon bycatch limits at its April 1993 meeting.

for Amendment 21b to the BSAI FMP.

Whether or not the current levels of bycatch present a conservation issue, this level of bycatch continues to be a sensitive issue among fishermen and others. Subsistence, commercial, and sport fishing advocates have lobbied the Council to adopt management measures to limit salmon bycatch in the Alaska groundfish trawl fisheries, especially those conducted in the BSAI. Although a certain level of salmon bycatch is unavoidable in the groundfish fisheries, a management objective to discourage fishing practices that result in unusually high salmon bycatch rates would be facilitated through measures that internalize the costs of salmon bycatch within the groundfish industry. The Council is considering chinook salmon bycatch management measures for the BSAI groundfish fisheries under Amendment 21b to the BSAI FMP. The draft analysis for these measures includes alternatives for time/area closures and chinook salmon bycatch limits. If approved, chinook salmon bycatch management measures could be implemented early in 1994.

In January 1993, the Council requested that an analysis be developed to support Council reconsideration of a salmon VIP. The Council originally adopted a salmon VIP in 1991 under Amendment 19 to the FMP. However, this program was not implemented because proper observer sampling procedures and statistical methodology had not been developed to adequately monitor salmon bycatch for purposes of an individual vessel incentive program. The Council's January 1993 request was initiated in response to BSAI salmon bycatch management measures being considered by the Council under Amendment 21b that include chinook salmon bycatch limits and time/area closures for trawl operations to reduce chinook salmon bycatch. In the past, VIPs for halibut and red king crab have been implemented to decrease the costs associated with prohibited species bycatch limits. The intent of these incentive programs was to reduce halibut and crab bycatch rates and increase the amount of groundfish harvested under established bycatch limits.

If the Council recommends that a chinook salmon bycatch limit be established for the BSAI trawl fisheries, one intent of a salmon incentive program would be to reduce the potential costs of salmon bycatch management measures by reducing salmon bycatch rates and allowing larger harvests of groundfish under salmon bycatch restrictions. If the Council does not recommend that a chinook salmon bycatch limit be implemented at this time under Amendment 21b, the objective of a salmon incentive program arguably would be to provide individual fishing operations with an incentive to eliminate fishing practices that result in unusually high salmon bycatch rates.

Several issues contribute to the salmon bycatch problem and the derivation of an appropriate salmon VIP. They include concerns

about statistically valid estimates of salmon bycatch, the effect of annual fluctuations of ocean salmon abundance on salmon bycatch mortality levels, the ability of vessel operators to take action to predictably reduce or avoid salmon bycatch, and potentially high enforcement costs of a vessel incentive program. A fuller discussion of these issues follow.

Statistically valid estimates of salmon bycatch. National Marine Fisheries Service (NMFS) staff are assessing current procedures used to estimate salmon bycatch in the Bering Sea and Gulf of Alaska groundfish fisheries. This assessment was initiated because of concerns that current procedures used to estimate salmon bycatch amounts in the Alaska groundfish fisheries may not provide statistically valid results for a fishery as a whole, much less for an individual vessel. These concerns ensue from the "clustered event" nature of salmon bycatch and doubts about the validity of current estimation procedures used to extrapolate observed salmon bycatch rates to unobserved catch to estimate total salmon bycatch amounts.

If current procedures do not lead to estimates of sufficient accuracy to develop a salmon bycatch management program, NMFS intends to explore alternative observer sampling procedures or statistical methodology to obtain statistically valid estimates of salmon bycatch. Sampling and statistical procedures used to estimate salmon bycatch and bycatch rates will become increasingly important in gauging the effect that existing or proposed management measures have on the salmon bycatch problem. At this time, questions exist whether a salmon bycatch limit could be implemented until NMFS has more fully assessed the nature of salmon bycatch in the Alaska groundfish fisheries and developed appropriate procedures to estimate salmon bycatch amounts. Questions also exist on whether reducing salmon bycatch in the groundfish fisheries is a cost effective method of increasing salmon returns and whether management measures implemented to reduce salmon bycatch would result in net benefits to the nation.

Effect of annual fluctuations of ocean salmon abundance on salmon bycatch mortality levels. Historical catch data summarized in the EA/RIR/IRFA for Amendment 21b indicate that years of relatively high chinook salmon bycatch amounts in the groundfish trawl fisheries coincide with subsequent high abundance of salmon returning to spawning grounds. This pattern suggests that the abundance of salmon is reflected in bycatch levels and that salmon bycatch limits and salmon bycatch standards under a VIP program should be established at levels to accommodate annual fluctuations in salmon abundance. A frameworked process to facilitate adjustments when salmon abundance is high or low may not be practicable given that index information on the ocean abundance of salmon may be difficult to develop in a timely manner. The apparent correlation of salmon bycatch with

abundance of salmon also raises questions about the magnitude of the salmon bycatch problem if salmon bycatch is high when salmon abundance is high and bycatch is low when salmon abundance is low.

Effectiveness of a VIP to reduce salmon bycatch rates. Historical bycatch patterns analyzed in the draft EA/RIR/IRFA prepared for Amendment 21b support time/area closures to reduce chinook salmon bycatch in the BSAI trawl fisheries. Nonetheless, a high degree of unpredictability is associated with salmon bycatch on a haul by haul basis and difficulties exist for individual vessel operators to take action that will predictably reduce salmon bycatch rates. Fundamental questions exist, therefore, whether vessel operators can take action to avoid salmon to comply with specified bycatch standards and whether a salmon VIP can effectively reduce salmon bycatch rates.

Monitoring and enforcement costs. The monitoring and enforcement of a salmon incentive program and the prosecution of violators would require additional staff commitment within the Observer Program, NMFS Enforcement, and General Counsel. Given current budget and staffing, concerns exist whether sufficient resources exist to implement any incentive program in a manner envisioned by the Council. Violations of the existing VIP program for halibut require significant amounts of staff time to assess and develop appropriate case histories to support possible prosecution. At this time, three notices of violation have been issued since the halibut VIP was implemented in 1991. Even if more funds were available for observers and enforcement, questions exist whether allocation of additional resources to support a salmon VIP would be the best use of those resources.

1.2 Alternatives for a Salmon VIP

Alternative 1: No action (status quo alternative). No vessel incentive program for salmon would be implemented.

Alternative 2: Implement a salmon VIP for the BSAI trawl fisheries.

Option 1. Implement a vessel incentive program similar to the halibut incentive program so that salmon bycatch rate standards and monitoring of vessel compliance would be based on observed bycatch rates in the sampled portion of observed hauls (number of salmon per metric ton of groundfish catch).

Initial consideration of this option by NMFS statisticians indicate that observer sampling procedures would need to be changed substantially and a significant amount of staff time committed to develop appropriate statistical procedures to derive valid estimates of vessel bycatch rates. Whole haul sampling for salmon, or a minimum sample size of at least

one or two metric ton may be required to support this approach for a salmon VIP. When possible, observers are encouraged to do either whole or partial haul sampling for salmon. Nonetheless, at-sea sampling conditions and other observer sampling requirements result in about 36 percent of the sampled hauls in the midwater pollock fishery being basket sampled. The percentage of basket sampling is higher in other fisheries.³ Concerns exist, therefore, that required changes to observer sampling procedures would require a large amount of additional experimentation and assessment. Ultimately, revised procedures may not be possible to implement or may not be easily adaptable to all vessels and fisheries.

Option 2. Implement a salmon incentive program that is independent of observer sampling procedures. Three suboptions are considered:

Option 2a. Specify a standard (observed number of salmon, all species combined) that a vessel would be allowed on a weekly basis, independent of catch. Incidental takes of salmon that exceed the standard would constitute a violation. Fines could be for just exceeding the standard or for each salmon that was counted that exceeded the standard. This alternative would eliminate many of the problems associated with a rate-based incentive program under Option 1. All salmon species would be included under the program to eliminate problems associated with whether or not an observer correctly identified salmon species and also would allow salmon to be counted that the observer isn't able to identify to species. All salmon counted in a sampled haul would be credited against the weekly standard. No extrapolation or estimation of salmon bycatch would be involved. The only data used would be the number of salmon counted by an observer in sampled hauls.

Option 2b. Specify a salmon bycatch rate standard for all trawl fisheries based on the observed number of salmon, all species combined, and the amount of groundfish retained during a weekly reporting period. Vessels that exceed the specified bycatch rate standard during a week would be subject to prosecution as violators of the incentive program. This program would require that round weight estimates of total retained catch be derived using product recovery rates (at-sea processing operations) or landed

³ During the 1992 midwater pollock fishery, 28 percent of the observed hauls were whole haul sampled, 36 percent were partial haul sampled, and 36 percent were basket sampled. Janet Wall, NMFS Observer Program, personal communication, April, 1993.

weights (shoreside processing operations). Weekly production reports submitted by at-sea processors and fish ticket information submitted for shoreside deliveries would be used to determine amounts of retained catch for each observed vessel. Although this option for the incentive program would allow those vessels retaining more groundfish to take more salmon, use of round weight equivalents of reported catch would raise questions about appropriate product recovery rates and whether retained catch was correctly reported to NMFS. As a result, the monitoring and enforcement of this option would be more complicated and likely result in fewer violations being prosecuted relative to Option 2a.

Option 2c. In addition to either Option 2a or 2b, all salmon incidentally taken in the BSAI trawl fisheries must be retained for observation by either an at-sea or shoreside observer. All salmon retained onboard vessels must be stored separately from other fish product to facilitate access by observers or enforcement agents and inventory of salmon product onboard. Under this alternative, regulatory constraints maybe possible that would set forth processing standards for retained salmon (e.g., all salmon must be dressed and gilled, and either iced on catcher vessels or processed as Individual Quick Frozen (IQF) product on processor vessels). Furthermore, regulations could require that retained salmon be transferred to designated ports where NMFS agents could take possession of salmon and either make it available to nonprofit foodbank organizations, revert to sale of the fish, or dispose of the salmon in the most appropriate manner available. General Counsel- Alaska Region has raised legal concerns about regulations that would mandate how salmon are treated onboard a vessel or at a shoreside operation and the subsequent deposition of retained salmon by NMFS. These question will need to be resolved before final Council consideration of this option is scheduled.

If, under this option, all incidentally taken salmon or salmon product were delivered to either Dutch Harbor or Kodiak in a condition suitable for human consumption for transfer to NMFS Enforcement agents, a new salmon product transfer report would need to be submitted by vessel operators to report transfer of salmon prior to any offloading of salmon from one vessel to another or from a vessel to a shoreside processing operation. The salmon transfer report would include information on vessel name, name of vessel or agent the salmon is transferred to, the date salmon will arrive in Dutch Harbor or Kodiak, and the number of salmon transferred. Amounts of retained salmon would also be reported in daily fishing logbooks or daily cumulative production logbooks and weekly production

reports. Although salmon could be offloaded at ports other than Dutch Harbor or Kodiak, vessel operators would be required to submit a salmon transfer report indicating the agent used to transfer salmon from port of landing to either Kodiak or Dutch Harbor.

2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

An environmental assessment (EA) is required by NOAA in compliance with the National Environmental Policy Act of 1969 (NEPA). The purpose of an EA is to determine whether significant impacts on the quality of the human environment could result from a proposed action. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared if the proposed action may cause a significant impact on the quality of the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives for the subject proposed action were discussed in Sections 1.1 and 1.2 of this document. Section 2 contains the discussion of the environmental impacts of the alternatives, including impacts on threatened and endangered species and marine mammals.

The following three alternatives are analyzed in response to the requirements described above.

2.1 Environmental Impacts of the Alternatives

The types of environmental impacts that are generally associated with fishery management actions concern effects resulting from 1) overharvesting fish stocks, which might involve changes in predator-prey relationships among invertebrates and vertebrates, including marine mammals and birds, 2) physical changes as a direct result of fishing practices affecting the sea bed, and 3) nutrient changes due to fish processing and discarding fish wastes into the sea. A summary of the effects of the 1993 groundfish total allowable catch amounts on the biological environment and associated impacts on marine mammals, seabirds, other predators and prey, and threatened or endangered salmon is set forth in the final environmental assessment for 1993 groundfish total allowable catch specifications (NMFS, 1993a).

