

SALE OF ROE FROM SUBSISTENCE CAUGHT
SALMON IN THE ARCTIC-YUKON-KUSKOKWIM
REGION, 1974-1977

REPORT TO THE ALASKA BOARD OF FISHERIES
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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
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TABLE OF CONTENTS

	<u>Page</u>
List of Tables and Figures	ii
Preface	1
Introduction and Background	2
General Description and Management of the Roe "Fishery".....	4
Production, Value and Participation.....	7
Special Management Considerations and Problems.....	12
Conclusions and Recommendations.....	22
Appendices.....	28
I. Chapter 99 SLA 1975.....	29
II. Board of Fisheries Regulations: Chapter 03, Article 8.....	32
III. Subsistence salmon roe sales information by sub-area and year, Kuskokwim area, 1974-77.....	33
IV. Subsistence salmon roe sales information by sub-area and year, Yukon area, 1974-77.....	34
V. Commercial salmon catches and fishermen values for the Kuskokwim and Yukon Rivers, 1974-77.....	35
VI. Subsistence salmon catches made in the Kuskokwim and Yukon Rivers, 1964-77.....	36

LIST OF TABLES

	<u>Page</u>
Table 1. Subsistence salmon roe sale information by management area and year, Arctic-Yukon-Kuskokwim Region, 1974-77.....	8
Table 2. Comparison between "quotas" and actual catches obtained from roe sales and from fishermen interviews, AYK Region, 1974-77, (1977 actual catches are preliminary).....	14
Table 3. Comparison of subsistence salmon catch trends for selected Kuskokwim River villages for periods 1970-73 and 1974-77....	20
Table 4. Comparison of subsistence salmon catch trends for selected Yukon River villages for periods 1970-73 and 74-77.....	21

LIST OF FIGURES

	<u>Page</u>
Figure 1. A-Y-K Region Map	6
Figure 2. Comparison of subsistence roe sales and average earnings between commercial and subsistence fishermen, Yukon River 1974-77; Kuskokwim River 1977.....	11
Figure 3. Kuskokwim River (subdistrict 1) daily subsistence king salmon catches	23

Preface

The sale of roe from subsistence caught salmon has been allowed in the Arctic-Yukon-Kuskokwim region since 1974. Section 16.05.827 of the Alaska Statutes, providing for legalization of these sales, has expired. The Legislature has directed the Department to recommend if the sale of subsistence salmon roe should be continued beyond the 1977 season.

This report comprises an updating of the 1976 report presented to Legislature and, with the benefit of additional information from the 1977 fishing season, presents a more comprehensive review of this issue. Slight revisions have been made to some of the data previously presented in the 1976 report.

SALE OF ROE FROM SUBSISTENCE-CAUGHT SALMON
IN THE ARCTIC-YUKON-KUSKOKWIM REGION

Introduction and Background

In years past when native people were experiencing a traditional or "pure" subsistence type of livelihood, all or nearly all portions of fish captured were probably utilized. Salmon roe, a fish by-product, was consumed by people with probably greater quantities fed to their sled dogs. Due to recent changes in employment and welfare opportunities, there has been a gradual decline in the dependence upon subsistence fishing in many areas. Replacement of sled dogs with snowmachines has also been a very important influence on the decline in utilization of salmon and salmon roe. Reports received from various village residents, indicated that much of the roe from subsistence caught salmon was discarded in the recent years prior to 1974. Actual amounts of salmon roe either discarded or utilized during these earlier years were never documented.

Initial interest in permitting sales of subsistence caught salmon roe came from commercial salmon buyers. Beginning with the 1973 season, most Kuskokwim area buyers and a few buyers in the upper Yukon illegally augmented their roe production to some extent from subsistence fishing channels. It was estimated that illegal purchases of subsistence salmon roe represented 10-15 percent of the reported commercial roe production for the Kuskokwim area in 1973.

Three different bills were introduced in the 1974 Legislature that involved legalization of the sale of subsistence caught salmon roe. None of these bills passed as they remained in committee through adjournment.

It was apparent that in the spring of 1974 several commercial salmon buyers were gearing up to illegally purchase even larger amounts

of subsistence roe. Both the Department's of Fish and Game and Public Safety assigned additional personnel for fishery patrol in an attempt to minimize the illegal purchases of subsistence roe. The major thrust of the enforcement program consisted of increased surveillance of buying and processing stations. News releases and public notices were issued to clarify existing regulations.

An emergency regulation with an effective date of June 15, 1974 was issued by Commissioner James Brooks which allowed the unrestricted sale of salmon roe obtained as an unavoidable product of legal subsistence fishing throughout the entire A-Y-K region. Issuance of the emergency regulation, in effect for 120 days, was coincidental with the beginning of the salmon runs.

