

MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke  
Executive Director



ESTIMATED TIME  
5 HOURS

DATE: December 30, 1994

SUBJECT: Salmon Bycatch

**ACTION REQUIRED**

- (a) Receive report from Salmon Foundation on "B" season activities.
- (b) Take final action on amendment to reduce chum salmon bycatch.

**BACKGROUND**

Progress of the Salmon Foundation

Among the provisions of the Council's salmon bycatch control policy is the endorsement of the Salmon Research Foundation, a non-profit corporation. The purpose of the Foundation is to use income generated from salmon bycatch assessment payments to develop a salmon bycatch avoidance program for the BSAI trawl fisheries, and to fund research on stock origin of salmon taken as bycatch. In September, the Council received a report on recent Foundation activities, including a review of fleet participation and assessment collection, results of the pollock "B" season bycatch avoidance program, and Foundation development. The Foundation will provide an update of its activities at this meeting.

Chum Salmon Bycatch Reduction Analysis

Salmon bycatch controls originally were part of Amendment 21 to the BSAI FMP. In April 1992, the Council reviewed a draft document and requested additional analysis. A revised analysis, which included time and area patterns in chinook bycatch, was reviewed in January 1993. Further revisions were made and the document was reviewed in April 1993. Although the analysis was released for public review, no action was taken in part due to the development of the Salmon Foundation. In April 1994, the Council reviewed a discussion paper on alternatives to reduce bycatch of "other" salmon (mostly chums) in the BSAI trawl fisheries. The Council requested an Emergency Rule to be in place for the 1994 pollock "B" season that would close five 30-mile by 30-mile blocks within the CVOA (an option analyzed in the discussion paper) to all trawling when 42,000 other salmon were taken as bycatch. In September, analysis of salmon bycatch reduction measures was broken out into two separate documents, with one addressing chum salmon bycatch, and the other addressing chinook bycatch. Both were released for public review. Final Action on the chum salmon analysis can be taken at this meeting; review of chinook salmon bycatch reduction measures will take place in April 1995.

The chum salmon bycatch analysis was released for public review on December 14, 1994. The purpose of this analysis is to provide information needed to take possible action to reduce "other" (chum) salmon bycatch. The objectives of this proposed amendment are to, (1) provide a mechanism by which to accurately assess and reduce excessive "other" salmon bycatch in the BSAI groundfish fisheries, (2) do so with the smallest possible adverse impact on the domestic groundfish harvesting and processing industry, and (3) assure that any action is balanced and equitable to all segments of the industry. Three alternatives were examined, and briefly these were:

Alternative 1. Status quo. NMFS would not have the authority to close areas of the BSAI to trawling to prevent high bycatch of "other" salmon.

Alternative 2. A specified area of the BSAI (depending upon the closure option selected) would be closed to all trawling year-round.

Alternative 3. A specified area of the BSAI (depending upon the closure option selected) would be closed to trawling during the period of high "other" salmon bycatch (generally July through October). An option to this alternative would be to close specified areas when a bycatch limit is reached.

There are seven different options for closed areas under both alternative 2 and alternative 3. These are essentially the areas described in the previous discussion paper. An executive summary, along with selected figures, is provided as agenda Item D-2(c)(1).

The Council can review the draft EA/RIR for adequacy, receive public testimony on this issue, and take final action at this meeting. If final action is taken at this meeting, implementation could occur in mid-1995.

Update: The 5 block area in the CVOA was closed to vessels using trawl gear on August 20, 1994, when bycatch of 42,000 "other" salmon was reached. As of December 10, 1994, bycatch in BSAI trawl fisheries totalled 96,402 "other" salmon. An additional 40,482 "other" salmon have been taken as bycatch in GOA trawl fisheries (through 11/5/94). These are compared to bycatches for the last few years in the table below:

	<u>BSAI</u>		<u>GOA</u>	
	<u>chinook</u>	<u>other</u>	<u>chinook</u>	<u>other</u>
1991	35,776	31,987	37,592	13,288
1992	37,372	38,919	15,694	10,126
1993	46,483	240,776	19,193	85,834
1994	44,088	96,402	13,990	40,482

**DRAFT FOR PUBLIC REVIEW**

**Environmental Assessment/Regulatory Impact Review/  
Initial Regulatory Flexibility Analysis**

for

**CHUM SALMON BYCATCH IN THE BERING SEA TRAWL FISHERIES  
AND ALTERNATIVES FOR CLOSURE AREAS**

Prepared by

**Alaska Department of Fish and Game  
National Marine Fisheries Service**

December 1, 1994

## EXECUTIVE SUMMARY

"Other" salmon bycatch in the 1993 BSAI mid-water trawl fisheries, comprised mostly of chums, was significantly higher than in any prior year on record. Historically most of the chum salmon bycatch occurs in an area coincidental with the Catcher Vessel Operational Area (CVOA) during the period which coincides with the pollock 'B' season. The high bycatch caused concern from a management standpoint because there are currently no options available for controlling the bycatch of salmon which are a prohibited species. However, because of this high bycatch the Council took emergency action in April of 1994 to close an area identified as having historically high chum salmon bycatch after a pre-defined cap was attained. This EA/RIR/IRFA contains an analysis of the potential impacts of a range of time and area closure alternatives to control "other" salmon bycatch in BSAI groundfish trawl fisheries.

Specifically, this document examines three management alternatives (and presents one Alternative 4 that is not analyzed in this document, see below), and a total of nine closure options (seven options and two suboptions). These include the Status Quo as Alternative 1, and two additional alternatives requiring either year-round or partial-year area closures which could potentially reduce the "other" salmon bycatch especially in the CVOA. Options for "other" salmon bycatch management in this document define areas for closure based upon existing management areas coincidental with high "other" salmon bycatch, as well as discrete areas within larger management areas. This document also outlines two associated factors that, under Alternative 3, are necessary to monitor the "other" salmon bycatch. These include: 1) extra observer coverage on motherships that receive groundfish harvested in the CVOA during the pollock 'B' season and, 2) electronic communication capabilities on affected motherships and shoreside processors with 100 percent observer coverage that receive groundfish harvested in the CVOA during the pollock 'B' season.

In 1993, the "other" salmon bycatch in the Bering Sea and Aleutian Islands management area (BSAI) was approximately 245,000 salmon. This was more than triple the previous high bycatch level, and six times the bycatch level seen in the previous two years. The vast majority of these "other" salmon were assumed to be chums. Conservatively, the historical species composition of "other" salmon bycaught in the BSAI groundfish fisheries is approximately 95% chum salmon in any given year.

Concerns about chum salmon bycatch were exacerbated by the poor returns to Western Alaskan systems in the same year. Commercial, subsistence, and recreational fisheries were closed in several of the Western Alaskan districts in 1993 because of poor returns, and projections for 1994 were for "below average returns" in many of these districts, as well. However, Western Alaskan chum salmon runs were average or above average in number during 1994.

The chum salmon intercepted in the BSAI groundfish fisheries in 1993 were primarily in the size range of 3 year-old fish which would have been expected to mature in 1994 and 1995. The majority of the 1993 chum salmon bycatch occurred after most of the Western Alaskan chum salmon would have returned to their native systems. Little is known about the potential impacts bycatch may have had on returns in 1994 and subsequent years, especially since source of origin stock composition of the bycaught "other" salmon is unknown.

The purpose of this analysis is to provide information needed to take possible action to reduce "other" salmon bycatch. An Emergency Rule (ER), patterned on one of the alternatives and one of the closure options was in place for the 1994 pollock 'B' season. That ER will expire prior to the 1995 fishing season. If the Secretary is to have the management authority to address future "other" salmon bycatch problems in the BSAI trawl fisheries, it will be necessary for the Council to adopt an amendment to the BSAI Groundfish Management Plan, prior to the start of the 1995 pollock 'B' season on August 15.

This analysis examines the domestic groundfish trawl fisheries in 1990 through 1993 for patterns in "other" salmon bycatch. It is important to note, however, that only the fisheries conducted in 1993 were in spatial and temporal patterns similar to those anticipated in the future, given prevailing management regulations. This is so because of recent changes in regulations governing the timing of the pollock 'B' season (August 15 opening date, as of 1993), and the establishment of the CVOA (effective June 1, 1992). The smallest unit examined for potential closure in this document was the 1/2° latitude by 1° longitude block.

Given the intra-annual and inter-annual variability in spatial distribution of observations of relatively high bycatch, as well as the substantial mobility of both pollock stocks and salmon in these areas of the BSAI, a trade-off between potential groundfish catch and potential salmon bycatch savings becomes apparent, though difficult to quantify. That is, either large areas may be selected for closure to ensure larger potential "other" salmon bycatch savings, or small areas may be chosen in order to reduce closure impacts on existing groundfish fisheries.

The specific objectives of this FMP amendment are to, 1) provide a mechanism by which to accurately assess and reduce excessive "other" (chum) salmon bycatch in the BSAI groundfish fisheries, 2) achieve a given bycatch reduction with the smallest possible adverse impact on the domestic groundfish harvesting and processing industry, and 3) assure that any action is balanced and equitable to all segments of the industry.

Four alternatives, seven options, and two sub-options for time/area closures were considered. They include:

**Alternative 1: Status quo.** Under the status quo, no regulatory authority would exist for NMFS (on behalf of the Secretary) to close areas of the BSAI to trawling to prevent large numbers of "other" salmon from being taken as bycatch in the groundfish fisheries.

**Alternative 2:** A specific area (depending upon the closure option selected) of the BSAI would be closed to all trawling from January 1 through December 31. This alternative would potentially reduce "other" salmon bycatch, but might be considered to be too restrictive to the affected trawl industry, because it would eliminate all trawling within a specified area for the entire calendar year, whereas "other" salmon bycatch could be a problem only during a portion of the year.

**Alternative 3:** A specified area of the BSAI (depending upon the closure option selected) would be closed to all trawling during the period of high "other" salmon bycatch. This alternative could be implemented with the adoption of a cap, such as the 42,000 other salmon selected by the Council in April of 1994. This alternative is less restrictive than Alternative 2 because it would close a specified area due to "other" salmon bycatch for only a portion of the year, possibly only after a bycatch limit has been reached in the CVOA. The bycatch limit of 42,000 salmon adopted in 1994 represents 50 percent of the 1991, 1992, and 1993 average of "other" salmon caught in the CVOA (which historically has accounted for 80% of the "other" salmon bycatch in any given year). Under this alternative the Council has the option of choosing another number for the cap.

The adoption of Alternative 3 in concert with a cap requires additional observer coverage on motherships that receive groundfish caught in the CVOA during the pollock 'B' season so that the bycatch numbers can be accurately determined and transmitted daily. It would also require the affected motherships and shoreside processors subject to 100 percent observer coverage and receiving groundfish harvested in the CVOA during the pollock 'B' season, to have the necessary hardware and software available for the observers to transmit salmon bycatch data electronically on a daily basis. Both of these requirements were implemented for the 1994 pollock "B" season under emergency rulemaking.

**Alternative 4: Change the 'B' season starting date. An alternative to avoid other salmon bycatch would be to move the start of the 'B' season back to June 1. The EA/RIR/FRFA that was originally prepared for the change in the 'B' season start date analyzes the impact and no further discussion is presented in this document (EA/RIR/FRFA for the Delay of the Pollock 'B' season in the Bering Sea and Aleutian Islands, April 27, 1993).**

**The seven options, and two sub-options, for area closures identified under both Alternative 2 and Alternative 3 are identified below:**

**Option 1: "The Contour". A 15 mile buffer extending to either side of the 200 meter (m) depth contour which extends to the north and west from the "horseshoe" and Unimak Island (Figure 1). This contour buffer was found to correspond to high chinook salmon bycatch, as presented in Amendment 21b to the BSAI Groundfish FMP.**

**Sub-option 1b: "The Contour within the CVOA". That portion of the contour, identified in Option 1, which lies within the CVOA, as described in Option 3.**

**Option 2: "The Contour plus Unimak". The area defined under Option 1 above, plus two 1/2 degree by 1 degree blocks to the north of Unimak Island and the "horseshoe" (Figure 1). The combination of these blocks with the contour buffer accounted for a high percentage of chinook bycatch in Amendment 21b.**

**Sub-option 2b: "The Contour within CVOA plus Unimak". The portion of Option 2 lying within the CVOA as described in Option 3.**

**Option 3: "The CVOA". The Catcher Vessel Operational Area (CVOA), as currently described for management of inshore and offshore fisheries during the pollock 'B' season (Figure 2).**

**Option 4: "Area 517". NMFS management area 517 (Figure 3).**

**Option 5: "9 blocks". The nine blocks which form the top portion of the CVOA extending to the west from Unimak Island, and including a block above the northwest corner of the CVOA (Figure 4).**

**Option 6: "7 blocks". The seven blocks identical to those described in Option 5 with the two above Unimak Island deleted (Figure 5).**

**Option 7: "5 blocks". The five blocks approximating the north-central portion of the CVOA (Figure 6). This area closure was implemented under the 1994 emergency rule.**

**The management "alternative/option" combination that is least exclusive (i.e., impacts the smallest possible area), while assuring equitable and balanced treatment for all segments of the groundfish trawl fishery, and yet offers some protection to "other" salmon is Alternative 3, Option 7.**

Table 1.