If a chinook salmon bycatch limit for the BSAI trawl fisheries is adopted by the Council and implemented under Amendment 21b to the FMP, fishery closures that accompany the bycatch limit would be intended to limit chinook salmon bycatch amounts to "acceptable" levels. If the chinook salmon bycatch limit were routinely taken, therefore, implementation of any of the alternatives for a salmon VIP would not necessarily be expected to significantly affect the amount of salmon incidentally taken in groundfish trawl fisheries, although the amount of groundfish harvested under other salmon bycatch restrictions may increase. The amount of additional groundfish harvested would be dependent upon the desire and ability of groundfish fishermen to avoid excessive salmon bycatch.

If the Council does not recommend to implement a chinook salmon bycatch limit or the salmon bycatch limit is not taken, a salmon VIP could result in a decrease of salmon bycatch if (1) sufficient incentive is provided to vessel operators to take action to avoid unusually high bycatch rates of salmon, and (2) NMFS is provided adequate resources to effectively monitor and enforce the program. Conservation issues associated with chinook salmon bycatch in the BSAI trawl fisheries were discussed above under the problem statement for the proposed action. Additional information on the potential effect of chinook salmon bycatch on salmon stocks is present in the EA/RIR/IRFA prepared for Amendment 21b.

Mandatory retention of salmon under Alternative 2, Option 2c, would facilitate the collection of biological data from salmon incidentally taken in the groundfish trawl fisheries. Shoreside delivery of this salmon to Dutch Harbor or Kodiak would allow NMFS observers or staff from other management agencies to easily collect scale samples, survey landed salmon for coded-wire tags that had not been collected by at-sea observers, and augment existing information on the amount and species distribution of salmon bycatch in the BSAI trawl fisheries.

None of the alternatives considered are expected to have any effect on species of Pacific salmon listed under the Endangered Species Act that have not already been considered under an informal consultation that was concluded on April __, 1993 (NMFS 1993b).

2.2 Effects on Endangered and Threatened Species and on the Alaska Coastal Zone

None of the alternatives are expected to have any adverse effect on endangered or threatened species or their habitat. Thus, formal consultation under Section 7 of the Endangered Species Act is not required.

Also, each of the alternatives would be conducted in a manner

consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

2.3 Findings of No Significant Environmental Impact

For the reasons discussed above, neither implementation of the proposed action nor any of the alternatives to that action would significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the preferred action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

3.0 REGULATORY IMPACT REVIEW: SOCIAL AND ECONOMIC IMPACTS OF THE ALTERNATIVES

A review of the social and economic impacts of the alternatives provides information about those industry members affected by the proposed action and the economic gains or losses they are likely to experience as a result of the action. This section also addresses the requirements of both E.O. 12291 and the Regulatory Flexibility Act to provide adequate information to determine whether an action is "major" under E.O. 12291 or will result in "significant" impacts on small entities under the RFA.

Executive Order 12291 applies to the issuance of new rules, the review of existing rules, and the development of legislative proposals concerning regulations. The E.O. requires that:

- (1) regulatory objectives and priorities be established with the aim of maximizing aggregate net benefits to society, taking into account the condition of the particular industries affected by the regulations, the condition of the national economy, and other actions contemplated for the future;
- (2) decisions be based on adequate information concerning the need for and consequences of the proposed action;
- (3) the chosen regulatory approach or alternative be the one with the least net cost to society, if practicable; and
- (4) regulatory action should not be undertaken unless the potential benefits outweigh the potential costs to society.

E.O. 12291 also requires the Secretary of Commerce to determine whether the impact of a regulation is "major" and, if so, complete a Regulatory Impact Analysis (RIA) of the alternatives. A major regulation is one that is likely to result in: (1) an

annual effect on the economy of \$100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S based enterprises to compete with foreign based enterprises in domestic or export markets.

A description of the purpose and need for a salmon VIP and alternatives considered were described in Sections 1.1 and 1.2. The social impacts associated with a salmon VIP are linked directly to the allocation of the salmon resource among different users. The social impacts associated with different uses of salmon are described in the draft IRFA prepared for Amendment 21b. As described above, salmon are used as bycatch in the groundfish fisheries and other fisheries, to meet minimum escapement goals on the spawning grounds, and as catch in the directed subsistence, commercial and sport fisheries.

The economic impacts of these alternatives are discussed below.

3.1 Alternative 1. (Status quo alternative)

Under Alternative 1, no action would be taken and the status quo would remain. Vessel operators would not incur costs associated with taking action to avoid salmon bycatch under Options 2a or 2b of Alternative 2 or processing and transporting incidentally taken salmon under option 2c of Alternative 2. The costs of salmon bycatch management measures implemented under Amendment 21b (i.e., a salmon bycatch limit) could increase if a VIP is not established for salmon. Without a VIP, individual vessel operators are not provided a direct incentive to take action to reduce salmon bycatch rates. Therefore, more groundfish than necessary may be foregone because the salmon bycatch limit may be reached earlier than it would have been under an effective VIP.

3.2 Alternative 2. Implement a salmon VIP for the BSAI trawl fisheries.

Option 1. Adopt a rate-based incentive program similar to the incentive program implemented for Pacific halibut. Adoption of this alternative would require substantial changes to observer sampling procedures and the development of appropriate statistical procedures to derive valid estimates of vessel bycatch rates. The EA/RIR/IRFA prepared for Amendment 21b evaluated a salmon VIP similar to that which would be implemented under Option 1 using a monthly chinook salmon bycatch rate standard of 0.02 chinook salmon per metric ton of groundfish catch. A discussion of this alternative is set forth in the Amendment 21 analysis and is not repeated here. At this time, concerns exist that the practical application of this

alternative may not be possible given the existing difficulties associated with assessing potential violations and successfully prosecuting violators of a rate-based incentive program that is dependent on observer sampling procedures.

Option 2a. Using 1992 observer data, a frequency distribution of observed salmon numbers during a week are shown in Figures 1 - 4 for shoreside, factory trawler, mothership and combined groundfish processor operations. Shorebased operations generally show higher bycatch numbers because catcher vessel delivering to these operations typically fish in near shore areas that experience seasonally high bycatch rates of salmon and often land unsorted catch that is amenable to whole haul sampling for salmon by observers (Table 3). If a bycatch standard of 100 observed salmon per week had been in effect in 1992, 41 violations would have occurred (all but one from shoreside operations). A standard of 60 salmon per week would have resulted in 80 violations during 1992.

Option 2b. For purposes of this analysis, vessel specific bycatch rates were readily available only for the factory trawler fleet. Figure 5 shows the frequency of bycatch rates for intervals of .005 salmon/mt retained groundfish for factory trawlers during 1992. Average bycatch rates for the BSAI trawl fisheries are listed in Table 4. Ninety percent of the weekly observer reports indicated bycatch rates below a rate of 0.03 salmon/mt of retained groundfish. Using this rate, 29 violations of the incentive program would have occurred within the factory trawler fleet during 1992.

The cost to the trawl industry to comply with an incentive program based on Option 1 or 2 would depend on the effectiveness of actions that vessel operators may take to avoid salmon bycatch. If an effective salmon VIP is not possible because vessel operators cannot take action that predictably reduce bycatch rates, then the effect of an incentive program under Alternative 2 may not differ significantly from the status quo alternative in terms of salmon bycatch and groundfish catch. However, Alternative 2 would impose a random cost on vessels and increase management and enforcement costs. Therefore, if the determination is made that vessel operators cannot take action that predictably reduce salmon bycatch rates, options for a VIP under Alternative 2 would impose costs without resulting in any offsetting benefits. From an administrative view, Option 2a would be the least costly to implement and enforce, and Option 1 would be the most costly.

Violations under any of the VIPs set forth under Alternative 2 would be subject to prosecution and liable for a civil penalty under section 308 of the Magnuson Act. The Magnuson Act currently establishes a maximum penalty of \$100,000 for each

FIGURE 1

**FREQUENCY DISTRIBUTION OF SALMON OBSERVED DURING A WEEK IN BSAI SHORESIDE OPERATIONS -
BASED ON 1992 OBSERVER DATA (N = 617)**

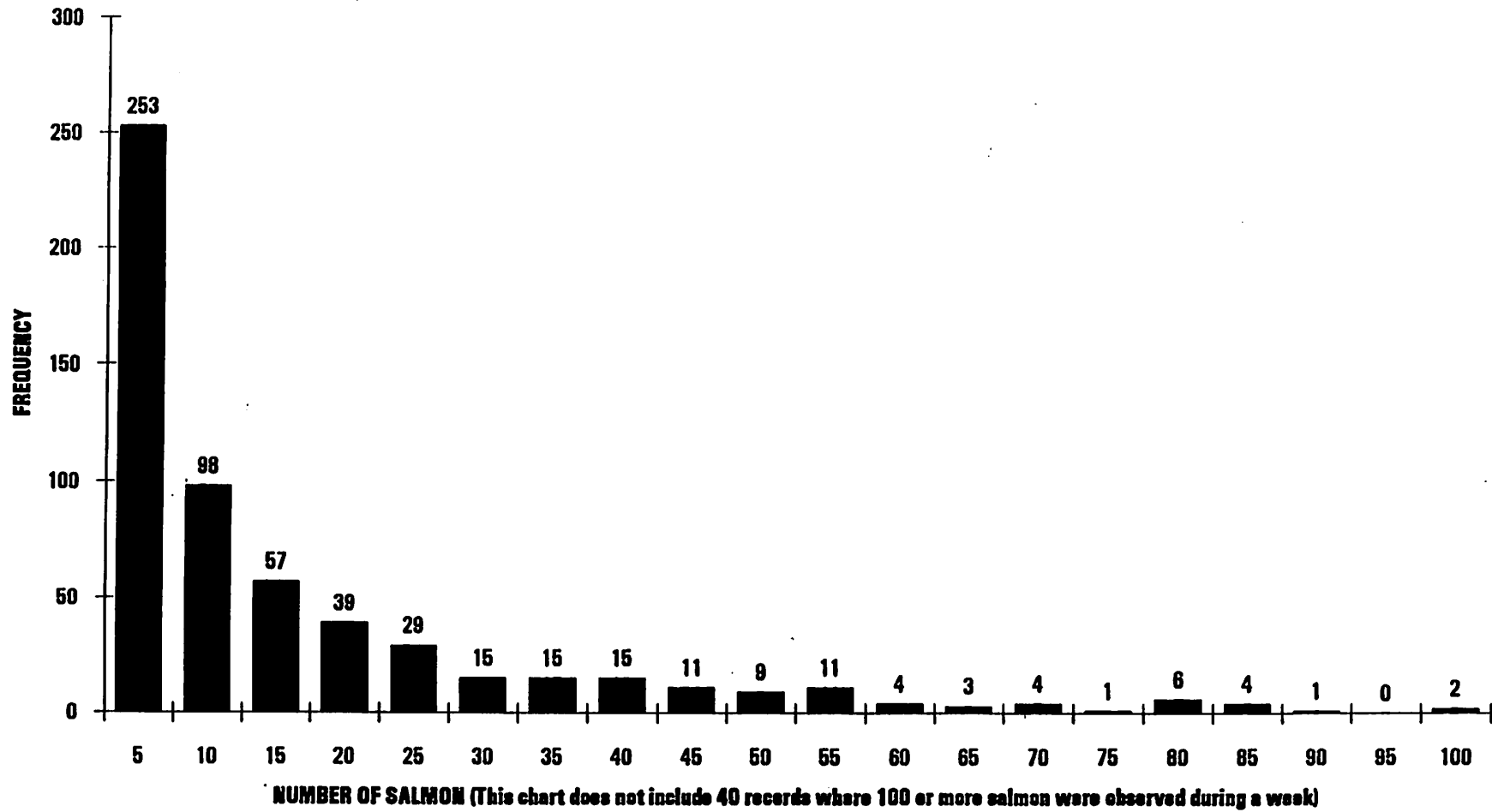
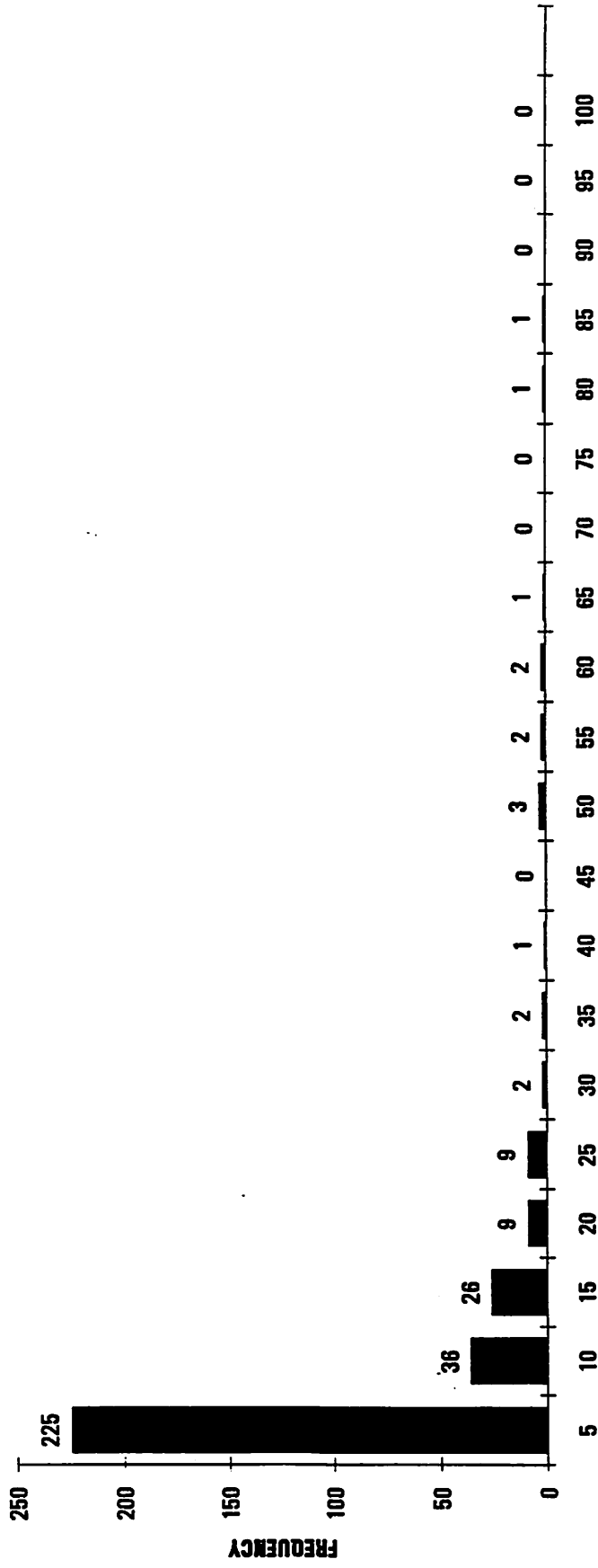