The Legislature finally adopted an Act in 1975 (Appendix I) with an effective date of May 29 that legalized subsistence salmon roe sales only in the A-Y-K region. These statutes contained the following important provisions:

1. Expiration date was January 1, 1977 which was subsequently extended to encompass the 1977 fishing season. Sales after this time will presumably depend on further review and action by the Legislature and the Board of Fisheries.
2. No person may purchase or trade for subsistence salmon roe unless he possesses an annual permit issued by the Commissioner.
3. The Commissioner may close any or all areas to the sale of subsistence salmon roe if the waste of carcasses, damage to stocks or circumvention of management programs is occurring. A separate section defining the "waste of salmon" and penalties for violators was included.

4. If the subsistence catch in an area exceeds or is likely to exceed by 10 percent the 1974 subsistence catch for that area, the Commissioner shall close that area to the sale of subsistence salmon roe.
5. The Board of Fisheries may adopt regulations necessary to allow the sale of roe based on traditional subsistence needs coupled with the maintenance of salmon stocks on a sustained yield basis.

To administer the legislation, Commissioner Brooks issued an emergency regulation in June of 1975. This emergency regulation contained provisions pertaining to permitting and reporting requirements in addition to prohibiting subsistence roe sales in areas where the salmon runs were especially vulnerable or where recent subsistence salmon catches were negligible.

The Board of Fisheries in December of 1975 adopted regulations for the 1976 season that were similar to the provisions contained in the aforementioned emergency regulation. The Board regulations contain an additional important provision which provides that sale of subsistence roe may be prohibited when the subsistence catch exceeds or is likely to exceed the 1970-74 average annual harvest in any district, subdistrict or portions thereof. These regulations, including several adopted at the December 1976 meeting, will remain in effect until changed by future Board action or superceded by legislation. (Appendix II).

General Description and Management of the Roe "Fishery"

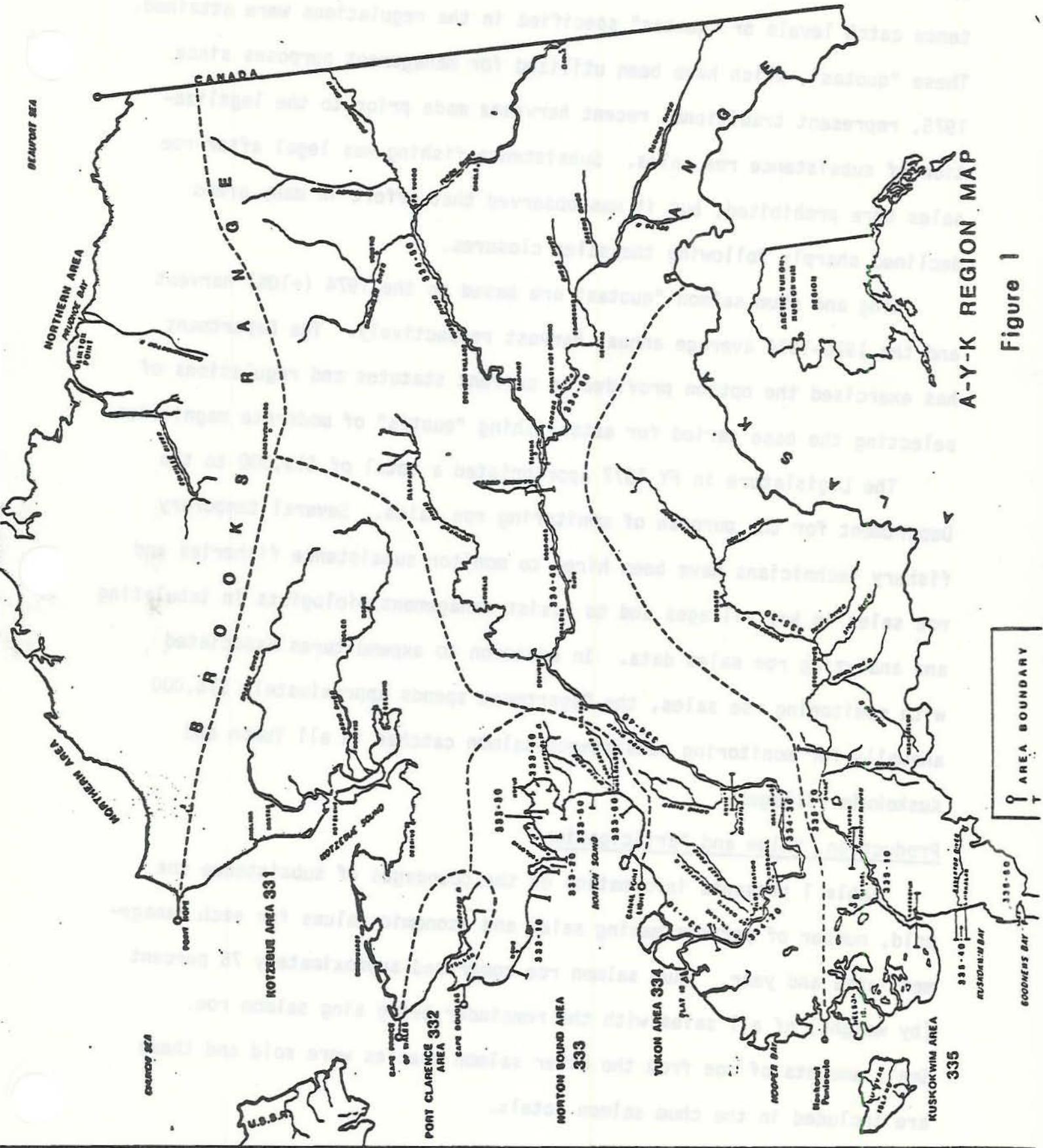
Current Board of Fisheries' regulations allow the sale of subsistence salmon roe only in the main Yukon River, main Tanana River downstream of the Chena River, main Kuskokwim River downstream of the Kolmakof River, Goodnews Bay and at Quinhagak. Although permitted over a greater