Bering Sea trawl "other" salmon bycatch statistics for 1992-1994. Note that 1994 estimates are actual counts after August 13, 1994.

## Bering Sea Trawl "Other Salmon" Bycatch Statistics for 1992 - 1994

	Trawl "Other Salmon" Bycatch		Trawl "Other Salmon" Bycatch Rate (salmon/rmt of groundfish)		
	Annual Total	"B" Season Total	"B" Season Rate	Rate Jun 1 - Aug 15	Rate After Aug 15
<b>1992</b> "B" Season = Jun 1	41,345	36,320	0.05	0.02	0.08
<b>1993</b> "B" Season = Aug 15	243,261	229,699	0.30		
<b>1994</b> "B" Season = Aug 15	75,908*	51,565*	0.08		
<b>1994 "Other Salmon" Statistics</b>					
CVOA	61,686*	49,567*	0.35		
SALMON SAVINGS AREA	n.a.	6,723	1.12		
NON-CVOA	14,222*	7,998*	0.03		

\* 1994 Bycatch Statistics (except Salmon Savings Area) are projections based on data through August 27, 1994.

Figure 1. Bering Sea with 200 m depth contour portrayed as a dashed line. A buffer extends 15 mi on each side of the contour. The two 1/2° latitude by 1° longitude "Unimak blocks" are blackened.

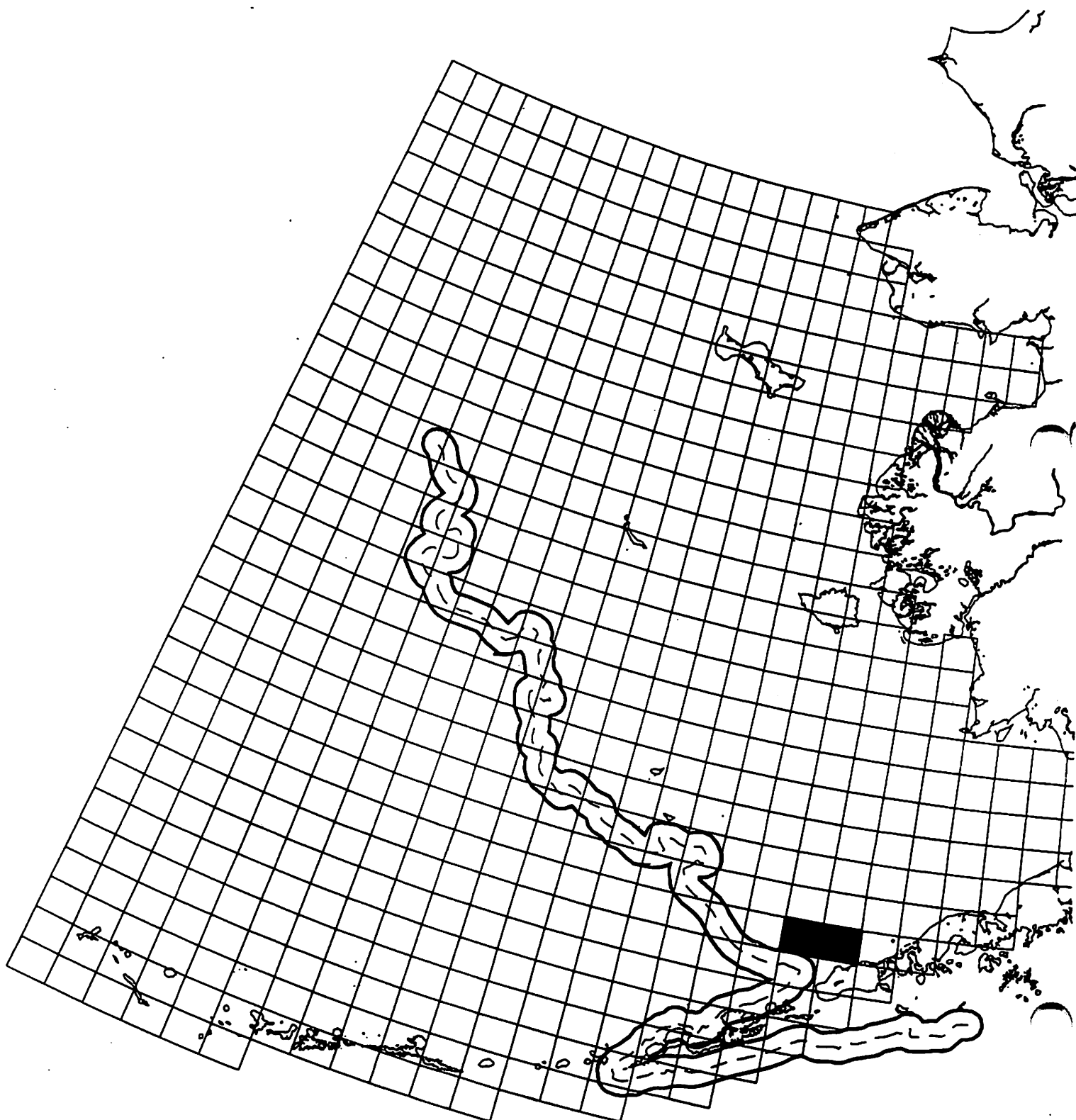




Figure 2. The location of the catcher-boat operational area (CVOA) in the Bering Sea. Northern boundary is 56° N latitude, western boundary is 168° W longitude, and eastern boundary is 163° W longitude.

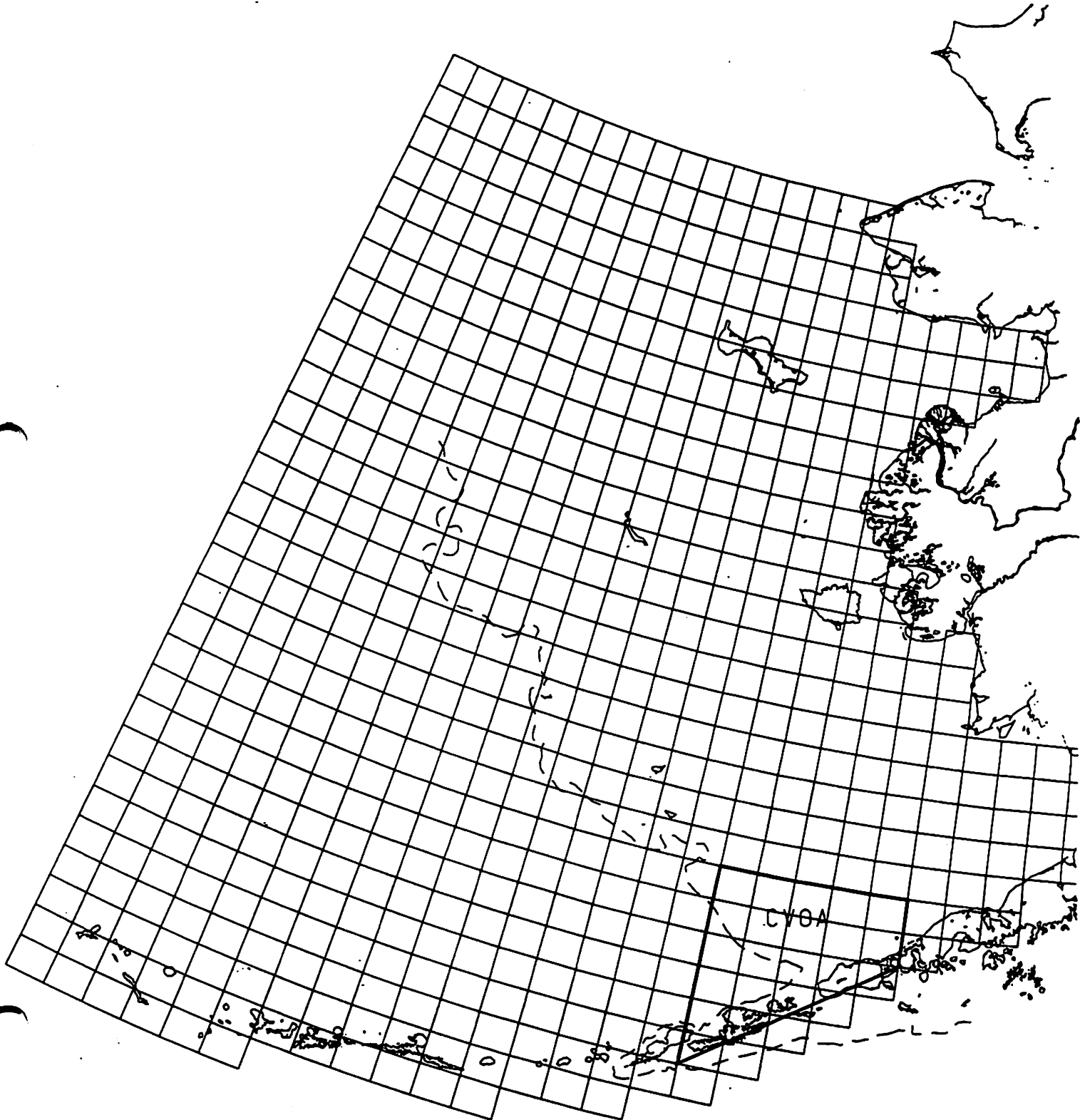


Figure 3. NMFS management areas with Area 517 highlighted.

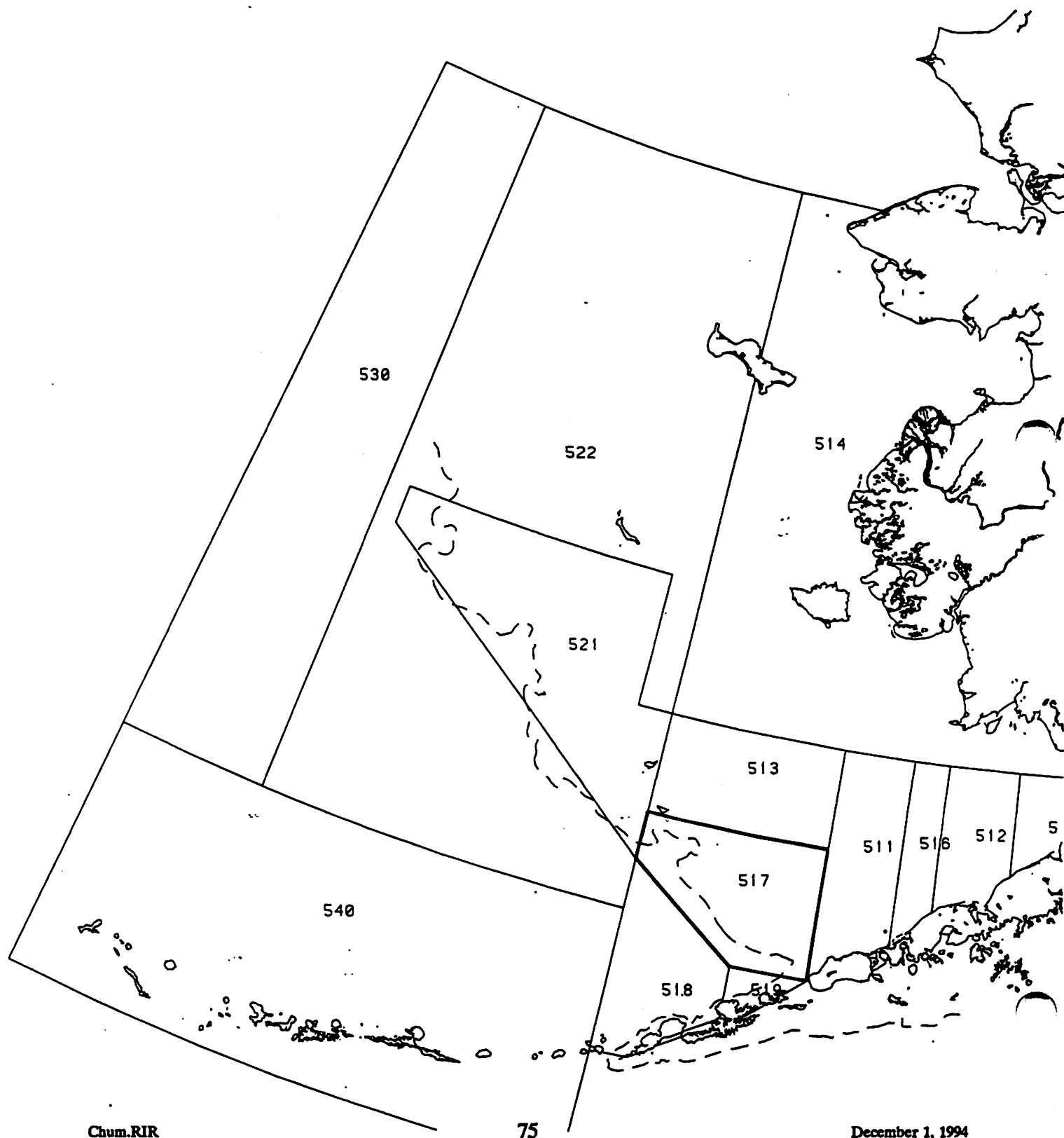


Figure 4. 9-Block option shaded, CVOA highlighted.