FIGURE 2

FREQUENCY DISTRIBUTION OF SALMON OBSERVED DURING A WEEK IN BSAI FACTORY TRAWLER OPERATIONS
BASED ON 1992 OBSERVER DATA (N = 321)



NUMBER OF SALMON (This chart does not include 1 record where 100 or more salmon were observed during a week)

FIGURE 3

FREQUENCY DISTRIBUTION OF SALMON OBSERVED DURING A WEEK IN BSAI MATHERSHIP OPERATIONS - BASED ON 1992 DATA (N= 283)

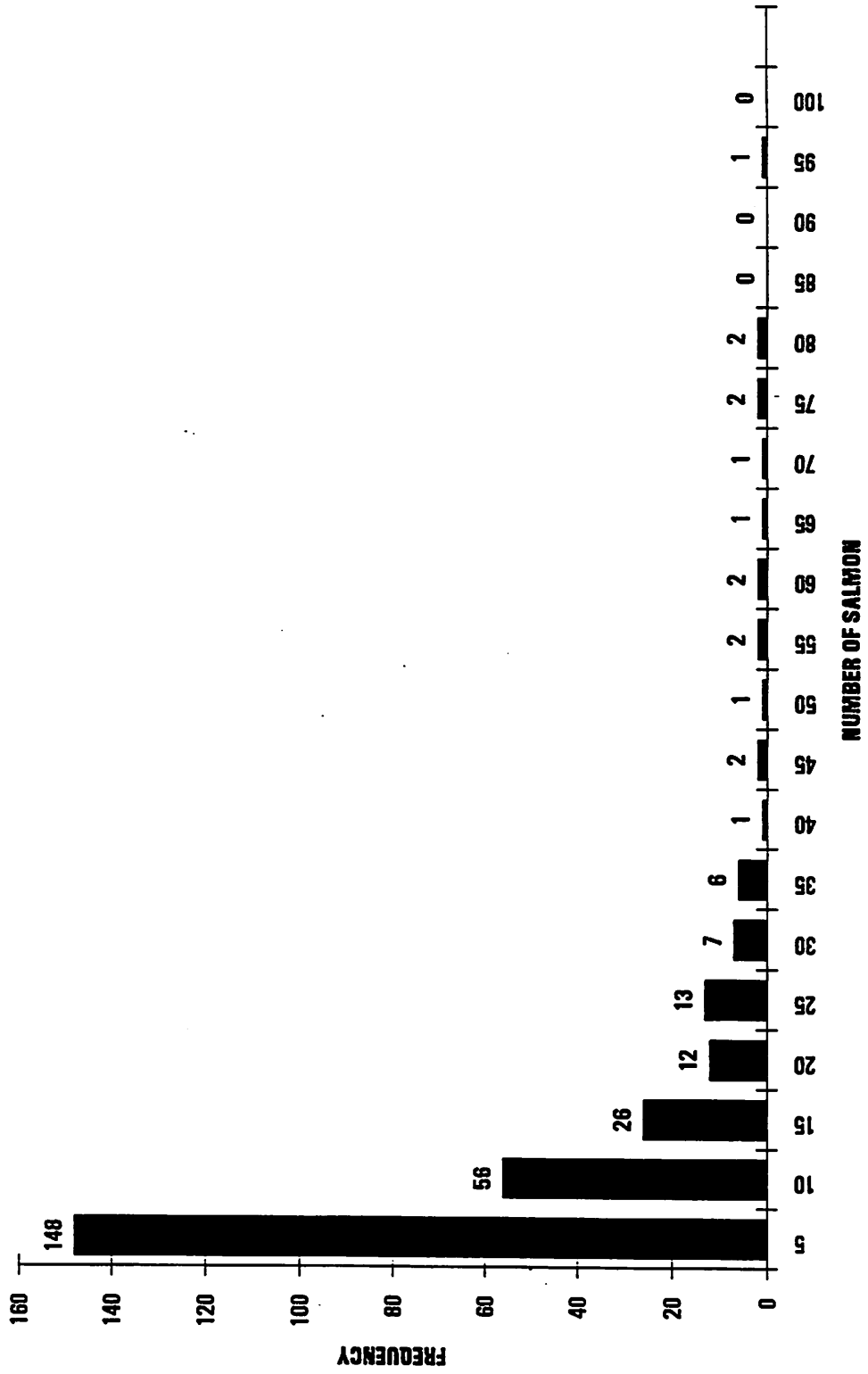


FIGURE 4

**FREQUENCY DISTRIBUTION OF SALMON OBSERVED DURING A WEEK IN BSAI GROUND FISH OPERATIONS --
BASED ON 1992 OBSERVER DATA $N = (1221)$**

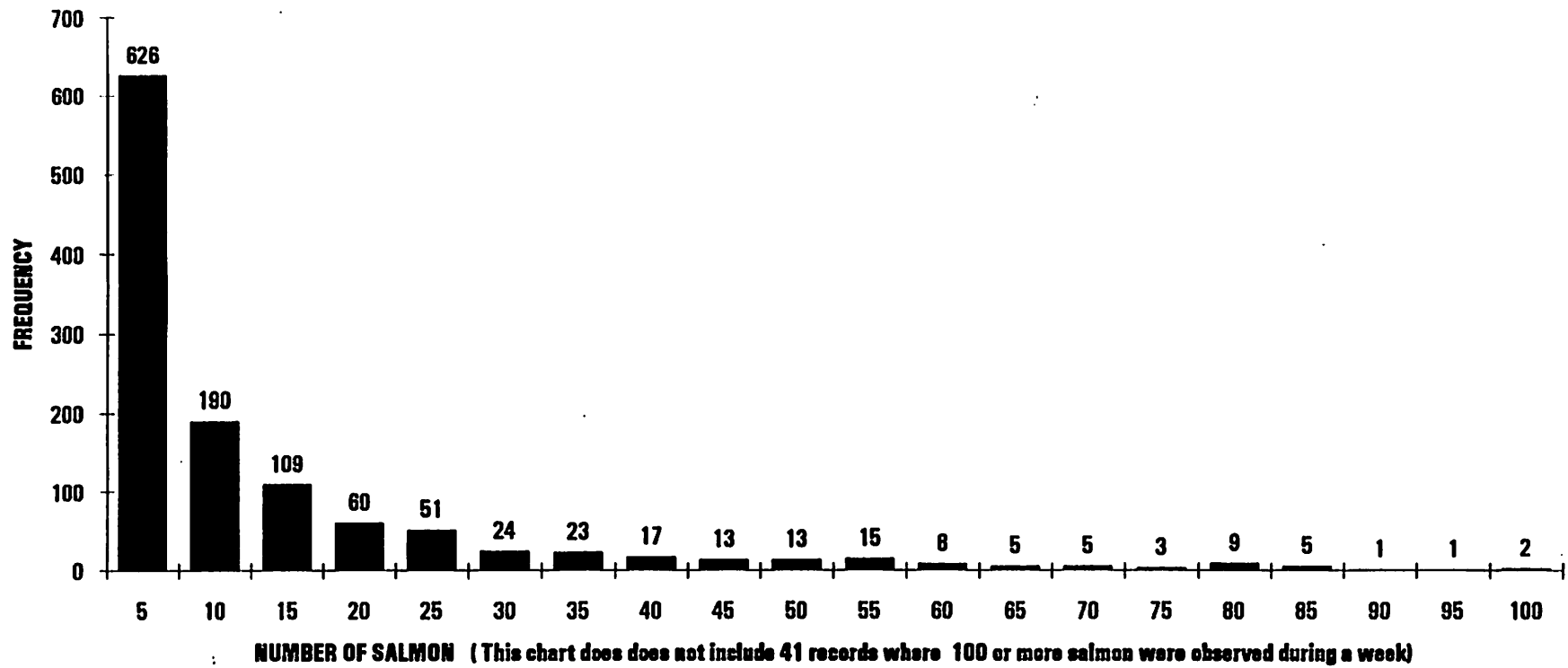


Table 3. Summary of 1992 observer data on number of chinook salmon and 'other salmon' counted each week, by processor mode and target trawl fishery.