portion of the region in 1974 and 1975, the vast majority of sales occurred in the aforementioned areas (Figure 1).

Since subsistence fishing occurs in many widely scattered villages and fish camps, the roe buyers have developed an extensive collection system. Buyer representatives are placed in most villages and the larger fish camps where subsistence roe sales are permitted. Fishermen are given plastic buckets in which to place roe and these are transported almost daily by boat or aircraft to processing plants, most of which are located in Bethel, Galena, Manley Hot Springs, Nenana and Fairbanks. For the most part, processing is done by Japanese technicians who salt and pack the roe using conventional methods required for marketing in Japan.

Due to the extensive nature of the subsistence fishery, the critical task of monitoring roe sales is time consuming and expensive. Accurate and timely information regarding the amounts of roe sold is essential since sales are prohibited when subsistence harvests exceed levels specified in the regulations. For example, with subsistence fishing occurring from 5 to 7 days a week, as much as 45,000 pounds of roe representing a subsistence catch of nearly 100,000 fish can be made in the Kuskokwim River during a single week. Pounds of roe by species sold daily and weekly are obtained from written reports and special roe tickets provided by buyers.

Annual subsistence harvests since statehood have been obtained by comprehensive surveys consisting of personal interviews of fishermen made at the end of the fishing season. Present regulations require that estimates of in-season catches also be obtained. This is accomplished by translating pounds of subsistence roe sold to numbers of fish using sex ratio and average roe weight information which are obtained each week from catch samples.



A-Y-K REGION MAP

Figure 1

Several emergency orders were issued during 1975-1977 prohibiting subsistence roe sales in various subdistricts and sections when subsistence catch levels or "quotas" specified in the regulations were attained. These "quotas", which have been utilized for management purposes since 1975, represent traditional recent harvests made prior to the legalization of subsistence roe sales. Subsistence fishing was legal after roe sales were prohibited, but it was observed that effort in many areas declined sharply following the sales closures.

King and chum salmon "quotas" are based on the 1974 (+10%) harvest and the 1970-1974 average annual harvest respectively. The Department has exercised the option provided in current statutes and regulations of selecting the base period for establishing "quotas" of moderate magnitudes.

The Legislature in FY 1977 appropriated a total of \$19,000 to the Department for the purpose of monitoring roe sales. Several temporary fishery technicians have been hired to monitor subsistence fisheries and roe sales in key villages and to assist management biologists in tabulating and analyzing roe sales data. In addition to expenditures associated with monitoring roe sales, the Department spends approximately \$16,000 annually for monitoring subsistence salmon catches in all Yukon and Kuskokwim villages.

Production, Value and Participation

Table 1 presents information on the poundages of subsistence roe sold, number of persons making sales and economic values for each management area and year. Chum salmon roe comprised approximately 75 percent (by weight) of all sales with the remainder being king salmon roe. Small amounts of roe from the other salmon species were sold and these are included in the chum salmon totals.

Table 1. Subsistence salmon roe sale information by management area and year, Arctic-Yukon-Kuskokwim Region, 1974-77.