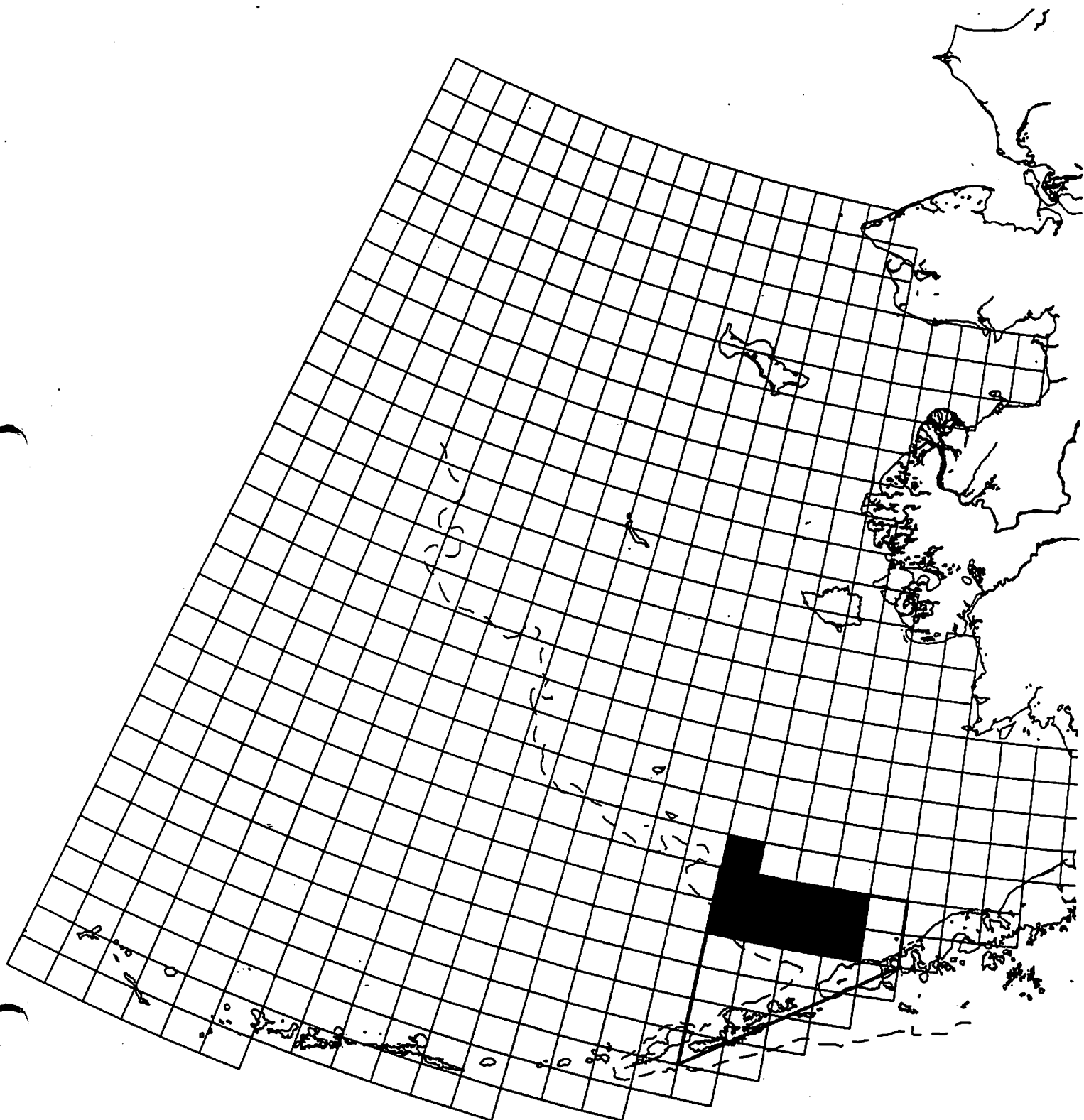


Figure 5. 7-Block option shaded, CVOA highlighted.

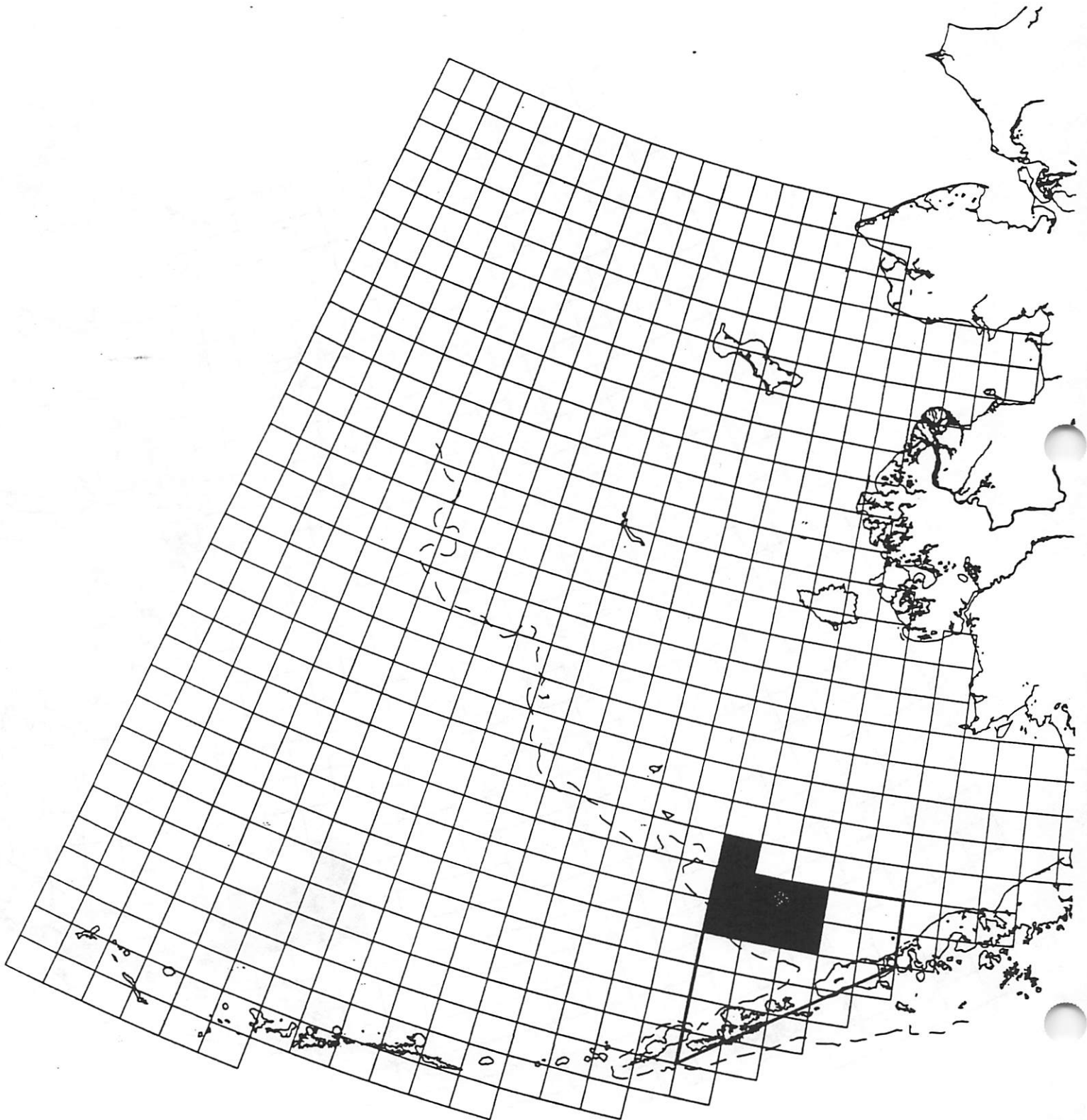


Figure 6. 5-Block option shaded, CVOA highlighted.

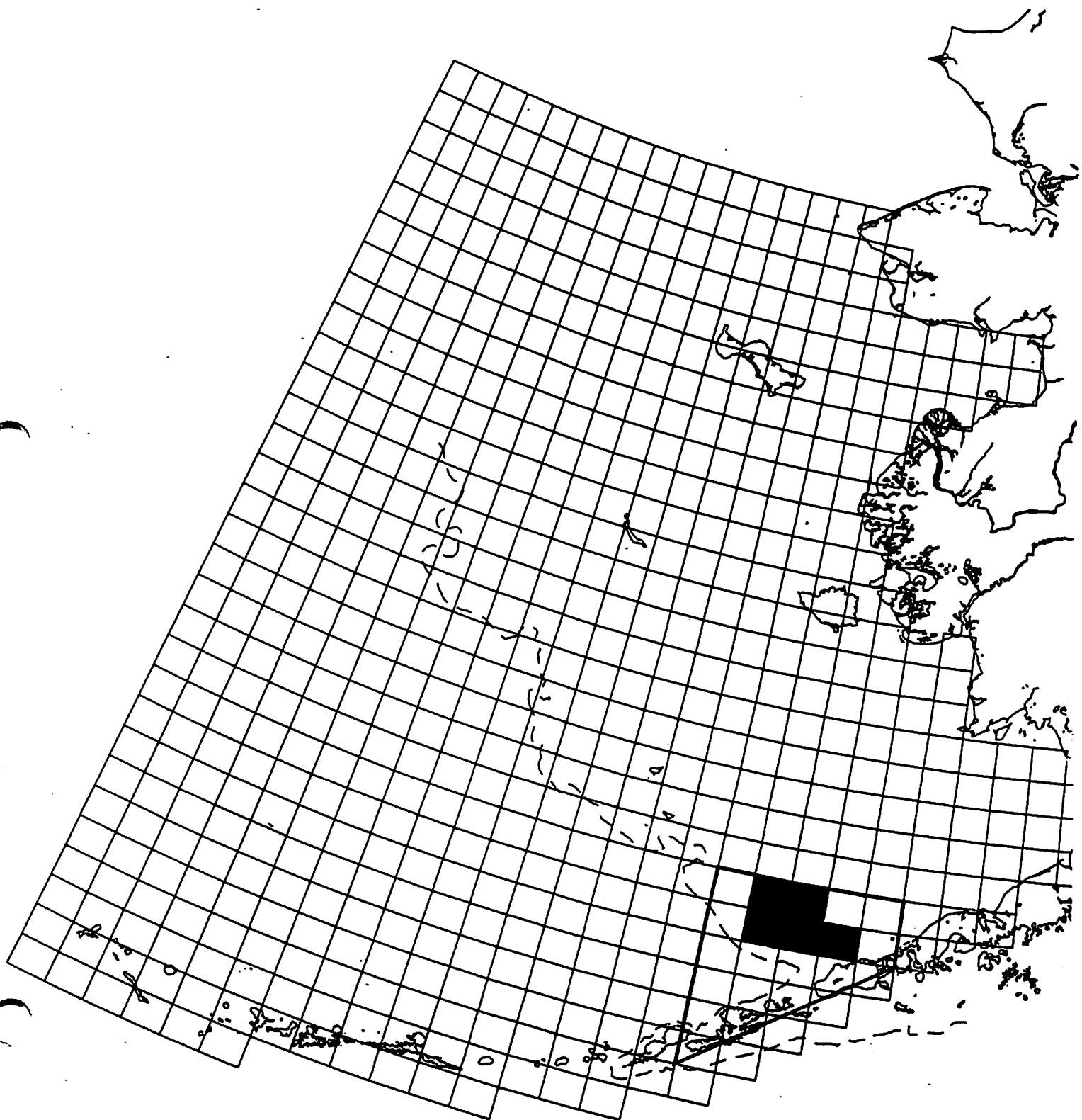


Figure 15. Total estimated bycatch of chum/other salmon from NMFS observer reports. Foreign and JV fisheries predominate in 1980-1989, and domestic fisheries are represented in 1990-1994 (as of 9/15/94).