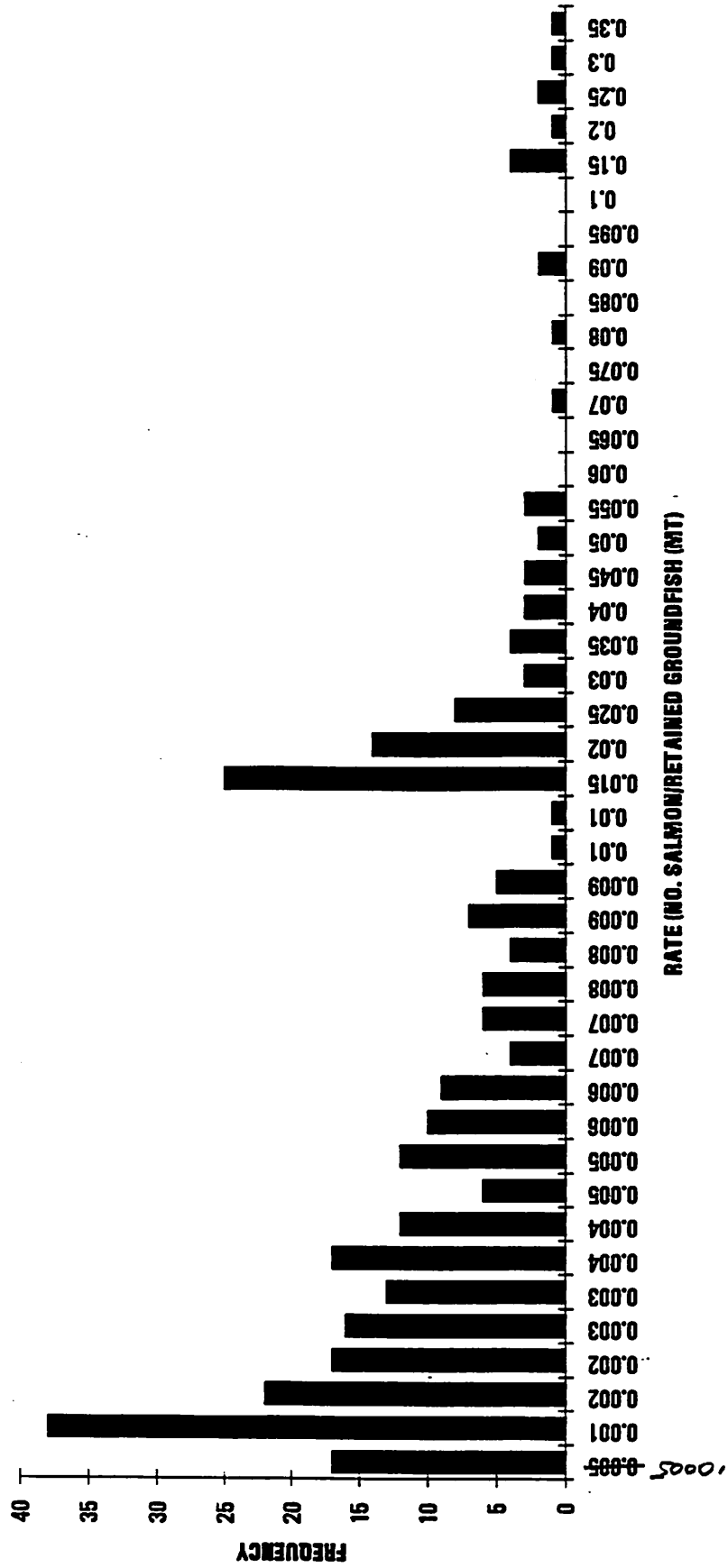
<u>Processor Mode and Fishery</u>	<u>Chinook salmon</u>	<u>Other Salmon</u>	<u>Total</u>
Shoreside			
Midwater pollock	3,158	18,898	22,056
Bottom pollock	810	119	929
Pacific cod	183	6	189
All other	10	0	10
Total	4,161	19,023	23,184
Factory Trawler			
Midwater pollock	1,700	200	1,900
Bottom pollock	60	6	66
Pacific cod	108	2	110
All other	63	22	85
Total	1,931	230	2,161
Mothership			
Midwater pollock	1,885	627	2,512
Bottom pollock	108	44	152
Pacific cod	56	0	56
All other	1	0	1
Total	2,050	671	2,721
TOTAL SALMON	8,142	19,924	28,066

Table 4. Summary of 1992 observer data on salmon bycatch rates (observed number of salmon per metric ton of retained groundfish) for the BSAI factory trawler fleet.

<u>Fishery</u>	<u>Chinook salmon</u>	<u>Other Salmon</u>	<u>Total</u>
Midwater pollock	0.0079	0.0023	0.0063
Bottom pollock	0.0041	0.0059	0.0042
Pacific cod	0.0111	0.0039	0.0107
All other	0.0080	0.0045	0.0067
Total	0.0078	0.0024	0.0063

FIGURE 5

BYCATCH RATE OF SALMON BASED ON 1992 OBSERVER DATA FROM FACTORY TRAWLER FLEET (RATE = NO. SALMON OBSERVED/RETAINED GROUND FISH (MT)) $N = 303$



violation. The amount of the civil penalty assessed for each violation of the salmon VIP would be determined by General Council - Alaska Region based on the nature, circumstances, extent, and gravity of the violation and, with respect to the violator, the degree of culpability, any history of prior offenses, ability to pay, and other matters as justice may require.

Option 2c. Under this option, all salmon taken incidentally in the BSAI trawl fisheries must be retained for observation by an observer. Suboptions to require that retained salmon be dressed and processed for human consumption also are possible. Enforcement of this requirement for unobserved catch would be difficult, but benefits would occur to the extent that observed and unobserved vessels comply with this requirement. Furthermore, discard "waste" of salmon bycatch could be reduced if these fish were properly dressed and processed for human consumption (e.g., distributed to non-profit foodbank organizations) or sold by NMFS enforcement agents. Costs associated with incidentally taken salmon would be those associated with the burden of properly dressing and processing salmon and costs associated with transporting salmon to designated ports (either Dutch Harbor or Kodiak). Most shoreside deliveries of groundfish harvested in the BSAI are landed in Dutch Harbor. Catcher vessels landing groundfish at this port or processor vessels that routinely return to Dutch Harbor for supplies would not be expected to experience significant additional costs associated with delivering retained salmon to Dutch Harbor. Owners/operators of vessels that deliver to other shoreside operations or offload catch to at-sea support vessels could be required to pay the cost of transporting retained salmon to either Dutch Harbor or Kodiak. These costs would vary with area and operation. For example, typical costs for at-sea transport of salmon to Dutch Harbor from remote shoreside operations such as Chignik or Sand Point are estimated at about \$8.12 per 100 lbs, with a \$45 minimum. Air freight costs are more expensive. From Sand Point, air freight to Dutch Harbor is \$0.88 per lb with a \$28 minimum. From St. Paul, the cost is \$0.55 per lb with the same minimum cost. All vessels that retain salmon could incur additional reporting costs resulting from submission of a salmon transfer report. These costs are discussed below.

Similar to Options 2a and 2b, if vessel operators cannot take action that predictably reduce salmon bycatch rates, Option 2c would randomly impose costs on vessels. Unlike Options 2a and 2b, however, Option 2c could result in some offsetting benefits in terms of decreased waste if salmon are retained and processed for human consumption or other purposes.

3.4 Reporting Costs

Under Alternatives 1 and Options 2a and 2b of Alternative 2, reporting costs by vessels currently participating in the BSAI trawl fisheries would not change. Under Option 2c of Alternative 2, vessels would be required to retain incidentally taken salmon for observation and possibly deliver that salmon to either Dutch Harbor or Kodiak. Vessel operators also may be required to submit to NMFS a salmon transfer report prior to offloading salmon or salmon product that would report the number of salmon retained and when salmon would be landed at the either Dutch Harbor or Kodiak. Information recorded on the salmon transfer report would be similar to that currently reported on the product transfer log. Costs to vessel companies to comply with this requirement include (1) employee costs associated with time spent filling out and submitting the salmon transfer report, and (2) submission costs. Assuming an average wage of about \$15.00 per hour, and that individual reports would require about 10 minutes to fill out and submit, time spent complying with the this information collection may cost the trawl industry about \$3,000 per year.⁴ The cost of submitting salmon transfer reports to NMFS via Telefax machine, the most common mode of transmitting industry reports to NMFS, would be about \$2.00 per land based transmission. Given the potential number of submissions (1,221 per footnote 4), the annual cost to the trawl industry would be about \$2,442. At-sea transmission of telefax reports is more expensive at about \$8.00 per transmission. If all at sea processors submitted reports in this manner rather than through a land-based company representative, annual submission costs could be as high as \$6,066 (\$4,832 for processor vessels plus \$1,234 for shoreside operations).

3.5 Administrative, Enforcement and Information Costs

The costs of implementing, monitoring, and enforcing VIPs are high. The effectiveness of a VIP is severely undermined if adequate staff are not available to enforce the program and prosecute violations in a timely manner. Options under Alternative 2 are designed to minimize the difficulties of "proving" a violation has taken place based on observer sampling data, thereby, facilitating the enforcement and prosecution of violations. Prosecution of violators of the incentive program proposed under these alternatives likely could be accommodated at

⁴ This cost estimate was derived based on 1992 data that showed 1,221 weekly observer reports included salmon bycatch amounts [(1,221 incidence of salmon bycatch during a week) (10 minutes per report/60 minutes per hour) (\$15.00 per hour wage) equals \$3,050]. This estimate assumes that vessel offload each week.

existing staff levels, although the additional workload on Observer Program, Enforcement, and General Council staff likely would require an adjustment of other staff priorities.

Implementation of a salmon VIP as proposed under Option 1 of Alternative 2 would require substantial staff time to develop, implement and enforce. At a minimum, one additional lawyer (General Counsel - Alaska Region) and NMFS enforcement agent would be required to enforce the program and prosecute violators. Annual costs associated with hiring a GS-13 lawyer and a GS-12 enforcement agent would total about \$140,000. These costs include benefits, rental of office space, and necessary office furniture and equipment. Additional moving expenses could be as high as \$20,000 per person. Additional staff within the NMFS Observer Program also may be required to accommodate additional workload associated with debriefing observers, processing additional data requests necessary for enforcement and documentation of violations, and general increased workload associated with VIPs of this nature.

Option 1 under Alternative 2 also would require additional staff to develop and assess revised observer sampling procedures and statistical methodology (about \$50,000 annually). Vessel owners may also incur costs of additional observers to support revised sampling procedures.

4.0 Initial Regulatory Flexibility Analysis

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities an Initial Regulatory Flexibility Analysis (IRFA) must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

NMFS has defined all fish-harvesting or hatchery businesses that are independently owned and operated, not dominant in their field of operation, with annual receipts not in excess of \$2,000,000 as small businesses. In addition, seafood processors with 500 employees or less, wholesale industry members with 100 employees or less, not-for-profit enterprises, and government jurisdictions with a population of 50,000 or less are considered small entities. A "substantial number" of small entities would generally be 20% of the total universe of small entities affected by the regulation. A regulation would have a "significant impact" on these small entities if it resulted in a reduction in annual gross revenues by more than 5 percent, annual compliance costs that increased total costs of production by more than 5 percent, or compliance costs for small entities that are at least 10 percent higher than compliance costs as a percent of sales for

large entities.

If an action is determined to affect a substantial number of small entities, the analysis must include:

- (1) description and estimate of the number of small entities and total number of entities in a particular affected sector, and total number of small entities affected; and
- (2) analysis of economic impact on small entities, including direct and indirect compliance costs, burden of completing paperwork or recordkeeping requirements, effect on the competitive position of small entities, effect on the small entity's cashflow and liquidity, and ability of small entities to remain in the market.

4.1 Economic Impact on Small Entities

Most catcher vessels harvesting groundfish off Alaska meet the definition of a small entity under the RFA. In 1992, 180 catcher vessels landed groundfish from the BSAI. All these vessels would be affected by a salmon VIP program, particularly those that participate in the pollock fishery (about 123 vessels). The potential costs of penalties under a VIP program are substantial and could result in a significant economic impact on a substantial number of small entities.