	Pounds of raw product			Value of sales	Number of persons reporting sales	Average sales value per person	Number of processors	First wholesale value ^{4/}
	King	Chum	Total					
1974								
Kuskokwim	34581	98602	133,183	\$180,000	1438	\$ 125	4	\$360,000
Yukon ^{1/}	2452 ^{2/}	79565 ^{2/}	82,017 ^{2/}	61,513 ^{3/}	237 ^{3/}	260 ^{3/}	11	123,026
Total	37033 ^{2/}	178167 ^{2/}	215,200 ^{2/}	241,513 ^{3/}	1675 ^{3/}	144 ^{3/}	15	483,026
1975								
Kuskokwim	24399	57711	82,110	\$124,000	1200	103	4	\$248,000
Yukon ^{1/}	2467	70540	73,007	84,908	263	323	14	169,816
Total	26866	128251	155,117	208,908	1463	143	18	417,816
1976								
Kuskokwim ^{1/}	62210	95541	157,751	336,000	1321	254	6	672,000
Yukon ^{1/}	5830	68657	74,487	99,430	331	300	14	198,860
Total	68040	164198	232,238	435,430	1652	262	20	870,860
1977								
Kuskokwim	51174	116000	167,174	635,876	1304	488	7	1,271,860
Yukon	15407	63430	78,837	209,539	632	332	15	419,078
Total	66581	179430	246,011	845,415	1936	437	20 ^{5/}	1,690,938
Totals (all years)								
Kuskokwim	172364	367854	540,218	1,275,876	-	-	7	2,551,860
Yukon	26156	282192	308,348	455,390	-	-	15	910,780
Total	198520	650046	848,566	1,731,266	-	-	20 ^{5/}	3,462,640

1/ Slight revisions made in previously reported data.

2/ Includes small amount of roe taken in Norton Sound.

3/ Does not include small undetermined number of Norton Sound fishermen.

4/ Based on 2x that of fishermen value.

5/ Two buyers purchased roe from both areas.

A total of 849,000 pounds of roe was sold in the Yukon and Kuskokwim areas during 1974-77 worth \$1.7 million to the fishermen. During the same period the commercial salmon catch in these areas totaled 45 million pounds, worth \$17.2 million to the fisherman (Appendix V). Subsistence salmon catches totaled 2.2 million fish during this period (Appendix VI).