Chum salmon bycatch from foreign and joint venture (1977-1989) and domestic (1990-1994 (9/10/94)) groundfish fisheries

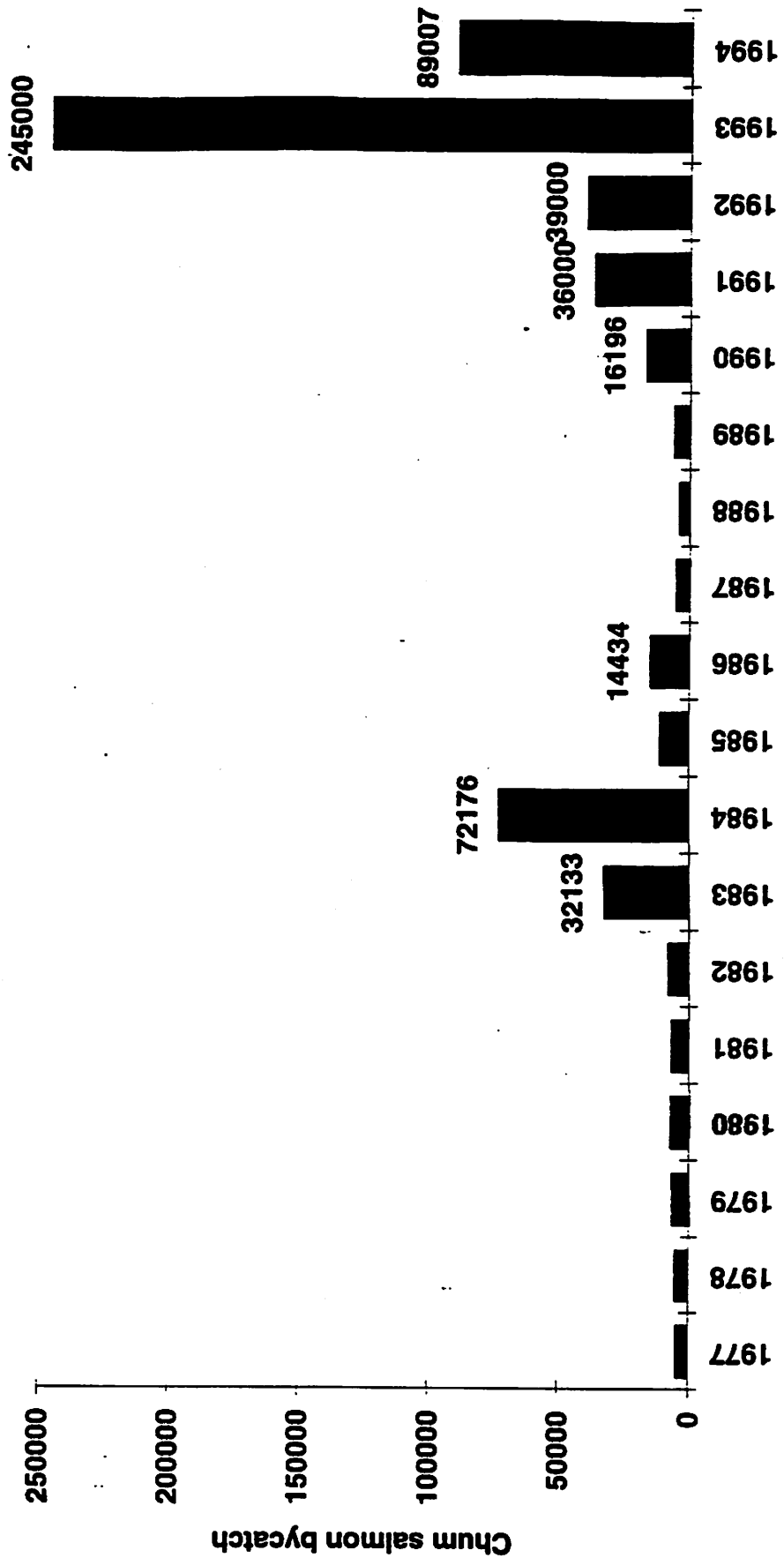


Figure 16. Top: Percentage of annual other salmon bycatch by month from observed hauls only 1990-1993. Bottom: Mean other salmon bycatch rate as per vessel bycatch per metric ton of groundfish catch.

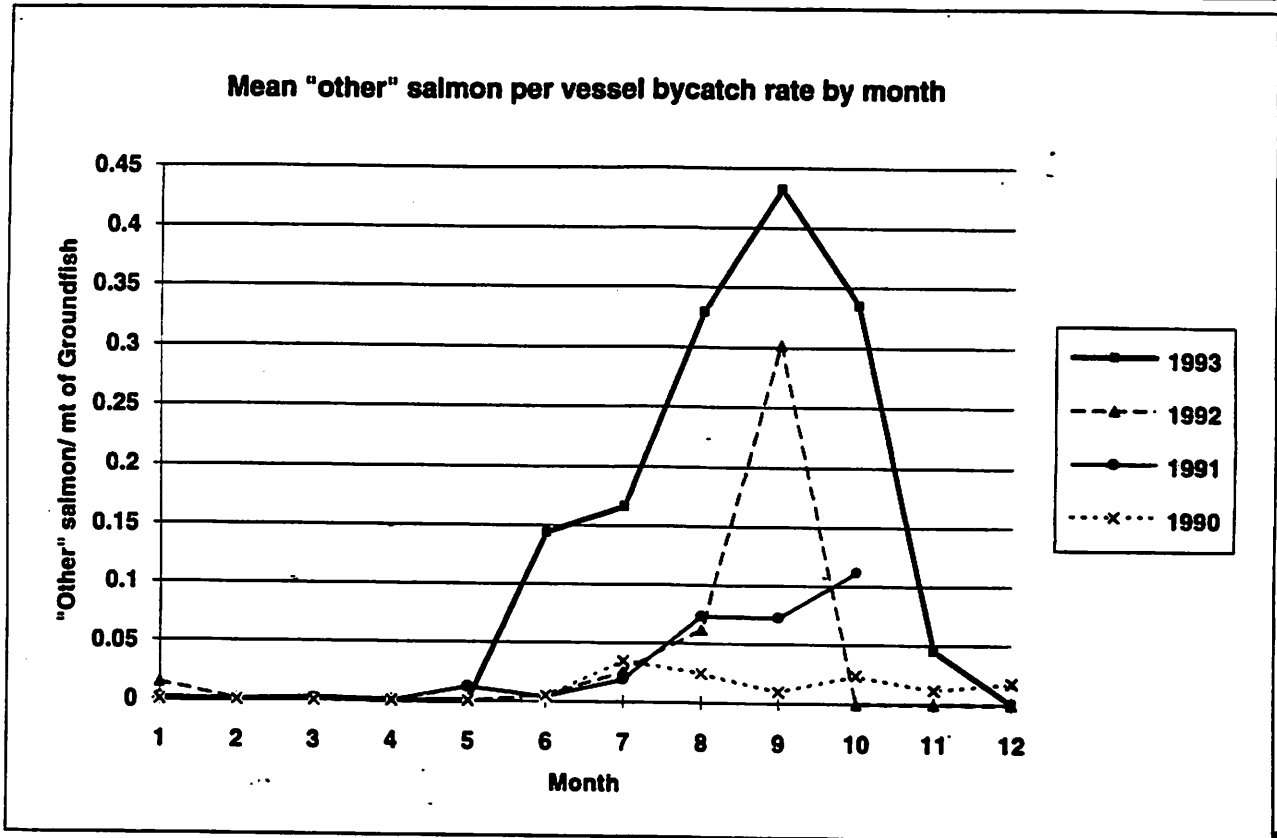
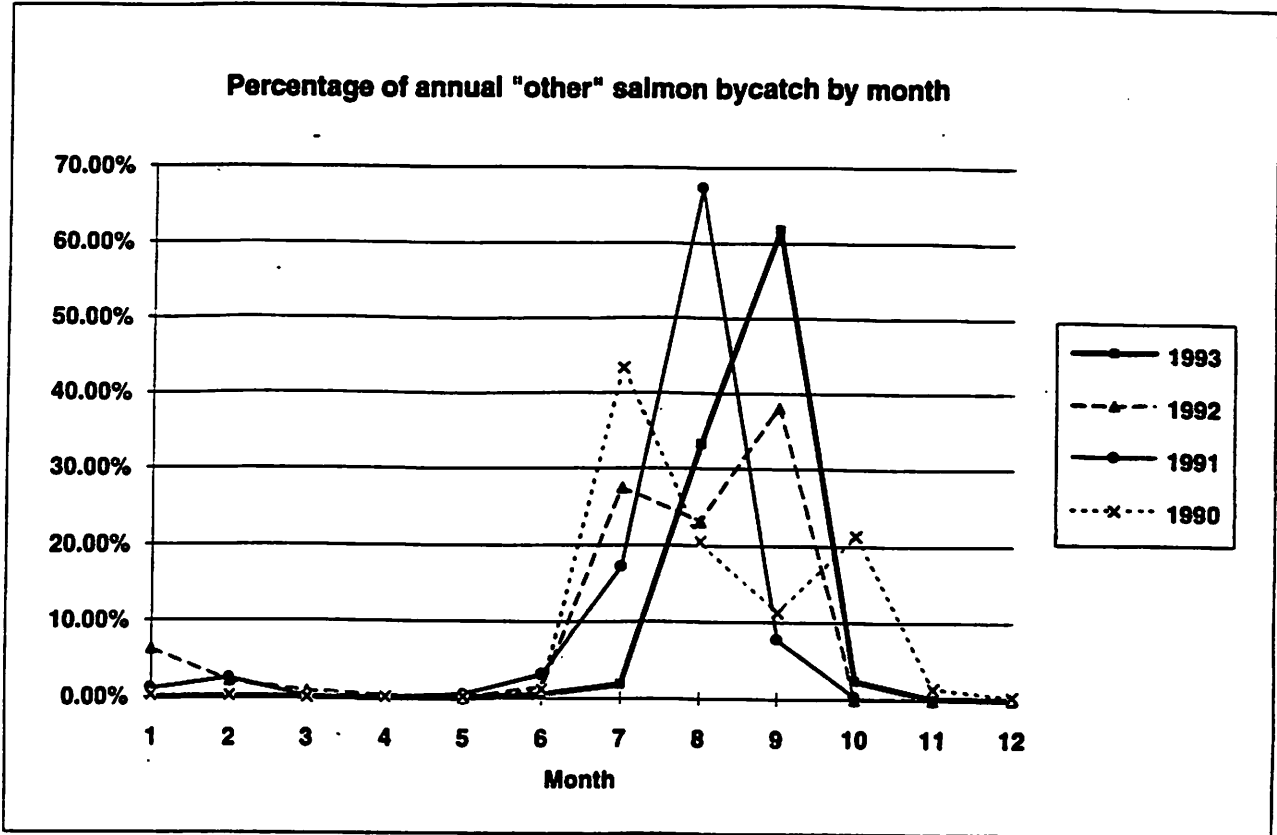
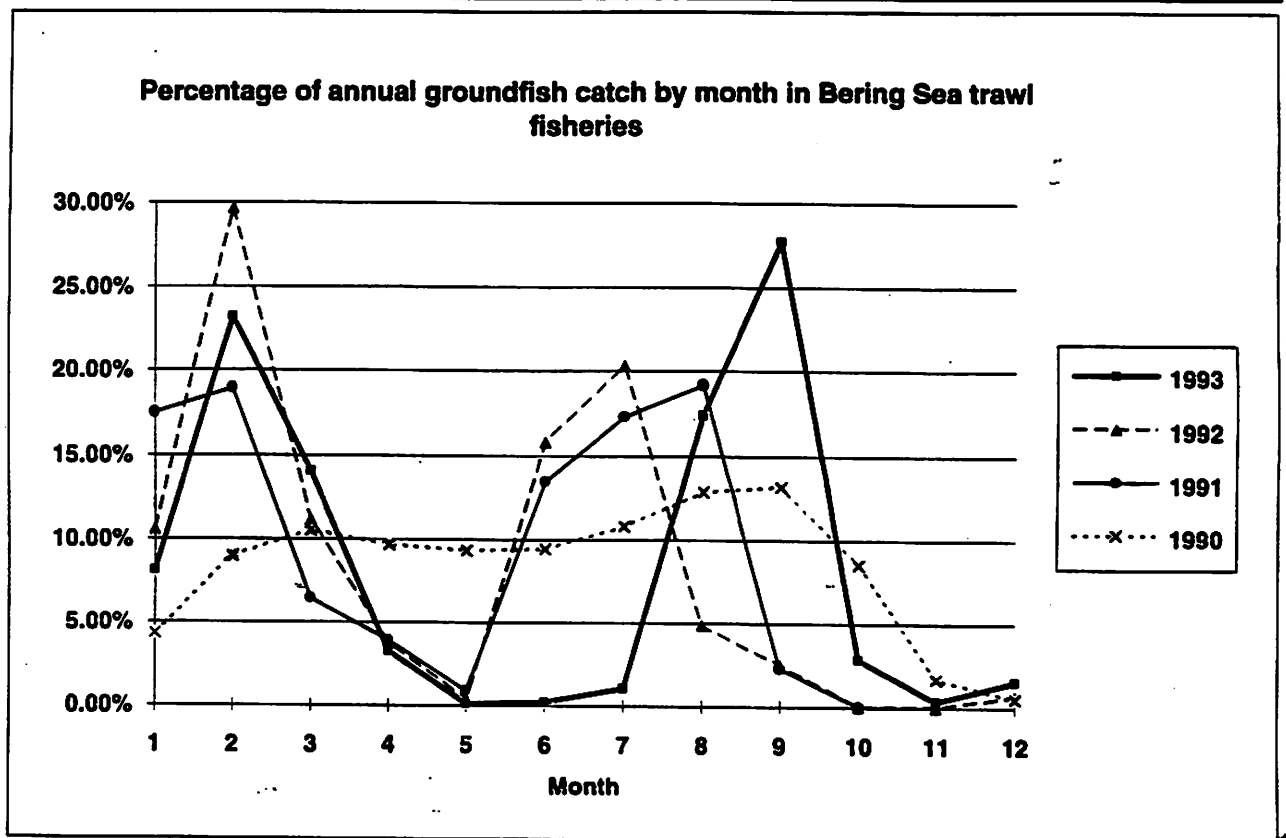
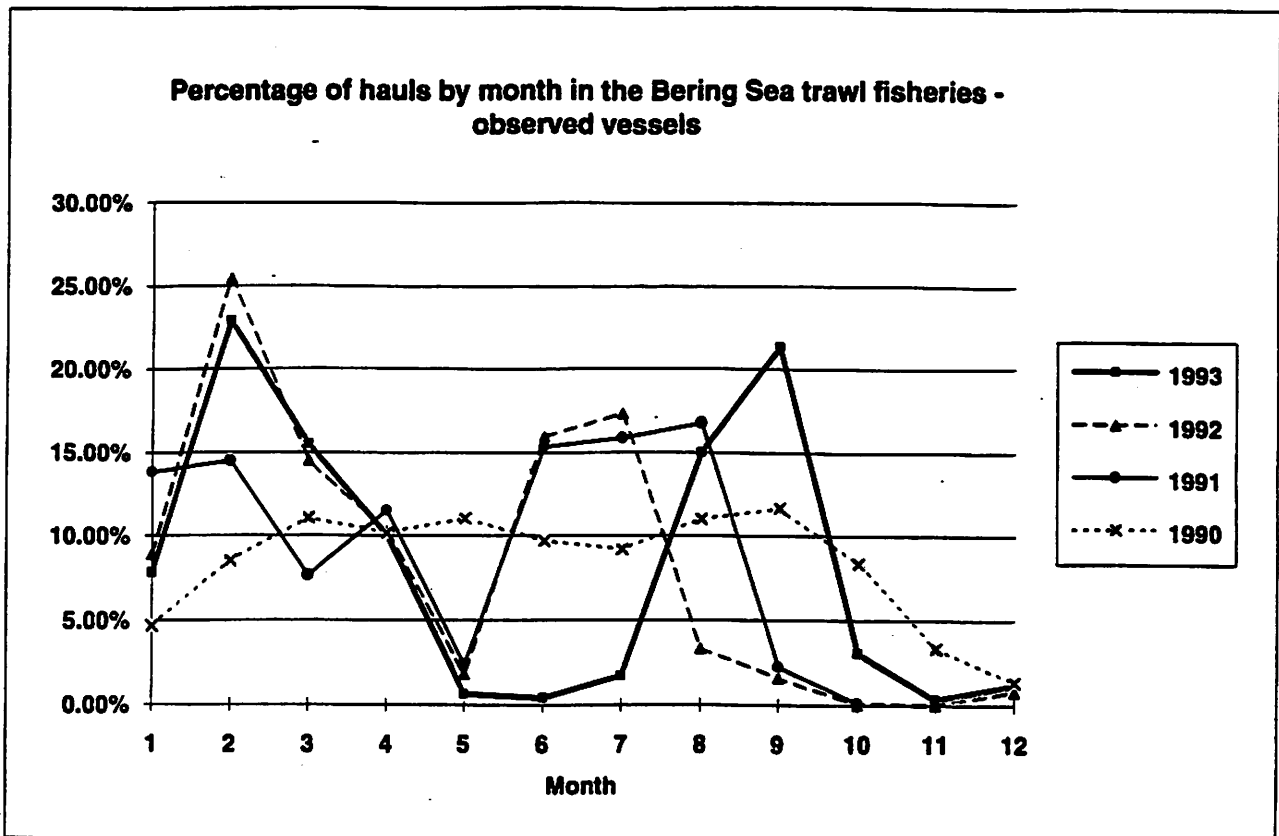