5.0 SUMMARY

The adoption of Alternative 2 or 3 would authorize the implementation of a VIP to reduce salmon bycatch rates in the BSAI trawl fisheries. If a chinook salmon bycatch limit for the BSAI trawl fisheries is recommended by the Council under Amendment 21b to the FMP, one intent of a salmon incentive program would be to reduce the potential costs of salmon bycatch management measures by reducing salmon bycatch rates and allowing larger harvests of groundfish under salmon bycatch restrictions. If the Council does not recommend that a chinook salmon bycatch limit be implemented at this time under Amendment 21b, the objective of a salmon incentive program would be aimed at (1) highlighting to the groundfish industry the sensitive management issue created by salmon bycatch mortality in the groundfish trawl fisheries and that actions taken by individual vessels to minimize salmon bycatch is desirable, (2) limiting salmon mortality at the individual vessel level to numbers determined by the Council to result in an overall acceptable level of salmon bycatch mortality in the BSAI groundfish fisheries, and (3) focusing operational constraints on just those vessels that exceed specified salmon bycatch standards under an incentive

program rather than on all trawl operations, as could occur under a chinook salmon bycatch limit.

Adoption of Option 2a under Alternative 2 would provide the simplest approach for an incentive program and involve the least cost to implement and enforce. Option 2c under Alternative 2 would facilitate the collection of biological information on salmon bycatch and possibly provide additional benefit by addressing the perception of waste in the groundfish trawl fisheries if salmon are retained and processed for human consumption or other purposes.

Questions exist whether any of the alternatives considered for a salmon VIP could effectively reduce salmon bycatch rates because of the inherently random nature of salmon bycatch in the BSAI and the difficulties faced by individual vessel operators to take action to predictably avoid salmon.

6.0 LIST OF REFERENCES

National Marine Fisheries Service (NMFS). 1993a. Final environmental assessment for 1993 groundfish total allowable catch specifications implemented under the authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska. Alaska Fisheries Science Center, Seattle, Washington and the Alaska Region, P.O. Box 21668, Juneau, Alaska.

NMFS 1993b. ESA Informal Consultation for groundfish fishing conducted under the Gulf of Alaska and the Bering Sea and Aleutian Islands Groundfish Fishery Management Plans. Alaska Region, P.O. Box 21668, Juneau, Alaska and Northwest Region, 7600 Sand Point Way N.E. BIN C15700, Building 1, Seattle, Washington. April __, 1993.

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NORTHERN DISTRICT SET NETTERS ASSOCIATION OF COOK INLET

est. 1954

2310 E. 20th Ave. * Anchorage, Ak. * 99508
(907) 272-3943

Tate Hayes / Public Testimony: Salmon Bycatch

April 23, 1993

To: North Pacific Fisheries Council Management Council Members:

Mr. Chairman and Members of the Council,

My name is Tate Hayes, I am a lifelong Alaskan and I commercial set net in the N. District of Upper Cook Inlet. I am concerned for the conservation of salmon stocks throughout Alaska, specifically Upper Cook Inlet. I feel that the bycatch of king salmon is a serious issue that must be addressed in a manner which looks at ways of eliminating bycatch of stocks of concern.

Two of the biggest salmon producing river systems in South Central Alaska are currently facing severe conservation problems. These problems occur in the Kenai river sockeye stocks, as well as the Susitna river sockeyes. These conservation problems are due to extreme stress that the Kenai river king salmon are facing. The stress put upon the Kenai River king salmon stocks have created over fishing of Susitna sockeye stocks and under fishing of the Kenai River sockeye stocks. This under and over of established escapement goals is created when attempts are made at protecting the troubled Kenai river king salmon. Biological samples show that a significant # of Cook Inlet king salmon are being taken from the Bering Sea and the North Pacific Basin. Why did the state of Alaska, knowing that there are conservation concerns, allow bycatch of Cook Inlet stocks of concern, to continue?

Both the Kenai river sockeye stock and the Susitna river sockeye stocks are faced with conservation problems that are directly caused by trying to ensure adequate escapement of the Kenai river king salmon. Kenai kings are continually given # 1 priority in management of fisheries throughout Upper Cook Inlet. Without being given #1 priority, Kenai river kings would undoubtedly face severe conservation problems.

I feel that windows could be established, which would allow for minimal salmon bycatch of concerned stocks. These windows can be established if stock identification of bycatch is determined, and time of catch is documented. Establishing times and areas that concerned stocks migrate would enable restricting fishing in certain areas, at the time when concerned stocks are migrating through particular areas. Restricting fishing in these areas would shift concern of bycatch to other areas that harvest concerned stocks. In the presence of biological investigations, showing a relation to Bering Sea king bycatch and the failing of certain Cook Inlet stocks, those who are linked to harm, should pay an assessment, directly allocated to areas of harm.

Salmon bycatch is one of many areas that directly contribute to conservation problems in Alaska, specifically Upper Cook Inlet. Bycatch needs to be curtailed or eliminated in areas where concerned stocks are harvested. Bycatch is not the only area that can be related to conservation problems, but is still of considerable impact. Please consider any techniques which will allow establishment of windows that can be used in eliminating negative impact to concerned stocks.

Thank you for your time and consideration on this very serious issue.



Tate Hayes / Northern District Set Netters Association Board Member



YUKON RIVER DRAINAGE FISHERIES ASSOCIATION

733 WEST 4TH AVENUE SUITE 881 ANCHORAGE, ALASKA 99501 (907) 279-6519

Resolution 93-2

**In support of
measures to document and reduce the bycatch of chinook salmon
in the trawl fisheries of the Bering Sea / Aleutian Islands area**

WHEREAS the Yukon River Drainage Fisheries Association (YRDFA) represents subsistence, commercial and sport fishermen from over fifty communities along the U.S. Yukon River drainage; and

WHEREAS the National Marine Fisheries Service has documented a significant amount of chinook bycatch in the U.S. trawl fisheries of the Bering Sea / Aleutian Islands Area; and

BE IT RESOLVED that the YRDFA requests the NMFS and the ADF&G to institute a comprehensive genetic sampling program to determine river-of-origin of chinook in the trawl bycatch; and

BE IT FURTHER RESOLVED that the YRDFA requests the North Pacific Fishery Management Council to approve a chinook bycatch rate of 0.02 chinook per metric ton with such trawl vessels exceeding this rate to be penalized with fines and lost fishing time under a Vessel Incentive Program.

BE IT FURTHER RESOLVED that the NPFMC and the NMFS require 24 hour coverage by observers so as to insure accurate collection of bycatch data.

COPIES of this resolution to be sent to Steven Pennoyer, Director, Alaska Region, NMFS; to Richard B. Lauber, Chairman, NPFMC; and to Carl Rosier, Commissioner, ADF&G.

Harry O. Wilde, Sr.

Harry O. Wilde, Sr.
Lower Yukon, co-chair

Virgil L. Umphenour

Virgil L. Umphenour
Upper Yukon, co-chair

Attest:

Daniel E. Albrecht

Daniel E. Albrecht
Executive Director

AMENDMENTS TO THE PACIFIC SALMON TREATY: Yukon River Protocol
(excerpt from additions to Annex IV)

4. The Joint Technical Committee shall, by the end of 1993, compile existing information on the status of Porcupine River salmon stocks and on management and research tools available for management of these stocks. Based on this information, the JTC shall: (1) advise the Panel regarding the status of these stocks and the benefits accruing to Porcupine River salmon spawning escapements from the mainstem rebuilding program; (2) prepare a range of potential rebuilding options for the Fishing Branch River fall chum salmon including the option of allowing these stocks to rebuild as a result of the rebuilding program agreed to for the Yukon River mainstem fall chum salmon stock; and (3) recommend to the Panel ways to improve and expand information needed to better manage these stocks for optimum production.
5. Based on information and recommendations provided by the JTC, the Panel shall develop, prior to the 1994 season, recommendations to the Parties regarding rebuilding, restoration and improved management of these Porcupine River stocks.
6. [Canadian Proposal: Catch shares for the Canadian-origin Porcupine River chum salmon stocks after rebuilding shall be recommended to the Parties by the Panel.]

General

1. If information becomes available that indicates that the catch records that provided the basis for the Canadian guideline harvest range in paragraphs 2 (Chum Salmon) and 9 (Chinook Salmon) are erroneously low, at Canada's request the Yukon River Panel may authorize increasing the ranges set out in these paragraphs to reflect the adjusted figures for the Indian Food Fishery and the sport fishery catch.
2. With respect to coho salmon originating in the Yukon River in Canada, the Parties agree that the status of these stocks is not known with certainty. When sufficient information on these stocks becomes available, the Panel shall determine the U.S. contribution to the Fund with respect to such salmon using [Canadian Proposal: the same] [U.S. Proposal: *a similar*] valuation formula as that provided for chinook and chum salmon, unless the Panel decides otherwise.
3. The Parties agree that efforts designed to increase the in-river return of Yukon River origin salmon by reducing the marine catches and bycatches of Yukon River salmon would benefit the status of the Yukon River stocks. The Parties agree to identify, quantify and undertake efforts to reduce these catches and bycatches.
4. [Canadian Proposal: The Parties agree that:

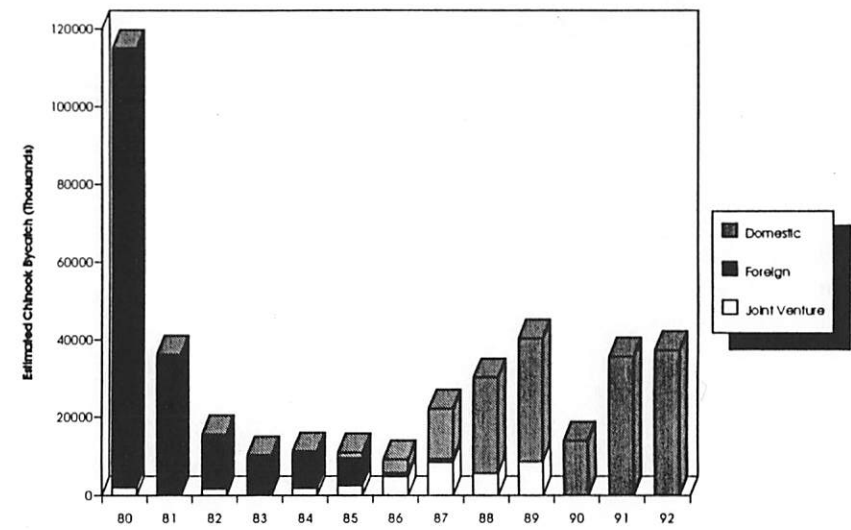
**Amendment 21b
Salmon Bycatch Management**

**Draft EA/RIR
Initial Regulatory Flexibility Analysis**

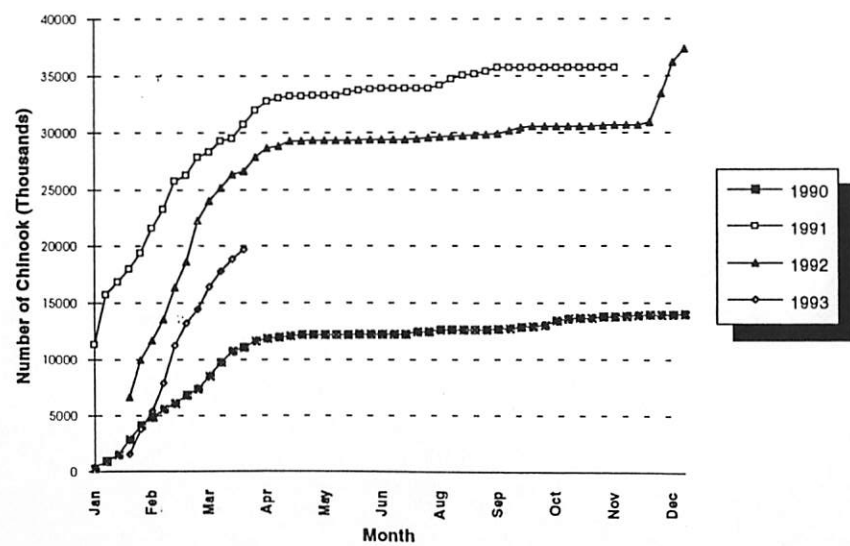
Staff of
Alaska Department of Fish and Game
Alaska Commercial Fisheries Entry Commission
North Pacific Fisheries Management Council