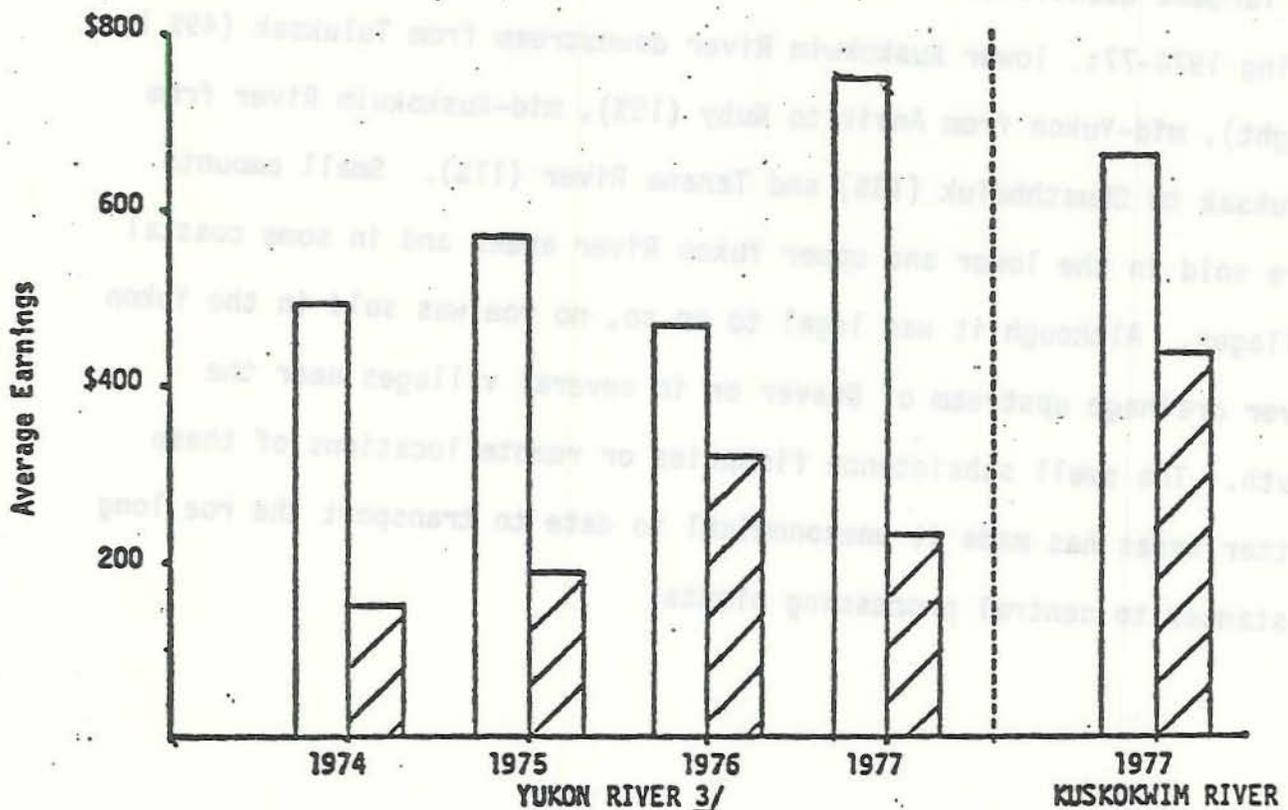
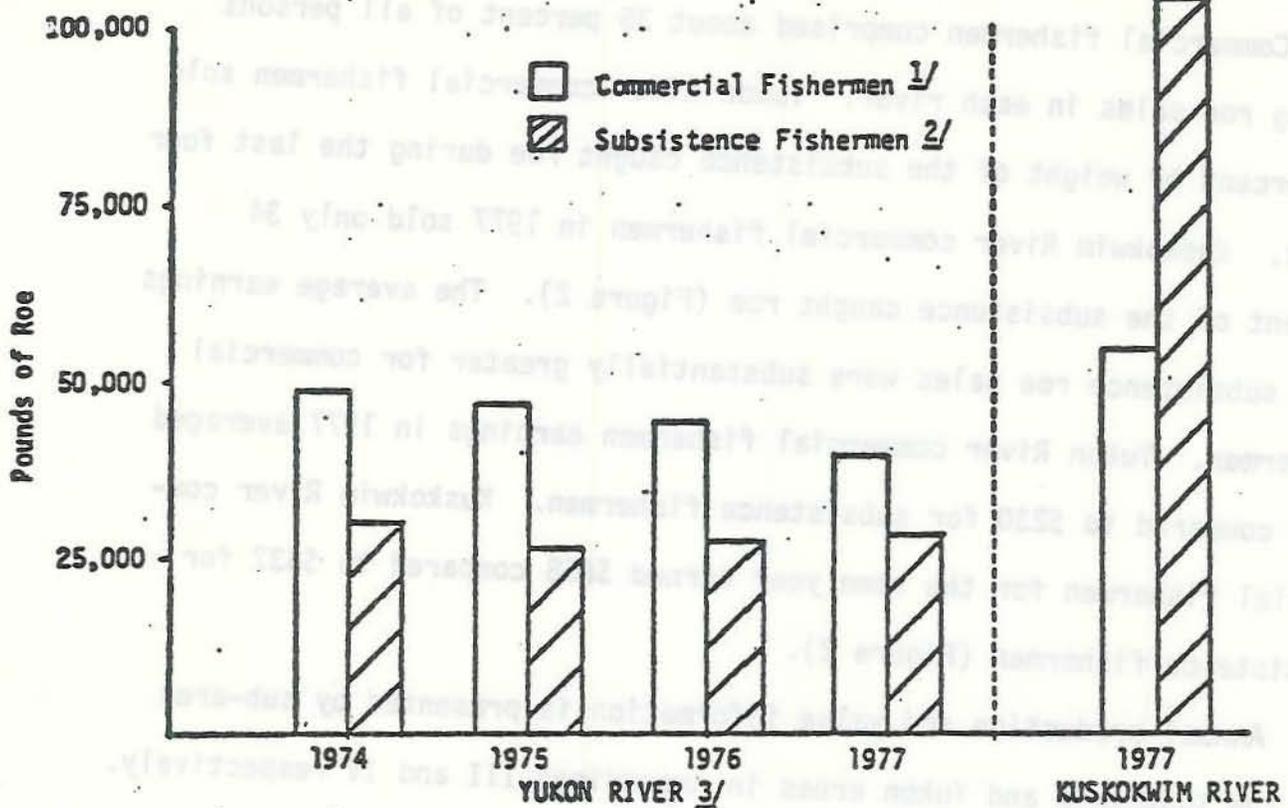
Record roe sales were made in 1977 totaling 246,000 pounds from all species. Totals of 215,200, 156,000 and 232,000 pounds were sold in 1974, 1975 and 1976 respectively. Record sales were also made in 1977 from the standpoint of fishermen earnings (\$845,000), average earnings (\$437) and first wholesale value (\$1,691,000).

The numbers of persons making roe sales each year ranged from 1463 to 1936. In 1977 it was determined that of the 1936 persons selling roe, approximately 34% (663) held an entry permit and probably fished commercially. Forty two percent had fished commercially in 1976. All persons that made sales were probably not fishermen since it was common practice for the parents to give roe to their children to sell, especially in Kuskokwim River villages.

Twenty subsistence roe buyers operated in the region during 1977 with the five major buyers processing 80 percent (by weight) of all roe purchased. Thirteen buyers operated in the Yukon area, 5 in the Kuskokwim area and 2 in both areas. Two Bethel based buyers processed 50 percent of the roe. Only one Yukon based buyer was among the top five with only 7 percent of the production. Prices paid to Kuskokwim River fishermen averaged \$3.80/pound an increase of \$1.68/pound over 1976 prices. Yukon fishermen received an average of \$2.65/pound, an increase of \$1.27/pound. It was difficult to obtain accurate first wholesale values which was finally estimated at twice the value received by fishermen.