Figure 17. Top: Percentage of annual number of hauls by month from observed vessels only 1990-1993. Bottom: Percentage of total annual groundfish catch by month from observed vessels only, 1990-1993.





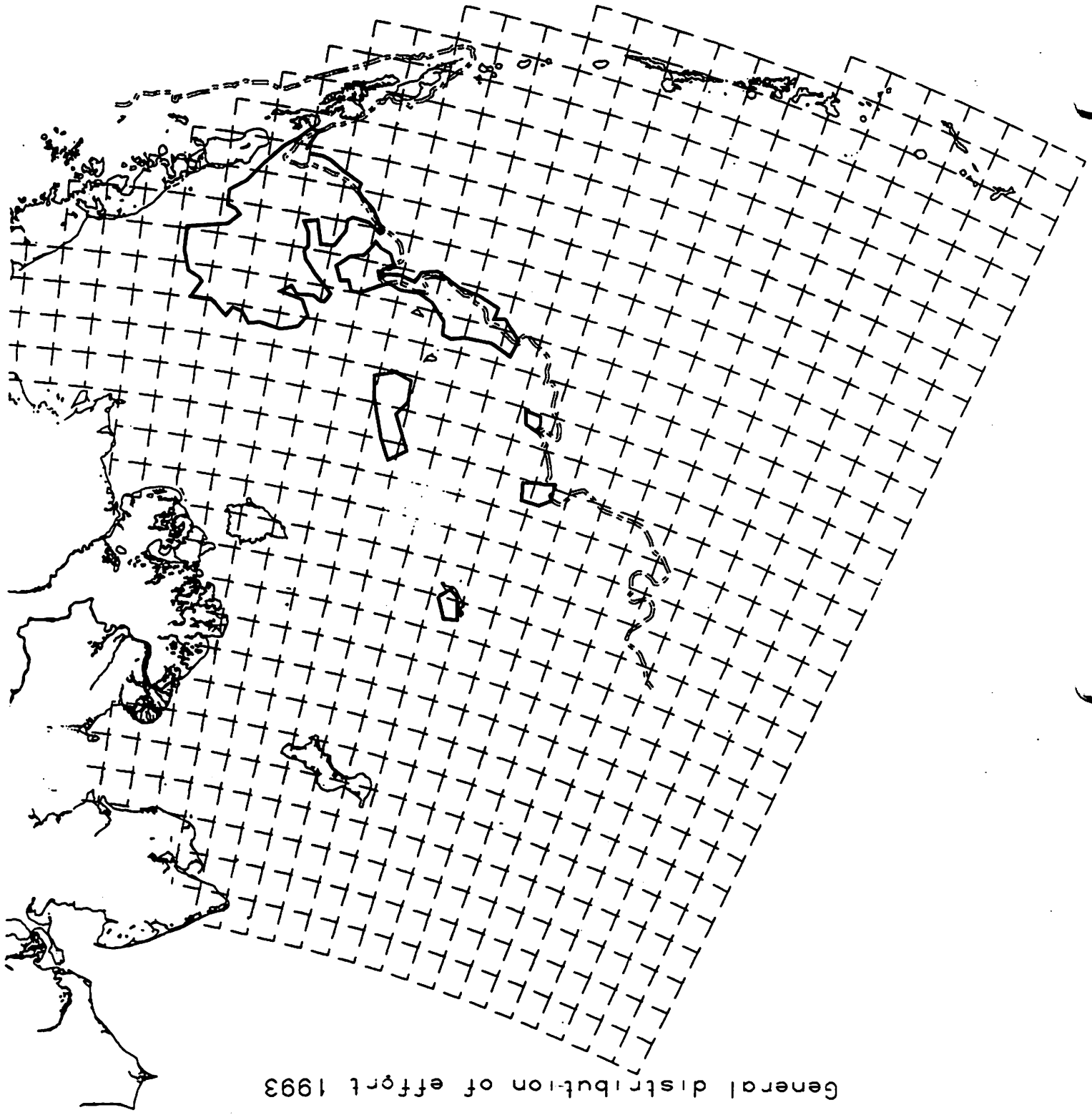


Figure 33. Outline of main concentration of observed trawls operating in the Bering Sea in 1993 during the months of July through October. Some individual hauls can occur outside of the highlighted areas. 200 m contour a dashed line.

Figure 34. Location of observed trawls in the Bering Sea during the months of July through October in 1993 with an other salmon bycatch of more than 50 fish. The CVOA is highlighted and the 200 m contour is a dashed line.

July - October 1993 - hauls with >50 other salmon

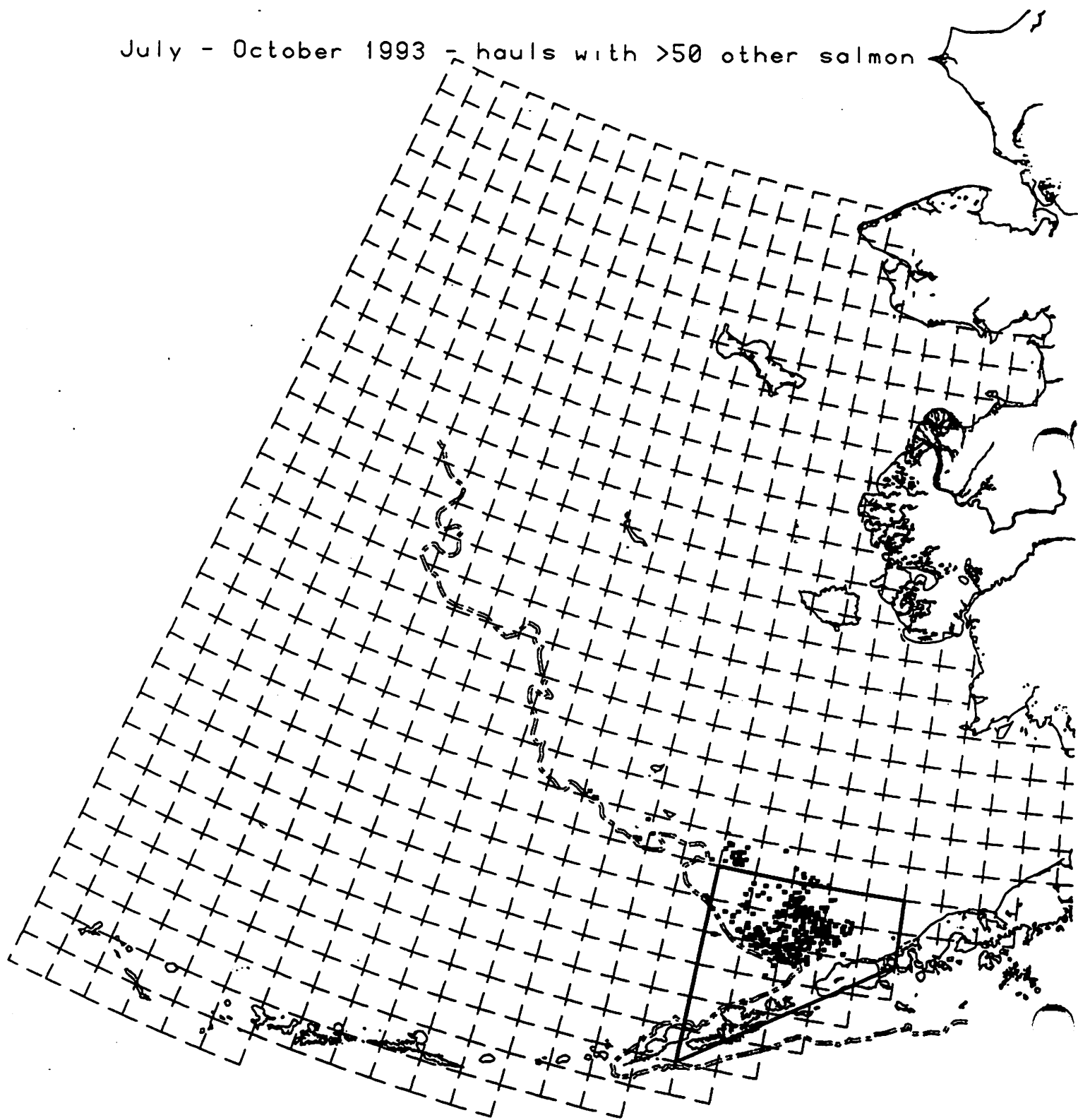
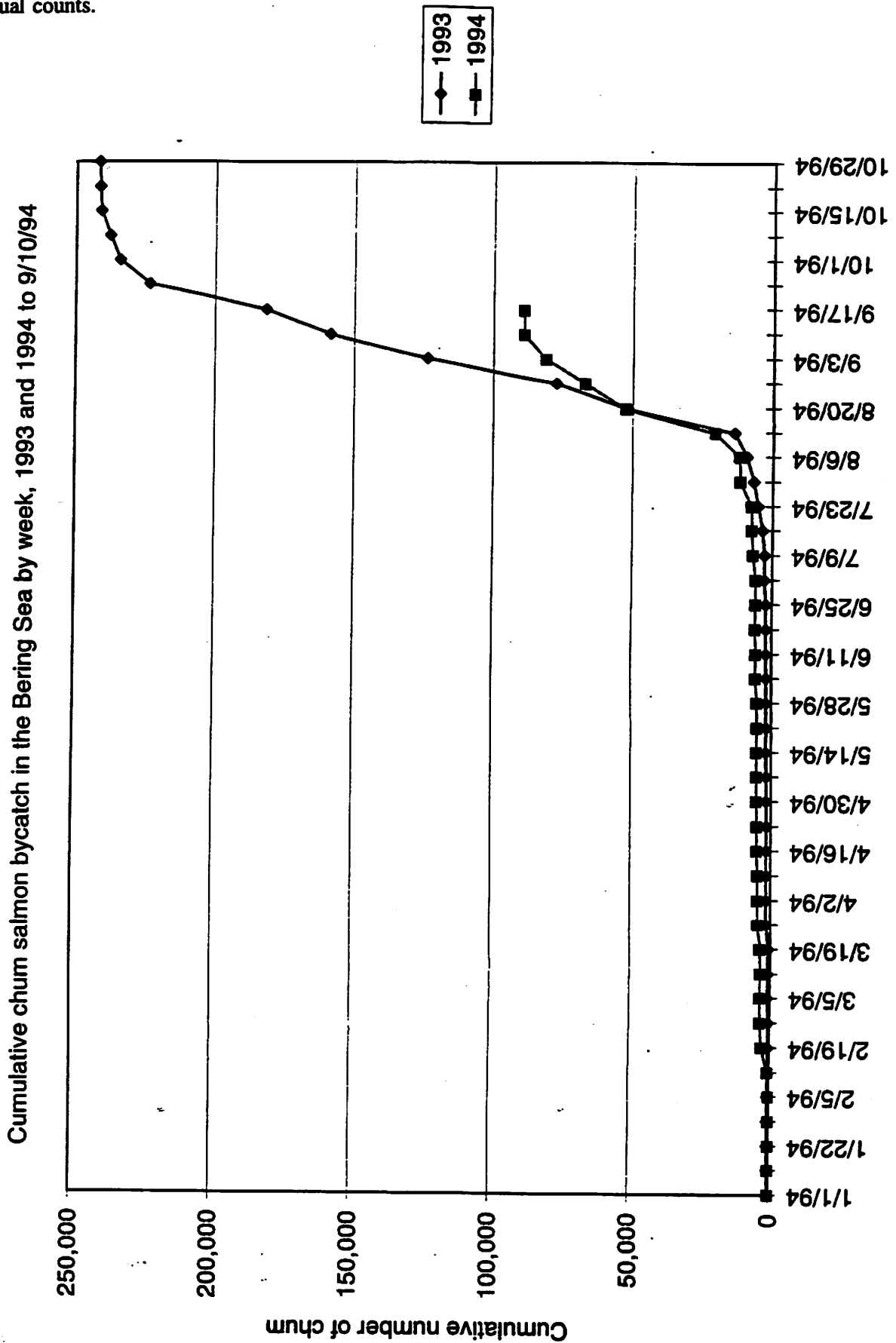
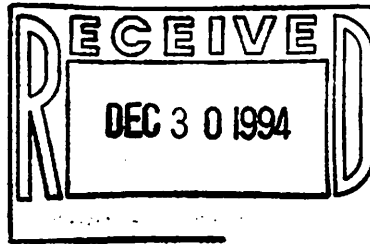