April, 1993

Bering Sea Chinook Salmon Bycatch



Cumulative Chinook Bycatch In the Bering Sea

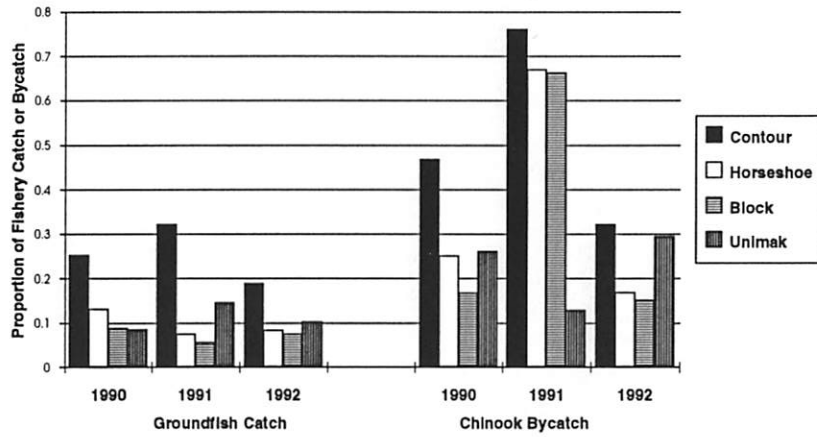


Initial Proposal

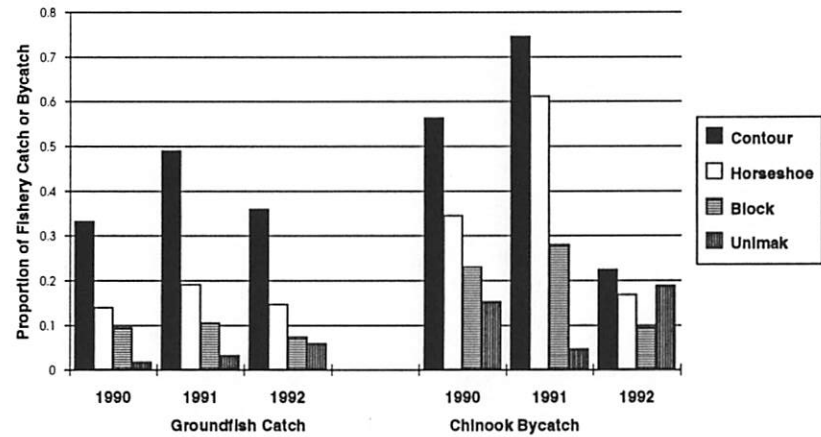
- 1) Set chinook bycatch cap in the Bering Sea based on an annual rate of 0.004 chinook / mt groundfish.
- 2) Base specific fishery caps on historic percentage of bycatch.
- 3) Enforce mandatory time / area closures when cap is attained.

<p>3</p> <p>Initial Chinook Bycatch Analysis</p> <p>1) Four cap alternatives: 0.004, 0.008, 0.012, and 0.024 chinook/mt. (approx. 8,000, 16,000, 24,000, and 48,000 chinook salmon).</p> <p>2) Four Vessel Incentive Program (VIP) alternatives: - No VIP program. - VIP program as currently exists (salmon not included). - VIP program mildly effective for salmon. - VIP program as currently exists with salmon included.</p> <p>3) Closures with three different statistical area groupings.</p> <p>4) Two time closure alternatives.</p>	<p>4</p> <p>Initial Findings</p> <p>1) Caps are effective at controlling chinook salmon bycatch.</p> <p>2) Low caps (e.g. 8,000 and 16,000 fish) result in high cost to industry.</p> <p>3) Selection of areas for closure based on historic bycatch levels can reduce cost to industry.</p> <p>4) Selection of time or length of closure based on historic bycatch patterns can reduce cost to industry.</p>
<p>5</p> <p>Request for additional analysis</p> <p>Identify and select for closure prior to inception of fisheries:</p> <p>1) Specific small areas with historic high bycatch. 2) Specific times when these areas have high bycatch.</p> <p>Run model with data which has not been averaged in order to:</p> <p>1) Maximize bycatch rates in the model. 2) Determine effects of higher bycatch caps.</p>	<p>6</p> <p>Geographical Findings</p> <p>TIME Chinook salmon bycatch is highest : January - April and September - December</p> <p>AREA Chinook salmon bycatch is highest: Near Unimak Island Along the 200 m contour (shelf break)</p>

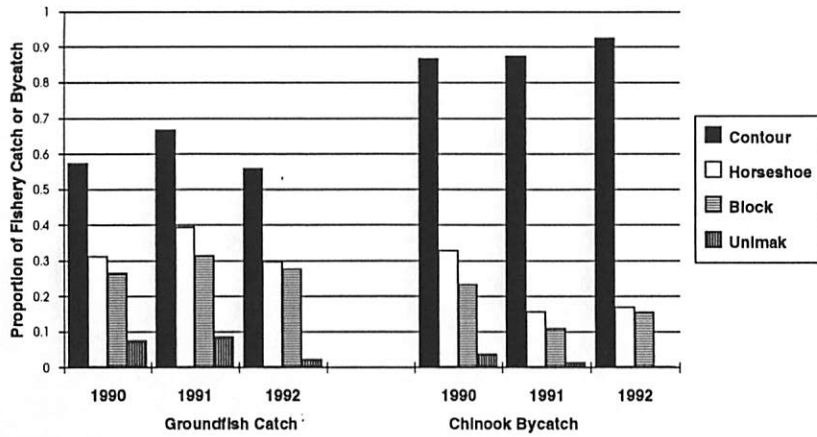
Proportion of Groundfish and Chinook In Defined Areas - Domestic Bottom Trawl for Pollock



Proportion of Catch and Bycatch In Defined Areas - Domestic Pelagic Trawl for Pollock



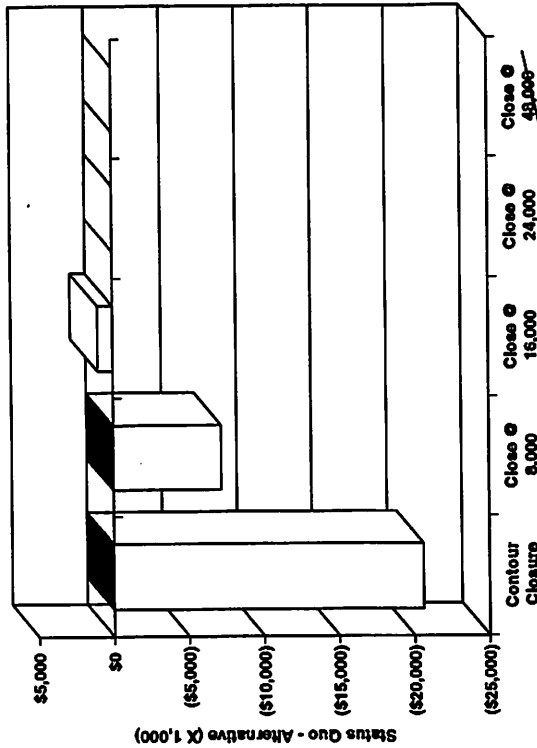
Proportion of Catch and Bycatch In Defined Areas - Domestic Bottom Trawl for Pacific Cod



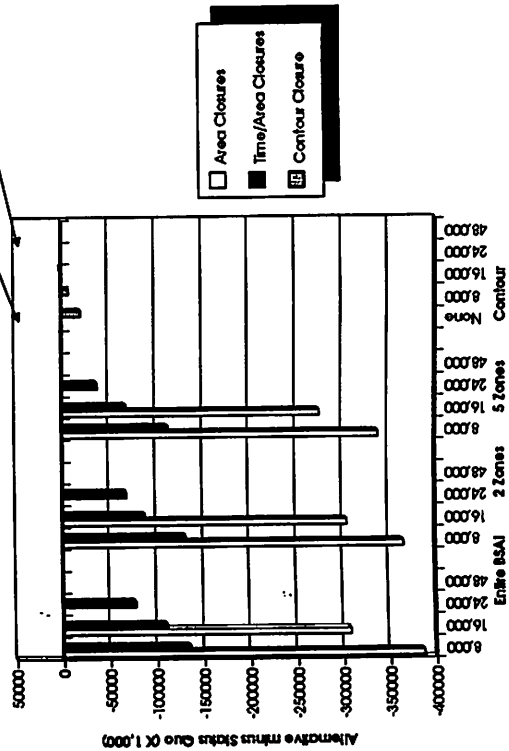
Additional Model Findings

- 1) Closure of 200 m contour and blocks above Unimak Island:
 Reduce cost to industry
 Reduce chinook bycatch
- 2) Closure of 200 m contour in conjunction with caps:
 Further minimizes cost to industry.
 Further reduces chinook bycatch.
- 3) Use of data from single years (not averaged):
 Did not greatly increase bycatch levels in the model.
 Showed that higher caps result in cost to industry.

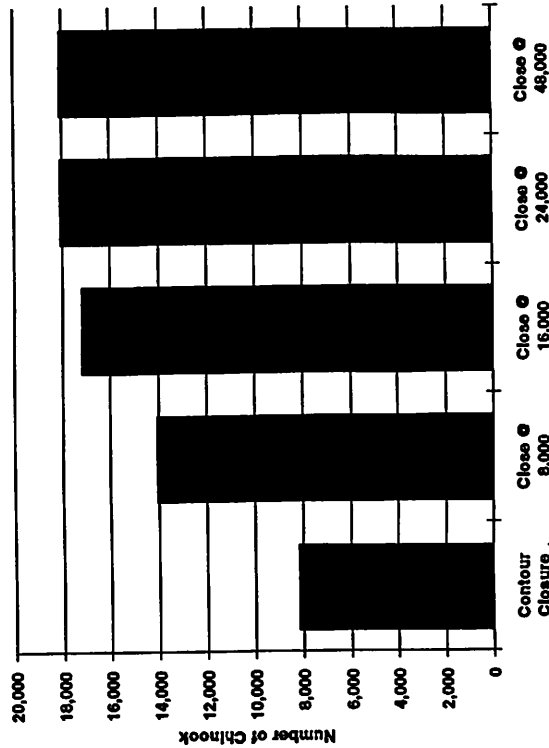
Change in total net benefits due to alternative



Net Benefits of Alternative minus Status Quo, Chinook Salmon not included in VIP program.



Number of chinook bycaught under each alternative



Final Request for Analysis

- 1) Establish the links between by-caught chinook salmon and the salmon returning to western Alaskan systems.
- 2) Examine value of chinook to recreational fishermen.