Commercial fishermen comprised about 35 percent of all persons making roe sales in each river. Yukon River commercial fishermen sold 60 percent by weight of the subsistence caught roe during the last four years. Kuskokwim River commercial fishermen in 1977 sold only 34 percent of the subsistence caught roe (Figure 2). The average earnings from subsistence roe sales were substantially greater for commercial fishermen. Yukon River commercial fishermen earnings in 1977 averaged \$748 compared to \$230 for subsistence fishermen. Kuskokwim River commercial fishermen for the same year earned \$658 compared to \$437 for subsistence fishermen (Figure 2).

Annual production and value information is presented by sub-area for the Kuskokwim and Yukon areas in Appendices III and IV respectively. The largest quantities of roe were sold in the following sub-areas during 1974-77: lower Kuskokwim River downstream from Tuluksak (49% by weight), mid-Yukon from Anvik to Ruby (15%), mid-Kuskokwim River from Tuluksak to Chuathbaluk (13%) and Tanana River (11%). Small amounts were sold in the lower and upper Yukon River areas and in some coastal villages. Although it was legal to do so, no roe was sold in the Yukon River drainage upstream of Beaver or in several villages near the mouth. The small subsistence fisheries or remote locations of these latter areas has made it uneconomical to date to transport the roe long distances to central processing plants.



1/ persons that sold roe from subsistence-caught fish and also fished commercially based on possession of a commercial fishing entry permit

2/ persons that sold roe from subsistence-caught fish and did not fish commercially; includes family members of commercial fishermen

3/ upstream of Holy Cross

Special Management Considerations and Problems

Traditionally, the subsistence salmon fishery was naturally limited by personal food requirements and the numbers of salmon that could be handled in a day and hung to dry or smoke during the season. These restraints do not apply to any fishery where the profit motive becomes of major importance. For example, a Kuskokwim River subsistence fisherman currently is paid an average of \$10.00 and \$3.00 for the roe sold from a single king and chum salmon respectively. These prices, especially for chum salmon roe, are only slightly less than what the carcasses of these species are worth to a commercial fisherman in the same area. The high value of subsistence salmon roe is an incentive for some individuals - buyers and fishermen - to risk violating either the intent or legal wording contained in existing statutes and regulations. Wastage, misuse and overfishing of the salmon resource were documented for specific times and locations during the past four seasons.

A possible consequence resulting from the continuation of subsistence roe sales is that the concept and management of subsistence fishing may be permanently altered. Subsistence fishing regulations in the A-Y-K region are quite liberal which has been in recognition of the supplemental protein needs of a large rural population. If the problems cited in this section continue, then the state policy which assigns the highest priority among beneficial uses to subsistence fishing must be re-examined. Most salmon populations are being harvested at maximum levels, and an increase in subsistence fishing effort and utilization must be countered with additional restrictions on subsistence fishing, commercial fishing or on both fisheries.

The remainder of this section is a discussion of special problems associated with subsistence salmon roe sales.

Catch Reporting: Table 2 compares the catch "quotas" with in-season estimates from roe sales and catches from end of the season surveys. Differences between these data point out the difficulty associated with determining the magnitude of subsistence catches by any method. Large differences between catches derived from these two methods are generally the result of the following: 1) continued legal fishing after roe sales are prohibited; 2) incomplete catch documentation during end of season surveys; 3) intentional and unintentional reporting errors by fishermen and 4) all roe from subsistence caught salmon is not sold.

Kuskokwim and Yukon River king salmon catches obtained from fishermen interviews have always been larger than catches derived from roe poundages. The major reason for this is that legal subsistence fishing normally continues after roe sales for this species have been prohibited.

The average chum salmon catch obtained from Kuskokwim River fishermen interviews during 1974-77 has been approximately 25 percent smaller than the average catch estimated from roe poundages. Fishermen from four villages (Napaskiak, Kwethluk, Bethel and Tuluksak) in 1977 reported catches that were 40 percent less than those estimated from roe sales. It is believed that this is a result of the incompleteness of Department surveys and reporting errors by fishermen. From close inspection of individual records, there is little doubt that some fishermen are intentionally underreporting their catches. The reasons for this are not clear, but may involve a sense of guilt for harvesting more salmon than required.

Due to difficulties involved with obtaining timely and accurate in-season estimates, annual king and chum catch "quotas" for the Kuskokwim River were substantially exceeded before roe sales for these species

Table 2. Comparison between "quotas" and actual catches obtained from roe sales and from fishermen interviews, AYK Region, 1974-77. (1977 actual catches are preliminary).