Figure 35. Cumulative weekly bycatch of other salmon from the Bering Sea trawl fisheries in 1993 and 1994 as reported on the NMFS Bulletin Board for identified target species. Estimates are expanded as in 1993, and not actual counts.





December 29, 1994

Clarence Pautzke, Executive Director  
North Pacific Fishery Management Council  
P.O. Box 103136  
Anchorage, Alaska 99510

Dear Mr. Pautzke:

Thank you for the opportunity to review and comment on the EA/RIR/IRFA for chum salmon bycatch. The Tanana Chiefs Conference, Inc. (TCC) is a non-profit consortium that represents forty-three (43) tribal governments in interior Alaska. All of our member villages are situated on the Yukon, Koyukuk, Kuskokwim, and Tanana Rivers. Fisheries resources, especially salmon, are integral to the cultural and nutritional needs of the people living in these regions. For this reason our Wildlife & Parks Program is directly concerned with the amount of salmon that are bycaught by the Bering Sea trawl fleet.

The chum salmon crash in the Arctic-Yukon-Kuskokwim (AYK) region in 1993 along with the extraordinarily high chum bycatch in the 1993 pollock "B" season have heightened our concerns over marine interactions that may affect fish returning to their rivers of origin. It was very apparent to our staff that the 1993 delay of the pollock "B" season to August 15 may have been the dominant factor in the high bycatch of chum salmon during that season. We are aware that the high bycatch of 3-year olds in 1993 contributed very little, if any, to the chum crash of predominantly 4-year olds in the AYK region in 1993. But any salmon bycatch is critical and we must protect our fisheries into the future, especially with respect to the returning adults from the 1993 parent year. These fish will be vulnerable to the trawl fleet as 3-year olds in 1996.

After reviewing the numbers from the 1994 groundfish season it appears that the "5 block" time-area closure, trigger value of 42,000 fish, was very effective in reducing the bycatch of chum to approximately 96,000 fish. This was a reduction of approximately 60% when compared to the 1993 season. This has proved to have been a wise management decision and TCC greatly appreciates the emergency rule action that the NPFMC took on April 24, 1994. The current question is which alternative is appropriate to continue to reduce salmon bycatch by the Bering Sea trawl fleet.

While TCC agrees that some bycatch within the Bering Sea Trawl fleet is inevitable, TCC would like to see the bycatch of chum salmon be reduced to pre-1993 levels or lower. This is not only a conservation issue, but a subsistence and cultural issue as well. Pre-1993 domestic fishery bycatch levels were approximately 30,000 chum salmon. Chum salmon bycatch was below 10,000 fish both prior to 1983, and between 1987 and 1989. To achieve this goal, further restrictions may be needed within the CVOA. Therefore, TCC supports three individual options that may be implemented.

1. The 5 block time-area closure with a lower trigger value.
2. The 9 block time-area closure with a trigger value, possibly  $\leq 20,000$  fish.
3. Movement of the "B" season to a June 1 opening.

Additional information that would be helpful to address options 1 and 2 would be the CPUE before and after the "5 Block" went into affect. Did the "5 block" closure impede the catcher vessels from reaching the pollock quota within a reasonable time period? Could a "9 block" closure be implemented without a significant increase in required fishing effort? The "7 block" closure was considered but it only protects one of the two "Unimak blocks" which are areas of very high bycatch. For year to year comparison purposes and a way to measure the success of the option, TCC prefers the 5 block closure with a lower trigger value.

An alternative option would be to return the start of the "B" season to June 1. This may be the best alternative to prevent new regulations and additional closures. No one likes closures or reductions in fishing time, and no one can testify to this better than the subsistence users of the AYK region. In spite of a June opening in 1991 and 1992 few salmon were bycaught until July, August, and September during those years. Although, one must be cautious as to what the age classes may be on the June bycaught fish.

Additional information that would have been useful to make this decision would have been NMFS annual trawl survey data within the "S block area" during the traditional June season. This would have allowed a salmon/metric ton comparison before and during the "B season" to address the question of whether the high bycatch rates in the 1993 and 1994 seasons were anomalies representing strong populations of three year olds or the result of a seasonal movement into the high bycatch areas.

Additionally, an analysis of the effectiveness of the delay in the "B" season opening date in regards to the purpose of the delay would also be helpful. Did the delay result in higher product recovery rates and better flesh quality in the pollock fishery? Was there an increase in salmon processing opportunities for catcher/processor vessels? Did the delay result in increased trawl opportunities for the catcher vessels? Diversification and additional fishing opportunities area extremely important to Alaska, but the above questions need to be addressed before an accurate decision can be made.

If the high bycatch of salmon is directly related to abundance of salmon the burden of responsibility lies on the fishermen of the recently expanded groundfish fishery to improve their fishing practices to reduce the bycatch. If further research shows that the problem is related to movement of these fish into a high effort area, then the burden of responsibility lies on the NPFMC to move the opening of the "B" season forward to an earlier date. All members of TCC's 43 tribal governments strongly agree that they have been sharing in the responsibility of salmon conservation and that sharing that burden any further will result in continued subsistence fishing closures.

Thank you for the opportunity to review and provide comments on this issue. Our staff has not yet had time to review amendment 21(b) concerning chinook bycatch. I will be present at the January 9th. meeting in Anchorage to clarify and answer any questions the NPFMC may have.

Sincerely,

TANANA CHIEFS CONFERENCE, INC.



Paul Headlee  
Water Resources Specialist

**SALMON RESEARCH FOUNDATION****Report to North Pacific Fishery Management Council  
January 3, 1995**

This report summarizes the Salmon Research Foundation's ("Foundation") 1994 activities and its objectives for 1995, and provides a brief retrospective concerning changes made to Bering Sea salmon bycatch regulations during the last year.

**I. 1994 Activities.**

**A. Background.** The Foundation was formed in December of 1993 as part of the Bering Sea salmon bycatch initiative. Under the terms of that initiative, the Foundation had three primary functions:

(i) promote NMFS regulations and Observer Program procedures to require that salmon bycatch be retained until counted and vessel specific bycatch data be released to the public;

(ii) provide the fleet with current (i.e., within 24 hours or less) reports concerning salmon bycatch patterns encountered by the Bering Sea trawl fleet;

(iii) develop and implement a research plan that addresses further bycatch reduction measures and stock identification of salmon taken as bycatch in the Bering Sea trawl fisheries.

**B. Achievements.** The first objective has been achieved. The retention and counting regulations became final on May 20, 1994, and the related Observer Program procedures were implemented during the 1994 "B" season. Vessel specific bycatch counts are now being posted on the NMFS electronic bulletin board. Because the new regime has important ramifications concerning several aspects of the initiative, it is further discussed in Section III, below.

The second objective is well on its way to being achieved. The pilot "hotspot" program initiated during the 1994 "A" season has been developed and refined, and during the last "B" season, approximately 50% of all observer bycatch reports made it from the grounds, through the Observer Program and Sea State data relay process and to the fleet as compiled graphic displays within 24 hours. In addition, a separate industry program to gather and report shore plant information concerning bycatch hotspots was initiated during the "B" season. The Foundation is currently analyzing the 1994 "B" season bycatch

patterns, and expects to be able to provide the Council with a report concerning the same at the January meeting.

The research plan called for under the third objective was prepared by the Foundation board during August and September of this year. The main elements of the plan are:

(i) continue to improve and offer the bycatch hotspot program, with greater attention to secondary impacts on other species of salmon bycatch avoidance activities;

(ii) identify other bycatch factors besides hotspot location (such as tow duration, depth and speed, water temperatures, gear design, etc.) that could lead to bycatch reduction;

(iv) assemble and catalog existing information concerning Bering Sea salmon bycatch stock identification, identify areas needing attention, and fund research to address those areas;

(v) catalog and analyze existing bycatch data, and correlate it with new data as it is gathered.

Implementation of the research plan has been delayed pending revisions to the organization's assessment structure.

C. Funding. The Foundation began 1994 with an assessment structure of \$20.00 per chinook taken as bycatch in the Bering Sea groundfish fishery. This amount was based on preliminary bycatch feedback and stock identification proposals, and income projections based on pre-retention bycatch estimates. However, data gathering and reporting problems prevented this assessment structure from being effectively applied. Nonetheless, it did produce approximately \$120,000 of income, which has covered the cost of "hotspot" reports, fleet outreach and organizational activities. This amount was far less than the \$500,000 of income originally projected, and as a result the assessment structure for 1995 has been adjusted.

A list of the vessels that contributed in 1994 is being prepared for the Council, and will be delivered during the January meeting.

## II. 1995 Objectives.

A. Funding. Based on estimates by Dr. Mundy and the Foundation's Scientific Advisory Panel and Peer Review Committee, the Foundation board believes approximately \$600,000 per year will be necessary for the next three to four years to fulfill its research plan.

Evaluating its funding needs in light of the new retention, counting and posting regime, the Foundation board proposed in early October a 1995 assessment structure of \$20 per chinook and \$5 per chum taken as bycatch in the Bering Sea trawl fisheries.

The membership of the American Factory Trawler Association has unanimously approved the proposed assessment structure, as have Tyson Seafoods, Oceantrawl and Royal Seafoods.

United Catcher Boats, which represents the majority of Bering Sea pollock and cod catcher boat capacity, has agreed to pay the \$20 per chinook assessment, and has further acknowledged its obligation to fund the Foundation at a level adequate to meet its research plan needs. UCB members believe that the retention and counting regime, which will be in place for the "A" season for the first time in 1995, may result in an amount of income adequate to fulfill the Foundation's 1995 research plan needs being generated by chinook bycatch alone.

The UCB catcher boats have agreed to review a chum assessment prior to the 1995 "B" season if chinook assessment income falls short of that required to meet the Foundation's needs.

As noted below, it is clear that the retention and counting regulations will produce a much more reliable basis for calculating assessments than extrapolations did. The Foundation has retained a bookkeeper to generate assessment invoices from the NMFS bulletin board, and independently measure assessment pledge compliance. These factors support the belief that chinook assessments should produce a much higher level of assessment income in 1995.

Copies of the AFTA and UCB letters of support and lists of the vessels represented by the organizations are attached for your reference. We are still in the process of preparing a list identifying vessels not represented by those organizations which have committed to the \$20/\$5 assessment structure, and will provide it at the January meeting.

In addition to the assessment commitments made by AFTA, UCB and others, the UniSea catcher boats have committed to make a separate \$100,000.00 contribution to the Foundation for "B" season chum stock identification research. Dr. Mundy and the Foundation's Scientific Advisory Panel will be providing a recommendation as to the optimum use of those funds.

B. Research Objectives. Within the research plan objectives listed above, the board expects to focus on the following tasks and projects in 1995:



- Continue providing hotspot reports, while improving their quality and broadening their use. Sea State and the Observer Program are both prepared to issue the next generation of reports in connection with the 1995 "A" season.

- Sponsor research on bycatch factors other than location. Likely areas of focus are target species and bycatch species behavior, and the correlation between factors such as gear design, gear employment and water temperature on bycatch rates.

- Pursue stock identification research. The UniSea catcher boat contribution referenced above, together with increased assessment income, should enable the Foundation to begin a substantive effort in this area. The board will be conferring with its Scientific Advisory Panel and Peer Review Committee in the near future concerning the best areas of focus for this work. The Foundation has been informed that Dr. Anthony Gharrett of the University of Alaska has recently submitted a Saltonstall/Kennedy proposal which would apply several different stock identification techniques to Bering Sea salmon. This proposal by a well recognized researcher offers interesting possibilities.