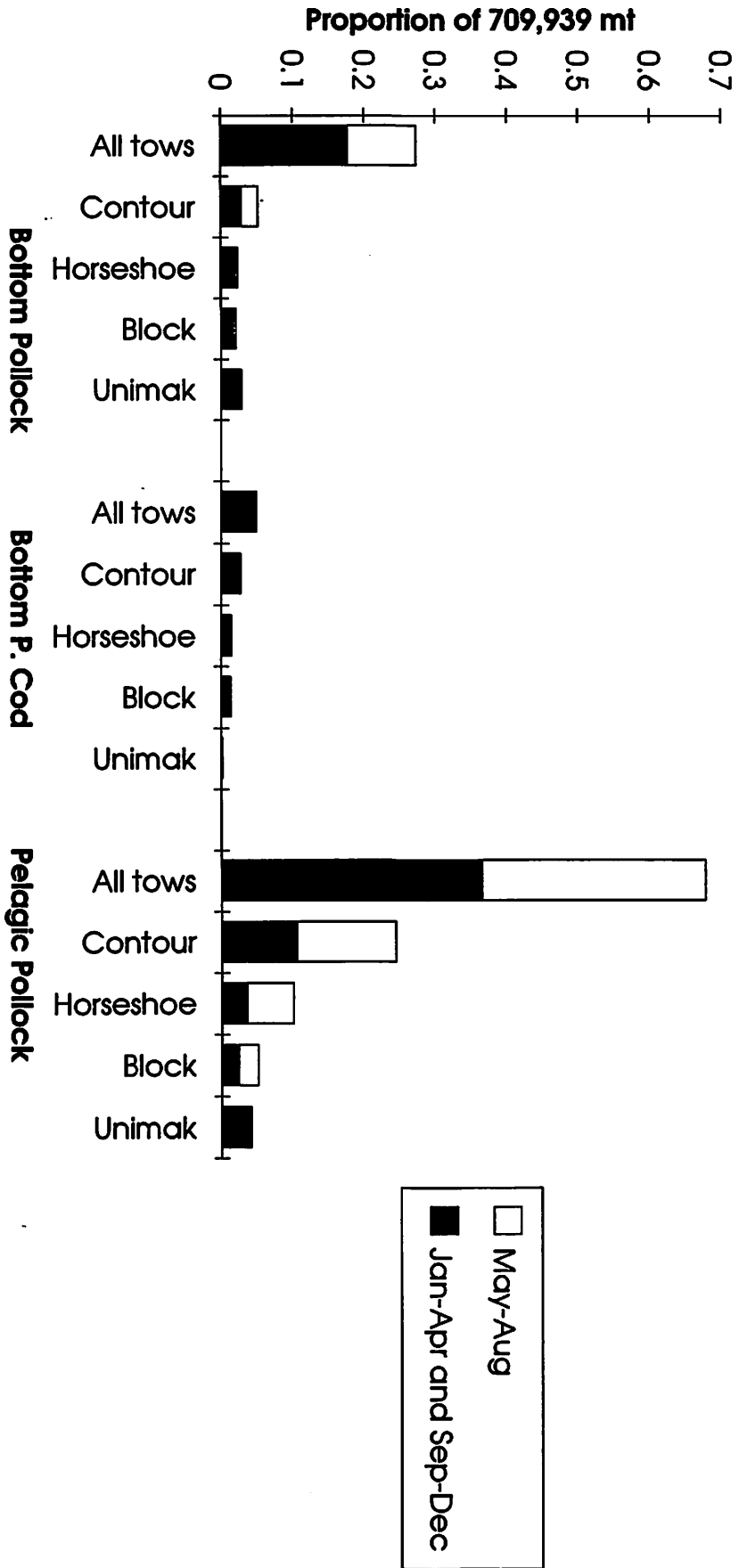
Final Additional Findings

- 1) Historic bycatch levels were compared to total returns. If not intercepted, contributions to returns would have been:
 - Between 1% and 4% of total returns to the Yukon River.
 - Between 2% and 7% of total returns to the Nushagak River.
- 2) Recreational and Subsistence values are difficult to quantify.
 - Recreational fishing is a major industry in Bristol Bay.
 - Valuation of chinook salmon to recreational and subsistence fisheries is beyond the scope of this study.

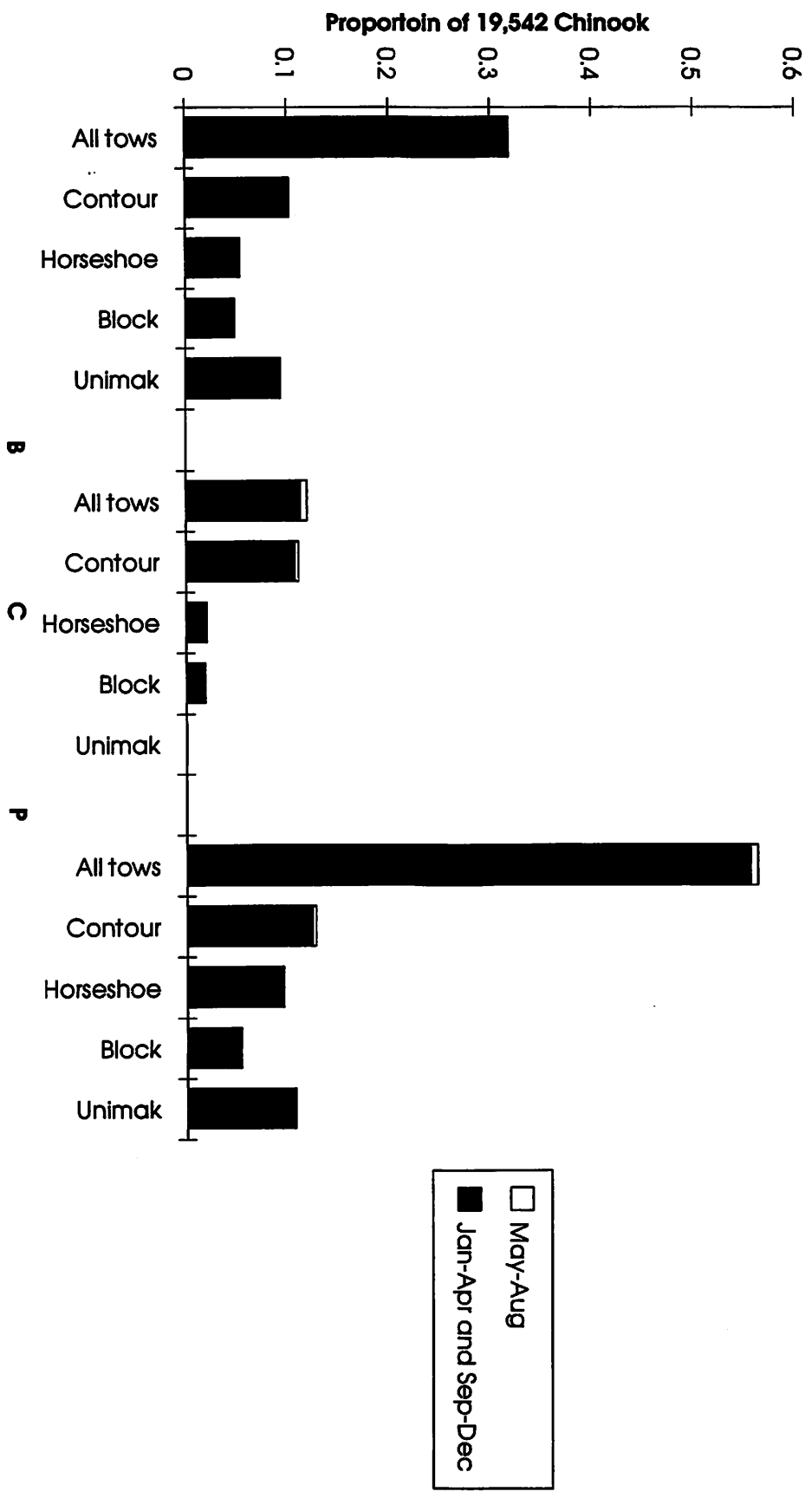
Alternatives

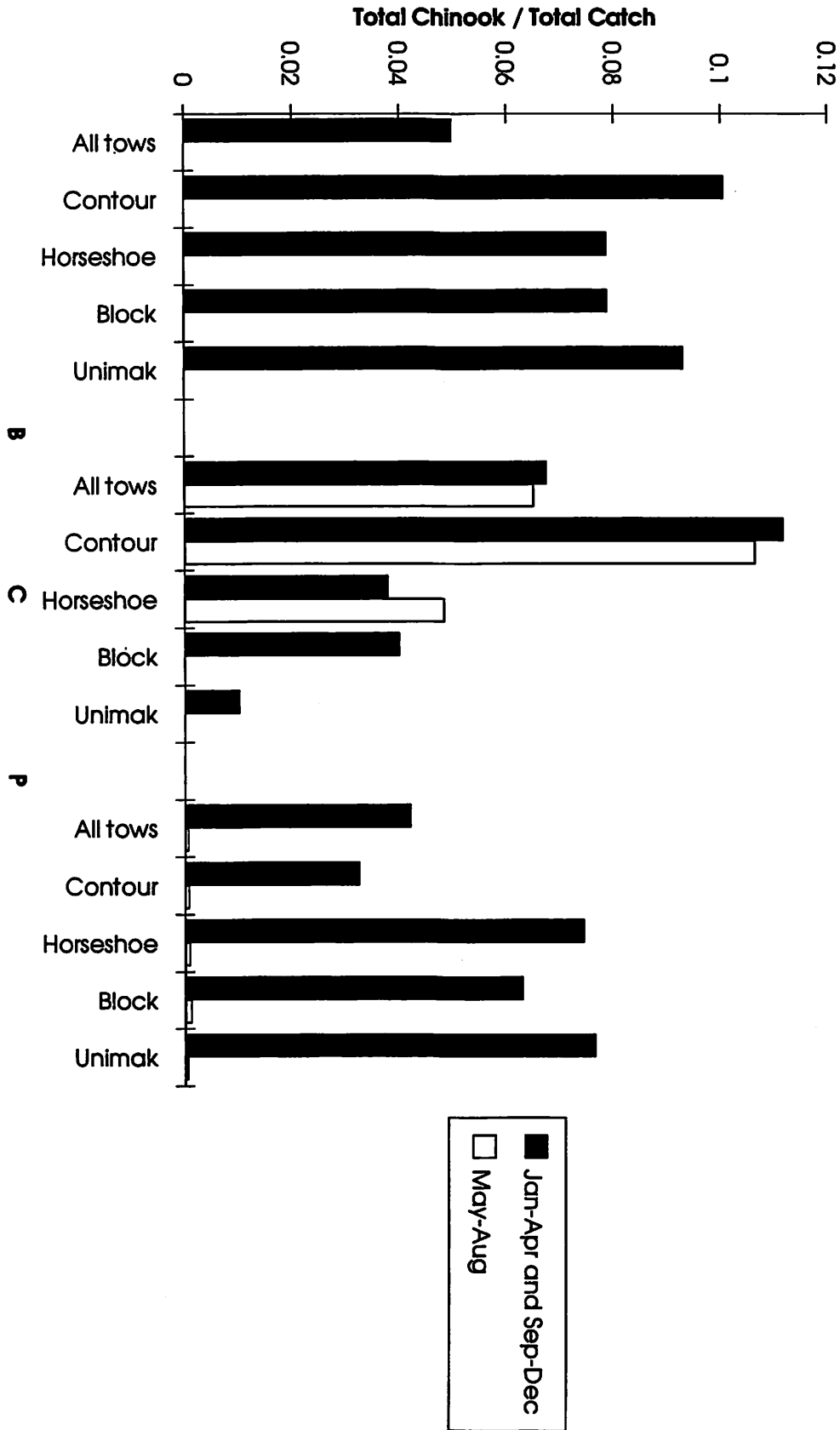
- Alternative 1. Status Quo.
- Alternative 2. Chinook Prohibited Species Caps.
 - Option 1. Close the entire BSAI
 - Option 2. Close specific statistical areas.
 - Area sub-options:
 - 1) Close 2 zones:
 - a) Areas 511, 517 and 519;
 - b) all other areas.
 - 2) Close 5 different zones:
 - a) Area 511;
 - b) Areas 517 and 519;
 - c) Area 540;
 - d) Area 519;
 - e) all other areas.
 - Time closure sub-option:
 - Close 2 separate time periods:
 - January-April;
 - May-December.
- Option 3. Close geographical areas.
- Alternative 3. Area Closures with no Caps.