<u>King Salmon</u>	<u>Kuskokwim River (subdistricts 1 & 2)</u>			<u>1977</u>
	<u>1974</u>	<u>1975</u>	<u>1976</u>	
"Quota" <u>1/</u>	None	27,600	27,600	27,600
Catch <u>2/</u>	20,300	32,000	43,000	36,300
Catch <u>3/</u>	25,100	45,400	59,600	53,700
 <u>Chum Salmon</u>				
"Quota" <u>1/</u>	None	169,800	169,800	169,800
Catch <u>2/</u>	313,000	185,100	246,100	222,900
Catch <u>3/</u>	260,900	158,250	202,800	176,350
 <u>King Salmon</u>				
<u>King Salmon</u>	<u>Yukon River (excluding Yukon Territory)</u>			<u>1977</u>
	<u>1974</u>	<u>1975</u>	<u>1976</u>	
"Quota" <u>1/</u>	None	17,050	17,050	17,050
Catch <u>2/</u>	637	2,363	3,533	10,378
Catch <u>3/</u>	14,237	12,806	10,371	10,417
 <u>Chum Salmon</u>				
"Quota" <u>1/</u>	None	207,491	207,491	207,491
Catch <u>2/</u>	131,567	142,656	171,567	114,451
Catch <u>3/</u>	222,798	199,794	162,217	153,802

- 1/ "Quotas" established by Department in 1975 and adopted as Board regulations in 1976: subsistence roe sales prohibited when king salmon catches exceed 1974 recorded catches by 10% and when chum salmon catches exceed 1970-74 average annual recorded catches.
- 2/ Catches estimated in-season from lbs. of subsistence roe sold using sex ratio and average roe weight per fish information.
- 3/ Catches from systematic personal interview and survey of subsistence fishermen conducted at end of fishing season, 1977 catch data preliminary.

were prohibited by emergency order. During the 1977 season, buyers were required to submit written reports twice a week, but this was largely ineffective in monitoring production due to reporting errors and the large amounts of roe often sold during a single day.

Wastage: Department of Fish and Game and Public Safety personnel documented only five or six instances of intentional fish wastage during the past four years involving carcasses left to rot in garbage dumps or along the shore. Violation citations were not issued due to lack of evidence regarding names of persons involved. Fish wastage during the fishing season is difficult to detect and prosecute since the disposal of carcasses must be witnessed and is relatively easy to conceal (by throwing fish into the river or into bank vegetation).

However, many reports or complaints have been received from local residents involving the intentional wastage of salmon carcasses. A total of nine reports involving wastage were received in 1977, more than in any other year. Most of these alleged violations were reported for the middle Yukon and Tanana River areas ranging from a few fish to over 1000 fish. Although many of these alleged violations were personally witnessed, informants would not indicate the names of persons involved. In nearly all the aforementioned instances of documented and alleged carcass disposals, the roe had been removed from the female salmon.

Another difficult to detect, but potentially greater form of wastage exists. Large quantities of dried salmon captured the previous summer have been observed by Department personnel in caches and smokehouses of several Kuskokwim villages during the spring. If properly cared for, dried salmon can be kept overwinter to be utilized as dog food the following summer. Due to the poorer condition of these fish, many probably have been discarded when fishing during the current year's run

begins. Often the portion of the catch in excess of real need is stored in the open and is very susceptible to spoilage. Again, local residents have reported that this form of wastage does occur in some Yukon and Kuskokwim River communities.

At the beginning of the 1977 season, Department personnel examined 34 caches (storehouses) in several lower Kuskokwim River villages and fish camps. A total of 2210 dried salmon harvested during the 1976 season were observed in 23 of these caches. Eleven caches did not contain any salmon from the previous year. Most cache owners were fishing and beginning to dry salmon (1977).

While visiting one of the villages located downstream of Bethel in mid-June of 1977, a Department employee learned that one or more local residents were broadcasting over citizens band radio that last year's dried fish should be discarded. The reason that prompted this action is not clear, but may include an attempt to "hide" fish taken in excess of need.

Violation Citations: Protection officers working out of the Bethel office during the summer of 1977 issued seven citations involving violations of regulations pertaining to the sale of subsistence salmon roe. Six of these were issued for the Kuskokwim River with one issued for the Yukon River. The majority of these violations involved illegal purchases or sales of subsistence roe during closed periods. Three violations were successfully prosecuted, two were closed with no leads, one was closed as no violation and one is still pending adjudication. Few violation citations involving subsistence roe sales were issued prior to the 1977 season.

Exceptionally Large Individual Catches and Sales: Individual records were examined to pinpoint extremely large subsistence catches and earnings from roe sales which were made by a small minority of the fishermen. Records were examined during all years for Yukon fishermen and during only 1977-for Kuskokwim fishermen. The largest Yukon individual catches, composed of a majority of chum salmon, occurred in the middle Yukon and Tanana River. Villages in these areas generally have a large number of sled dogs that are used for competitive racing. Several fishermen captured in excess of 5,000 chum salmon each season with a high individual catch of 15,000 reported. Four or five fishermen each year made unusually large chum salmon catches but owned relatively few dogs. These fishermen captured a total of 84,317 chums during the four year period which averaged 900 fish per dog each year. One fisherman with three persons in the family and owning only three dogs took 8,000 chum salmon in a single season. Highest individual earnings from subsistence roe sales of \$9,200 was made by a Tanana fisherman in 1977. Another Tanana River fisherman made \$9,000 in 1974 when roe prices were approximately one-third of current prices.