- Address problems related to collecting tow by tow data from catcher boats, and organize and initially analyze the existing salmon bycatch data base. The Foundation has agreed to act as an advisory body the Alaska Fisheries Development Foundation in connection with a Saltonstall/Kennedy grant proposal addressing these issues. In addition, the Foundation board will be discussing the nature and extent of the in-kind contribution that the Foundation will make to these efforts.

### III. Review of 1994 Regulatory and Procedural Changes.

At the April and June 1993 Council meetings, Foundation organizers actively sought regulatory amendments to require that all salmon be retained until counted by an observer and that PSC bycatch numbers and rates be published by vessel name. The Council approved these regulatory changes in June of 1993, with the intention that they be in place for the 1994 "A" season. However, they did not become effective until late May of 1994.

In hindsight, it is not surprising that the changes took some time to accomplish; implementing them raised a host of confidentiality issues, and required extensive reprogramming of the Observer Program's field procedures, data transmission and data processing activities.

Pending institution of the retention and counting regime, 1994 "A" season bycatch was estimated using prior procedures. All salmon in some tows were counted; in many others, the number of salmon in the haul was estimated by

extrapolating from the species composition of samples taken from the haul. Hauls that were unobserved were assigned the bycatch rate of observed hauls.

While the data generated by these procedures may have some validity at the fleet-wide level, the bycatch estimates assigned to a specific processor or fishing vessel by NMFS were often significantly different than those the processor or vessel actually experienced. This disparity resulted in much debate over the true magnitude of trawl salmon bycatch. In addition, it was reflected in the substantial gap between assessment income projections (which were based on extrapolated, fleet wide bycatch estimates) and actual assessment payments (which were based on the processor and vessel counts).

As noted above, prior to the revisions made during 1994, the Observer Program's salmon bycatch measurements were designed to construct a fleet-wide annual bycatch number, rather than to track each vessel's bycatch performance. Therefore, bycatch data analysis was done as time allowed during the year. Bycatch reports were typically prepared after the season closed, when observers had been debriefed and the data for the season had been groomed for errors. This system could not meet the fleet's need for immediate, real-time information concerning salmon bycatch locations and patterns.

Between the 1994 "A" and "B" seasons, the methods for estimating and reporting salmon bycatch changed dramatically. If these new methods are consistently implemented by NMFS, most of the shortcomings identified above will be resolved..

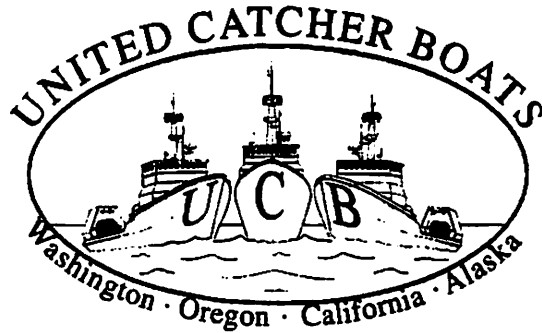
The Observer Program now counts salmon. For example, the counts by reliability code posted on the NMFS bulletin board indicate that for over 70% of the Bering Sea groundfish catch taken in the CVOA immediately prior to and during the 1994 "B" season, either observers directly counted all salmon bycatch, or supervised a counting process that they believe produced an accurate count. The counts are being posted to the NMFS bulletin board by vessel name, giving the fleet and the public an opportunity to review each vessel's performance. This data source finally provides the objective measure of bycatch that we have needed to begin resolving disputes concerning its magnitude and impact. In addition, it will significantly improve the Foundation's ability to project and collect its assessment income. Assessments for the end of 1994 and 1995 will be based on the posted data.

Observers now file their bycatch reports on a daily basis from vessels with satellite communications capability, and on a trip-by-trip basis for vessels delivering to shore plants. This has made it possible to provide the "hotspot" reports described above.

We have a number of times expressed our frustration with the pace at which changes have been made to accommodate the bycatch initiative. Nevertheless, a tremendous amount was accomplished in 1994, and the Alaska Region and Observer Program staffs deserve a great deal of credit for having assisted in accomplishing the changes.

SRPREPX2.910/JMST

Brent C. Paine  
Executive Director



Steve Hughes  
Technical Director

December 29, 1994

Dr. John White, Chairman  
Salmon Research Foundation  
4200 First Interstate Center  
Seattle, Washington 98104

RECEIVED  
DEC 30 1994

Dear John,

MUNDT, MacGREGOR HAPPEL,  
FALCONER, ZULAUF & HALL

At the United Catcher Boats 1994 Annual Meeting, held on December 19, 1994, the membership reviewed the status of the Salmon Research Foundation (Foundation), the proposed 1995 assessment and the involvement of the catcher boats in achieving the goals of the Foundation.

UCB continues to strongly support the efforts of the Foundation to develop methods of reducing salmon bycatch in the BSAI trawl fisheries in addition to overseeing research into the origin of salmon taken in our trawl fisheries as bycatch. To this end UCB adopted a position as an association to support the assessment of \$20 per Chinook salmon for the 1995 season in anticipation of generating necessary funds to achieve the Foundation's goals. In addition, the 14 Unisea vessel owners, many who are UCB members, dedicated \$100,000 of their "overage fund" to the Foundation for stock ID research.

The UCB membership concluded that with accurate accounting in place this year of salmon PSC and with the new invoicing system for payment by committed fishermen, a \$5 per chum salmon hopefully would not be necessary. However, if Chinook salmon assessments fall short of funding requirements, UCB members are willing to review a chum salmon assessment prior to the BSAI pollock 'B' season.

Accompanying this letter are signed assessment agreements from a number of our vessel members. The agreement is slightly modified from the Foundation original sent to fishermen earlier in November, 1994.

Again, UCB is fully in support of the Foundation's efforts. Our members are committed both in developing changes to fishing patterns and in financial support so that the reduction of salmon bycatch is achieved. Creation of time/area/cap closures at this early date in our program would be premature and hamper our ability to work to solve the salmon bycatch problem in a proactive manner.

Sincerely,

  
Brent C. Paine

cc Salmon Research Foundation Board  
Mr. Richard Lauber, Chairman, NPFMC  
Dr. Clarence Pautzke, Executive Director, NPFMC

**UCB VESSEL MEMBER LIST**  
**December, 1994**

1. F/V ALASKAN STAR
2. F/V ALEUTIAN CHALLENGER
3. F/V ALSEA
4. F/V AMERICAN BEAUTY
5. F/V AMERICAN EAGLE
6. F/V AURIGA
7. F/V AURORA
8. F/V CAITLIN ANN
9. F/V CALIFORNIA HORIZON
10. F/V CARAVELLE
11. F/V CHELSEA K
12. F/V DEFENDER
13. F/V DESTINATION
14. F/V DONA LILIANA
15. F/V FLYING CLOUD
16. F/V GOLDEN DAWN
17. F/V GREAT PACIFIC
18. F/V GUN-MAR
19. F/V HALF MOON BAY
20. F/V HAZEL LORRAINE I
21. F/V MAR-GUN
22. F/V MARGARET LYN
23. F/V MARK I
24. F/V MORNING STAR
25. F/V MUIR MILACH
26. F/V NEAHKAHNE
27. F/V NORDIC FURY
28. F/V NORDIC STAR
29. F/V OCEAN LEADER
30. F/V OCEANIC
31. F/V PACIFIC ALLIANCE
32. F/V PACIFIC CHALLENGER
33. F/V PACIFIC FURY
34. F/V PACIFIC PRINCE
35. F/V PACIFIC VIKING
36. F/V PAULITA
37. F/V PROGRESS
38. F/V ROSELLA
39. F/V ROYAL AMERICAN
40. F/V SEAWOLF
41. F/V SHARON LORRAINE
42. F/V STARFISH
43. F/V STARLITE
44. F/V STARWARD
45. F/V SUNSET BAY
46. F/V TRACY ANNE
47. F/V VESTERAALEN
48. F/V VIKING
49. F/V WESTERN DAWN
50. F/V WESTWARD I

**UNITED CATCHER BOATS MEMBERS, 1994****BOARD OF DIRECTORS**

**John Gruver, President**  
F/V Seawolf

**Frank Steuart, Vice Pres.**  
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**Robert Czeisler, Secretary**  
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**Capt. Frank Bohannon, Board**  
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**Capt. Bob Desautel, Board**  
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F/V Dona Paulita

**Capt. Bob Dooley, Board**  
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F/V Hazel Lorraine I  
F/V Sharon Lorraine

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**Thor Olsen, Board Member**  
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**Hugh Reilly, Board Member**  
F/V California Horizon  
F/V Viking  
F/V Westward I

**Gary Westman, Board**  
F/V Caravelle  
F/V Rosella

**ALTERNATES**

**John Dooley, Alternate**  
F/V Caitlin Ann  
F/V Pacific Prince  
F/V Hazel Lorraine I  
F/V Sharon Lorraine

**Stan Hovik, Alternate**  
F/V Pacific Fury

**Gunner Ildhuso, Jr., Alternate**  
F/V Gun-Mar

**Jim Salisbury, Alternate**  
F/V Alaskan Star  
F/V Pacific Alliance

**Walter Kuhr, Jr., Alternate**  
F/V Dona Liliana  
F/V Dona Paulita

**Captain Cory Swasand, Altern.**  
F/V Nordic Star  
F/V Starfish  
F/V Starlite  
F/V Starward

**Bob Watson, Alternate**  
F/V Seawolf

**MEMBERS**

**Olav Austbeburg**  
F/V Destination  
F/V Royal American

**Bob Breskovich**  
F/V Aleutian Challenger

**Tim Cosgrove/Chris Garbrick**  
F/V Mark I

**Terry Cosgrove/Jim Thil**  
F/V Chelsea K

**Gunnar Ildhuso, Sr.**  
F/V Mar-Gun

**Einar Langesaater**  
F/V Oceanic

**Jim McManus, Trident**  
F/V Flying Cloud  
F/V Pacific Viking

**Barry Ohai**  
F/V Defender

**Einar Pederson, Jr.**  
F/V Vesteraalen

**Chet Peterson**  
F/V Pacific Challenger

**Steve Sarich**  
F/V Golden Dawn

**David Stanchfield**  
F/V Morning Star

**Ken Tippit**  
F/V Great Pacific  
F/V Destination

**Joe Wabey/Reidar Tynes**  
F/V American Eagle

# AMERICAN FACTORY TRAWLER ASSOCIATION



November 18, 1994

Dr. John White, Chair  
Salmon Research Foundation

Dear Dr. White:

The American Factory Trawler Association (AFTA) has been very pleased with the progress of the Salmon Research Foundation over the past year. We are aware that the progress that has been made in real time communication between vessels and the data crunchers and the development of the research goals, objectives and program, has been in no small part, due to your leadership.

We continue to support the efforts that all parties are making to reduce bycatch of salmon. We are aware that the resources needed to fully implement the program are more than the resources being generated by the chinook assessment.

At the AFTA November Retreat, the membership concluded that they would be agreeable to paying a five dollar (\$5.00) per chum salmon their vessels catch, assessment to help the research program, particularly stock I.D., proceed. We urge the Salmon Research Foundation to seek additional funds from any and all sources. We strongly urge the other participants in fisheries that catch chum salmon, incidental to their other fishing operations, to participate in this research effort.

We would appreciate your directing Joe Sullivan, acting Executive Director of the Foundation, to prepare and mail out assessment agreements so that the program can continue.

Sincerely,

Joseph R. Blum  
Executive Director

cc All Salmon Research Foundation Board Members  
Mr. R. Lauber, Chairman NPFMC

AFTA VESSEL LIST

December 28, 1994

ALASKA OCEAN SEAFOOD, INC.  
ALASKA OCEAN

ALASKA TRAWL FISHERIES, INC.  
ENDURANCE

AMERICAN SEAFOODS COMPANY  
AMERICAN EMPRESS  
AMERICAN DYNASTY  
AMERICAN TRIUMPH  
PACIFIC EXPLORER  
PACIFIC SCOUT

ARCTIC KING FISHERIES  
ARCTIC TRAWLER  
RESOLUTE

ARCTIC STORM, INC.  
ARCTIC STORM  
ARCTIC FJORD

EMERALD RESOURCE MGT., INC.  
CLAYMORE SEA  
HEATHER SEA  
SAGA SEA

GLACIER FISH COMPANY, LTD.  
NORTHERN GLACIER  
PACIFIC GLACIER

GOLDEN AGE FISHERIES  
REBECCA IRENE  
BROWNS POINT

GOLDEN ALASKA SEAFOODS  
GOLDEN ALASKA

MORNING STAR FISHERIES  
ALFUTIAN SPEEDWELL

M/V SAVAGE  
SEAFISHER



## SALMON RESEARCH FOUNDATION

Report to North Pacific Fishery Management Council  
January 13, 1995

This report supplements the Salmon Research Foundation's January 3, 1995 report to the Council.

I. 1994 Contributions and 1995 Commitments. Attached as Attachment 1 is a list identifying the 1994 Bering Sea pollock and cod fleet, and the subsets of that fleet that have contributed to the Foundation in connection with their 1994 fishing activity and/or committed to contribute in connection with their 1995 fishing activity. The list is based on information received from ADF&G, and has been supplemented with information from the NMFS bulletin board and from processors and trade associations.