Total Catch 1992 - Domestic Observed Vessels



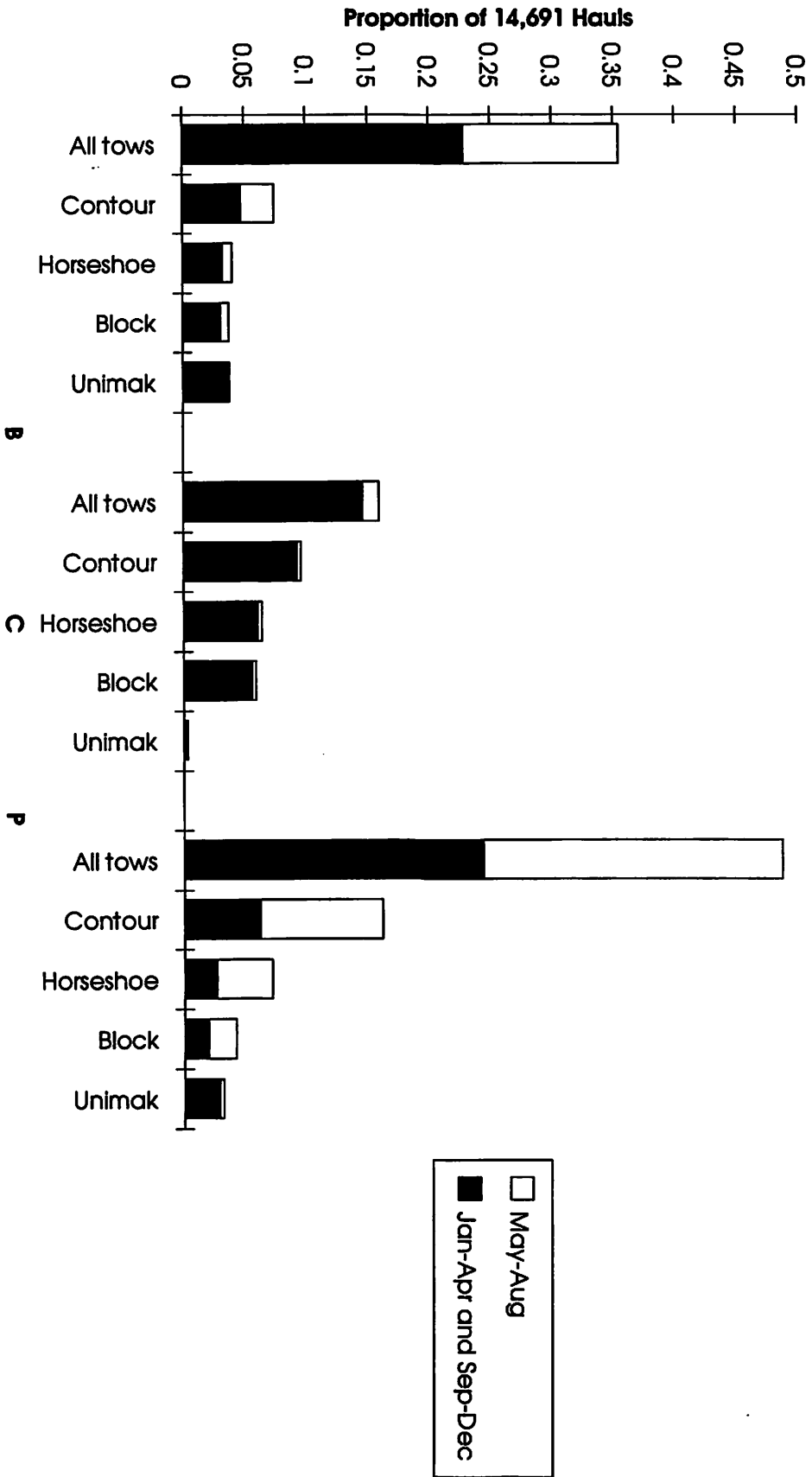
Total Chinook - 1992 Domestic Observed Vessels



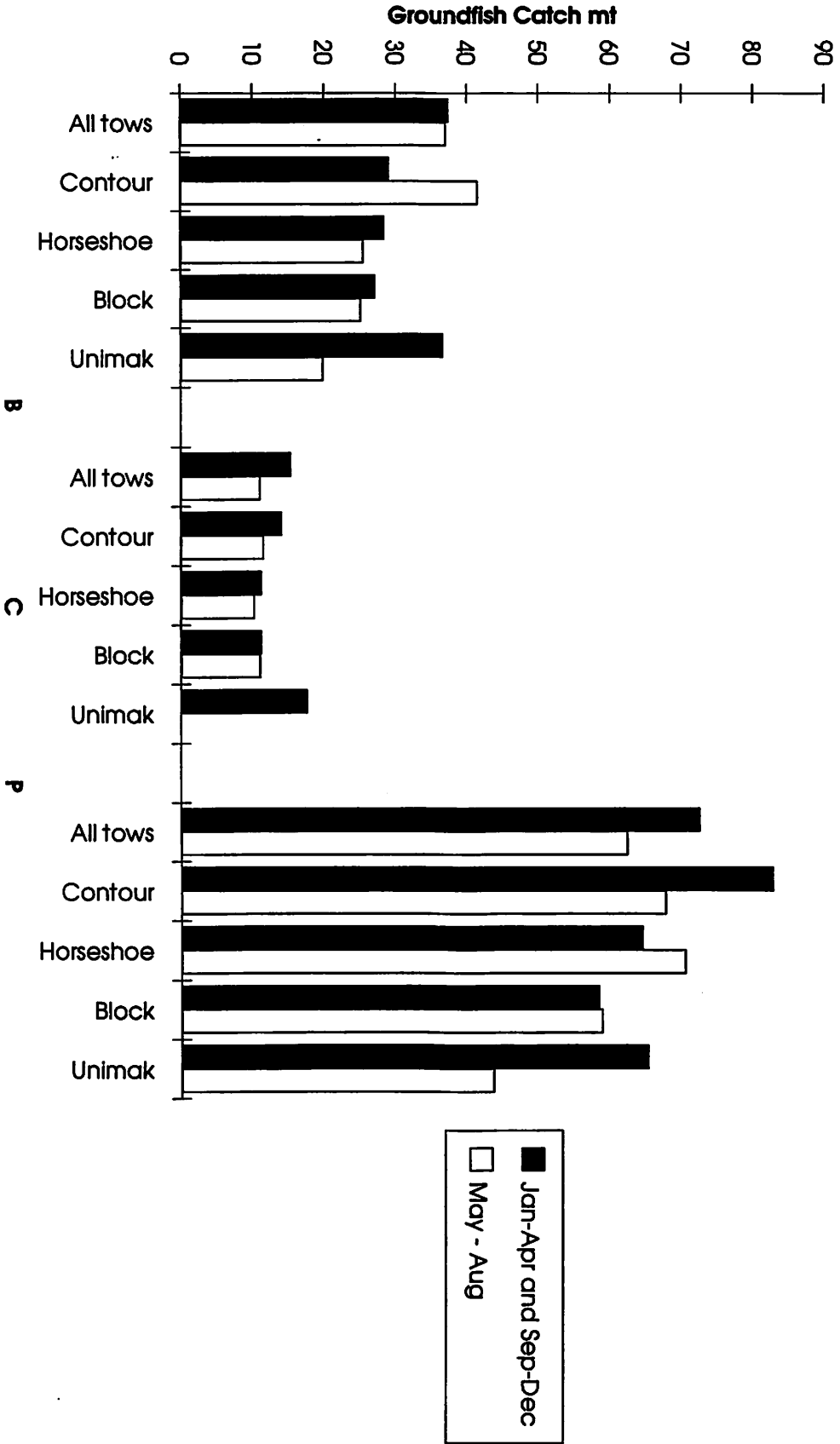


Bycatch Rates - 1992 Domestic Observed Vessels

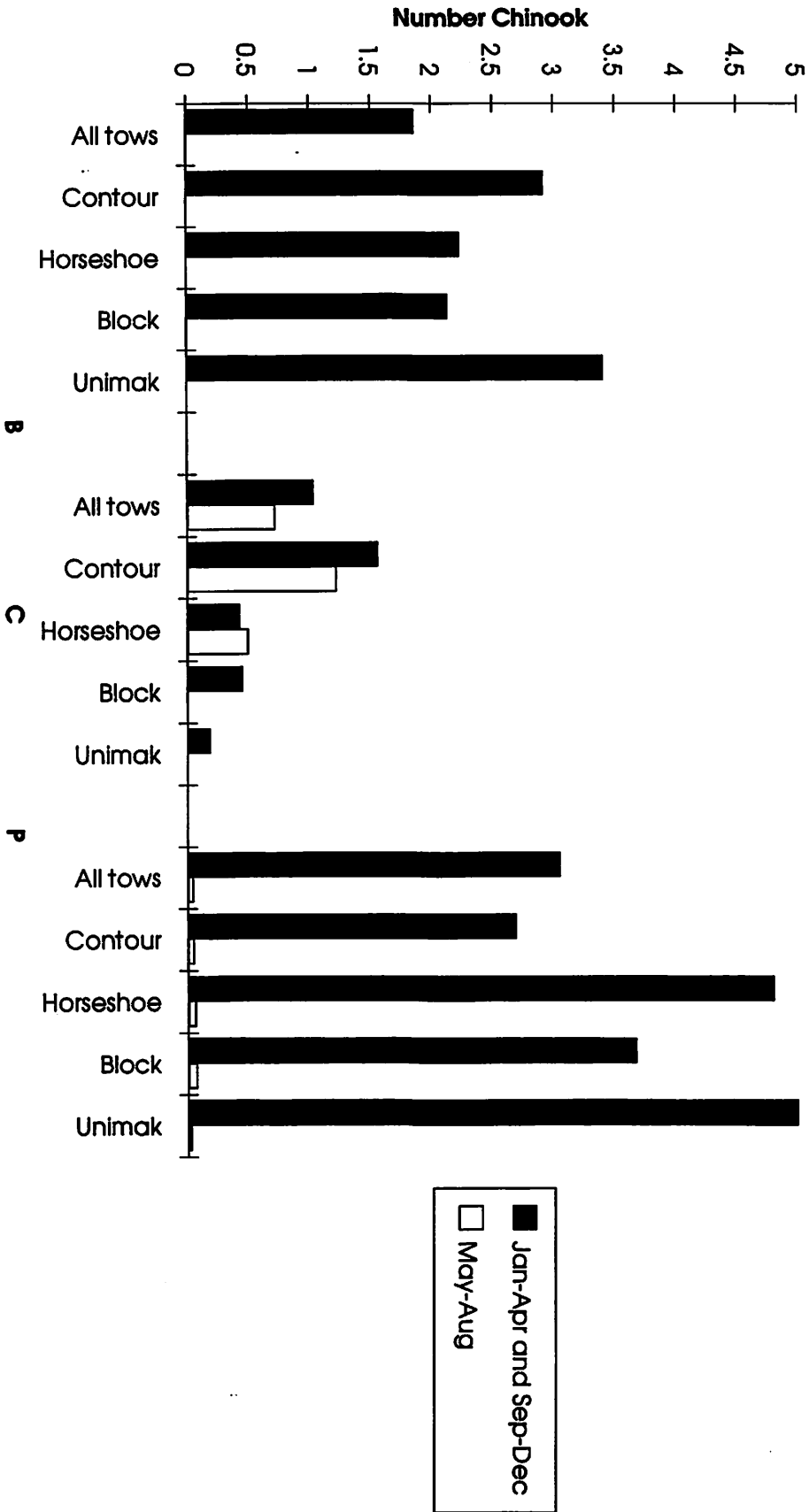
Number of Hauls - 1992 Domestic Observed Hauls



Mean Groundfish Catch - 1992 Domestic Observed Vessels



Mean Chinook Bycatch - 1992 Domestic Observed Vessels



Areas in cross-hatch are $1/2^\circ$ latitude by 1° blocks chosen to approximate a buffer around the 200 m contour. These areas have historically had high chinook bycatch. Shaded areas also had high chinook bycatch in 1992 based on preliminary observer data.