**This list is not yet final.** A number of vessels on the list (i.e., those that participated in the 1994 crab fishery, for example) had no chinook bycatch prior to their "B" season fishing, and therefore have made no 1994 assessment payments to date. The Foundation is currently in the process of preparing invoices for "B" season chinook bycatch, and expects to collect assessments related to that bycatch during the first quarter of 1995. The related payments should increase the number of 1994 participants. Also, the Foundation has been receiving 1995 commitments on an ongoing basis through the date of this report, and some may still be forthcoming. An updated 1994-1995 report will be provided to the Council in April.

As several previous Foundation reports to the Council have noted, because the retention and counting regulations were not in place during the 1994 "A" season, it was not possible for the Foundation to produce amount-specific chinook assessment invoices for that fishery. Vessel owners expected to receive such invoices. The Foundation's inability to provide them was certainly a factor in contributing to the number of assessment payments and their total amount being lower than anticipated. As noted in the Foundation's January 3 report to the Council, this problem no longer exists. Consequently, the Foundation expects that a higher commitment to contribution ratio in connection with the 1995 "A" season.

As also noted in the January 3 report to the Council, the 14 catcher boats that deliver pollock to the Unisea plant in Unalaska have committed to make an independent contribution of \$100,000 to the Foundation for "B" season chum bycatch stock identification. A list of those vessels is attached as Attachment 2.

II. 1994 "B" Season Bycatch. A preliminary review of the 1994 "B" season bycatch reports posted on the NMFS bulletin board and the Sea State bycatch pattern plots provides information that the Foundation Board believes the Council may find useful in its discussions concerning salmon bycatch.

A. Bycatch Amounts. Even though the retention and counting regime was in place for the 1994 "B" season, there still appear to be wide discrepancies among the salmon bycatch estimates posted by NMFS to the "Prohibited Species Bycatch Mortality" report (which we understand to be the bycatch amounts that are used by NMFS for fishery management purposes), the "Other Salmon Catch in CVOA by Reliability Code" report, and the "Vessel Specific" bycatch report.

The Mortality report shows approximately 87,000 other salmon being taken in the midwater pollock fishery (a very large proportion of which, according to NMFS, is attributable to CVOA catch). The Reliability Code report shows 52,000 other salmon being taken in the CVOA between the beginning of August and mid October. The Vessel Specific report shows approximately 42,000 other salmon being taken by the fleet during the same period.

The Foundation Board is concerned regarding the disparity among these bycatch numbers. While the Board is pleased that some progress has been made toward the goal of reaching non-controversial salmon bycatch estimates, it is clear that significant progress remains to be made.

B. Vessel By Vessel Report Analysis. A summary of bycatch data from the vessel-by-vessel reports is attached as Attachment 3. As the report shows, when the data is sorted to identify vessels by the number of weeks they showed up in the category of the worst 10% for a given fishing week (i.e., to identify the "dirty dozen"), different salmon bycatch profiles can be identified.

Of the 125 vessels in the pollock fishery, 50 did not appear in the top 10% category during any week of the season, 45 made it into that category once, and 20 appeared there twice. The vessels in the latter two categories are conceivably those that experienced one or more "lightning strike" events of salmon bycatch.

However, 6 vessels showed up in the top 10% during 3 weeks of the season, and 4 vessels were in that category for 4 weeks. Together, these 10 vessels took over 25% of the total chum salmon bycatch posted to the vessel-by-vessel report on the NMFS

bulletin board in connection with the "B" season fishery. The consistency with which these vessels appear in the "dirty dozen," and the percentage of the total bycatch taken by them, suggests that some unique aspect of the time, place or manner of their operations resulted in higher bycatch numbers than one would expect from a "lightning strike" bycatch pattern.

The Foundation Board believes that analyses of this type are useful for developing and/or adjusting appropriate bycatch management strategies and measures, and for identifying vessels that should be subjected to "peer pressure" concerning their fishing practices. The Foundation Board plans to have the fishing practices and bycatch rates of the vessels in the "dirty dozen" examined by a biometrician to determine if guidance concerning bycatch avoidance practices (other than simply relocating) can be derived from an analysis of their practices.

In light of the foregoing, the Foundation Board recommends that the vessel-specific salmon bycatch data which is posted on the NMFS bulletin board be analyzed by NMFS and ADF&G to:

(i) identify the rank of each vessel by salmon catch for each statistical week, and for the season as a whole. The weekly number one vessel would be the vessel capturing the most salmon in a week, and the seasonal number one vessel would be the one with the most for the season;

(ii) rank each vessel for each statistical week during the season, so that the number of times a vessel scored in the top 10 salmon catchers during each week of the season could be identified; and

(iii) the agencies compute the average catch per vessel per season, the standard error of this mean, and the 95% confidence interval about the mean, so that the catch of any one vessel could be readily compared to the average performance of the fleet.

The Board further recommends that the results of these analyses be posted on the NMFS bulletin board and reported to the Council on a regular basis.

C. Sea State Pattern Display. The Foundation has arranged to have Sea State produce day-by-day displays of the bycatch pattern plots it produced during the "B" season. These displays will be provided to the Council in connection with the Foundation's oral report.

Attachment 1

1994  
BERING SEA POLLOCK AND COD  
CATCHER BOATS AND FACTORY TRAWLERS

SALMON RESEARCH FOUNDATION  
ASSESSMENT PAYMENTS AND COMMITMENTS

January 3, 1995

<u>VESSEL NAME</u>	<u>1994 ASSESSMENT PAID</u>	<u>1995 COMMITMENT</u>
AJ.....		
ALASKA OCEAN (f/t).....		X
ALASKAN STAR (c/b).....		X
ALDEBARAN (c/b).....	X	X
ALEUTIAN CHALLENGER (c/b).....	X	X
ALEUTIAN SPEEDWELL (f/t).....	X	X
ALLIANCE (c/b).....	X	X
ALSEA (c/b).....	X	X
ALYESKA (c/b).....	X	X
AMBER DAWN (c/b).....		
AMERICAN BEAUTY (c/b).....	X	X
AMERICAN CHAMPION (f/t).....	X	X
AMERICAN DYNASTY (f/t).....	X	X
AMERICAN EAGLE (c/b).....	X	X
AMERICAN EMPRESS (f/t).....	X	X
AMERICAN NO. 1 (f/t).....		
AMERICAN TRIUMPH (f/t).....	X	X
ARCTIC I (c/b).....	X	X
ARCTIC III (c/b).....	X	X
ARCTIC IV (c/b).....	X	X
ARCTIC FJORD (f/t).....		X
ARCTIC STORM (f/t).....		X
ARCTIC TRAWLER (f/t).....	X	X
ARCTURUS (c/b).....	X	X
ARGOSY (c/b).....	X	
ARICA (f/t).....	X	X
AURIGA (c/b).....	X	X
AURORA (c/b).....	X	X
BERING ENTERPRISE (f/t).....	X	X
BRISTOL ENTERPRISE (f/t).....	X	X
BROWN'S POINT (f/t).....	X	X
CAITLIN ANN (c/b).....		X
CALIFORNIA HORIZON (c/b).....	X	X
CAPE HORN (f/t).....	X	X
CAPE KIWANDA (c/b).....		X
CARAVELLE (f/t).....	X	X
CHELSEA K (c/b).....		X
CLAYMORE SEA (f/t).....		X

COLUMBIA (c/b)	X	X
COMMODORE (c/b)		
DEFENDER (c/b)	X	X
DESTINATION (c/b)	X	X
DONA LILIANA (c/b)		X
DONA MARTITA (c/b)		X
DONA PAULITA (c/b)		X
ENDURANCE (f/t)		X
EXCALIBUR II (c/b)	X	
FIERCE ALLEGIANCE (c/b)		
FLYING CLOUD (c/b)	X	X
GOLDEN DAWN (c/b)	X	X
GREAT PACIFIC (c/b)	X	X
GUN-MAR (c/b)	X	X
HARVESTER ENTERPRISE (f/t)	X	X
HALF MOON BAY (c/b)		X
HAZEL LORRAINE (c/b)		X
HEATHER SEA (f/t)		X
HICKORY WIND (c/b)		
ISLAND ENTERPRISE (f/t)	X	X
KODIAK ENTERPRISE (f/t)	X	X
LISA MELINDA (c/b)		
LONE STAR (c/b)		X
MAJESTY (c/b)		
MARAUDER (c/b)		
MARCY J (c/b)		
MARGARET LYN (c/b)	X	X
MAR-GUN (c/b)	X	X
MARK I (c/b)	X	X
MISS BERDIE (c/b)		
MISS LEONA		
MORNING STAR (c/b)	X	X
MS AMY (c/b)		
MUIR MILACH (c/b)		X
NEAHKAHNIE (c/b)		X
NORDIC FURY (c/b)	X	X
NORDIC STAR (c/b)	X	X
NORTHERN EAGLE (f/t)		X
NORTHERN GLACIER (f/t)	X	X
NORTHERN HAWK (f/t)		X
NORTHERN JAEGER (f/t)		X
OCEAN LEADER (c/b)	X	X
OCEAN ROVER (f/t)		
OCEANIC (c/b)	X	X
PACIFIC ALLIANCE (c/b)		X
PACIFIC CHALLENGER (c/b)		X
PACIFIC EXPLORER (f/t)	X	X
PACIFIC FURY (c/b)	X	X
PACIFIC GLACIER (f/t)	X	X
PACIFIC KNIGHT (c/b)		

PACIFIC MONARCH (c/b)	X	
PACIFIC PRINCE (c/b)		X
PACIFIC RAM (c/b)	X	X
PACIFIC SCOUT (f/t)	X	X
PACIFIC VIKING (c/b)	X	X
PEGASUS (c/b)	X	
PERSEVERANCE (c/b)		
REBECCA IRENE (f/t)		X
RESOLUTE (f/t)	X	X
ROSELLA (f/t)	X	X
ROYAL AMERICAN (c/b)	X	X
ROYAL ATLANTIC (c/b)		
ROYAL KING (f/t)	X	X
ROYAL SEA (f/t)	X	X
SAGA SEA (f/t)		X
SEADAWN (c/b)	X	X
SEATTLE ENTERPRISE (f/t)	X	X
SEAWOLF (c/b)	X	X
SEEKER (c/b)		
SHARON LORRAINE (c/b)		X
SNOW KING (f/t)	X	X
STARBOUND (f/t)		
STARFISH (c/b)	X	X
STARLITE (c/b)	X	X
STARWARD (c/b)	X	X
STORM PETREL (c/b)		
SUNSET BAY (c/b)		X
U.S. ENTERPRISE (f/t)	X	X
U.S. DOMINATOR (c/b)	X	X
UNIMAK ENTERPRISE (f/t)	X	X
VAERDAL (f/t)		
VALIANT (f/t)		
VESTERAALEN (c/b)	X	X
VIKING (c/b)	X	X
VIKING EXPLORER (c/b)	X	X
WESTERN DAWN (c/b)	X	X
WESTWARD I (c/b)	X	X
WINDJAMMER (c/b)		

Other vessels which have signed Letters of Intent:

ALASKAN	MILKY WAY
ALEUTIAN BELLE	MIRANDA ROSE
CAPE FALCON	NEW OREGON
CAROL MARY	PALISADES
COHO	COURTNEY NORAL
DAKOTA	PROVIDER
DISTANT WATER	RAVEN
EXODUS	SANDRA FAY

GOLDRUSH.....SEAFISHER  
LESLIE LEE.....U.S. DOMINATOR  
PROGRESS

Pollock and Cod Vessels:	126	
Vessels Making 1994 Payments:	75	60%
Vessels Making 1995 Commitments:	99	79%

Directr4.910

Attachment 2

1994  
UNISEA POLLOCK FLEET

ALSEA  
ALYESKA  
AMERICAN EAGLE  
ARGOSY  
AURIGA  
AURORA  
DEFENDER  
GUN-MAR  
NORDIC STAR  
PACIFIC MONARCH  
SEA DAWN  
STARFISH  
STARLITE  
STARWARD



## Other Salmon Bycatch Rates

### Summary Data From NMFS BBS For BSA B Season Pollock Fishery

Vessel Category	Weeks in Dirty Dozen	Vessel Weeks by Category	# of Vessels by Category	Average Salmon per Vessel Week	Average Salmon During Bad Weeks	Total Salmon by Vessel Category
All	NA	1078	125	39	NA	42,487
A	0	468	50	4	NA	1,920
B	1	187	45	43	416	17,600
C	2	166	20	73	203	12,135
D	3	45	6	82	321	3,994
E	4	24	4	285	340	6,838

The data from the NMFS BBS was sorted to identify the worst 10% of vessel weeks of Other Salmon bycatch.

Vessels known not to be involved in the BSA B season Pollock fishery were excluded.

Vessels were categorized by the number of weeks they had catches of salmon which exceeded the "dirty dozen" threshold.

The number of salmon by each category of vessels was summed and the average # of salmon by week was calculated.

The average number of salmon by week by each category of vessels was also calculated for just those weeks in which they "qualified for the dirty dozen..

Attachment 3

Week	Average Salmon by Vessel
20-Aug	191
27-Aug	49
3-Sep	48
10-Sep	32
17-Sep	26
24-Sep	9
1-Oct	4
8-Oct	3
15-Oct	0