Individual catches for the Kuskokwim River during 1977 in excess of 300 kings and 1200 chums were considered substantially above average. Most of the large individual catches were made in the middle Kuskokwim area and in one or two lower river villages. The largest catch of 400 kings and 2900 chums was made by a fisherman with four persons in the family owning only two dogs. An individual high of \$8,300 in roe sales was made from this catch. The next greatest individual earnings from roe sales was \$6,800.

Circumvention of Regulatory and Statutory Intent: Other incidences that

were documented by Department personnel were not violations, but involved attempts to circumvent the intent of existing regulations and statutes. Fishermen who hold entry permits can fish for commercial and subsistence purposes. Many Yukon fishermen sell only male salmon in the round to commercial fish buyers and retain females for subsistence selling the roe. At least two Yukon buyers, specializing in subsistence roe production, continued to purchase only females (\$2.00 ea.) after the close of the subsistence roe "season". Also several commercial salmon buyers complained that many deliveries made to their plants consisted of nearly all males which was not in their best economic interests.

Changes in Subsistence Catches and Fishing Effort: Prices increased substantially in all areas during the 1977 season and there was intense competition between buyers for subsistence roe. A carnival like atmosphere developed near the end of the roe "seasons" in the Kuskokwim River when buyers began bidding against one another. Some buyers offered fishermen price increases of up to \$1.00 a pound during the last day or two of the "season". In the Kuskokwim River the largest amounts of king salmon roe (approx. 22%) were sold on the last day of the season. In the middle river (subdistrict 2) the pounds of king salmon roe sold on the last day of the season was twice that for any other day. Similarly the pounds of chum salmon roe sold during the last day of the season in this same area was three times that for any other day. Chum roe sales in the lower river (subdistrict 1) did not demonstrate this trend and were spread more evenly throughout the "season". This information along with observations made during 1977 aerial and boat surveys indicated that fishing effort, except during the subdistrict 1 chum salmon run, increased after the announced roe "season" closures and declined sharply after the roe "seasons" were closed. These conditions are symptomatic of a fishery exhibiting profit motivation.

Subsistence catches of chum salmon, the most abundant species, declined throughout a majority of the A-Y-K region during 1966-73 due to decreased effort resulting from fewer sled dogs being kept and more employment opportunities. Kuskokwim River catches did not exhibit a similar decline during this period. Yukon and Kuskokwim River chum salmon catches in areas open to subsistence roe sales increased substantially during 1974-77 compared to previous recent years. This increase was probably due to a combination of factors that included above average run magnitudes and increased fishing effort due to the ability to sell subsistence roe.

Table 3 compares subsistence catch trends for selected Kuskokwim River villages during the four year period prior to and after the legalization of subsistence roe sales. The average 1970-74 catch for villages representative of the area of legal roe sales increased 35 percent compared to the 1970-73 period. The average 1970-74 catch for villages representative of the closed area decreased 4 percent compared to the 1970-73 period. The average 1970-74 catch for Upper Kalskag and Lower Kalskag, in the area open to roe sales, increased 111 percent compared to the previous four years. Other villages in the area of legal roe sales with substantially increased catches during the 1970-74 period included Napaskiak, Akiak, Tuluksak and Aniak.

Table 4 compares subsistence catch trends for selected Yukon River villages. The average 1974-77 catch for villages representative of areas where a majority of the roe sales occurred increased 69 percent compared to the previous four years. Increased catches were the greatest for Anvik, Grayling and Manley Hot Springs. All villages exhibited increased harvests during 1974-77 with Tanana having the smallest increase. The average 1974-77 catch for villages representative of areas either closed to roe sales or where sales did not occur increased 22 percent

Table B . Comparison of subsistence salmon catch trends for selected Kuskokwim River villages for periods 1970-73 and 1974-77^{1/}

Village	Roe Sales Prohibited					Village Roe Sales Permitted (1974-1977) ^{2/}						
						Roe Sales Permitted					Average	(% change)
	1970	1971	1972	1973	Average	1974	1975	1976	1977			
Tuntutulak	12,665	11,805	14,317	16,431	13,805	28,898	10,921	13,247	11,579	16,161	+ 17%	
Hapakiak	21,331	6,295	7,200	10,224	11,262	22,718	14,494	12,807	10,732	15,187	+ 35%	
Napaskiak	14,615	8,955	10,436	10,526	11,113	21,367	15,233	25,084	13,577	18,815	+ 69%	
Bethel	50,501	18,636	25,256	42,828	34,305	39,523	38,496	40,185	24,468	35,668	- 4%	
Kwethluk	35,634	19,505	16,858	23,009	23,752	42,441	22,363	31,313	30,251	31,592	+ 33%	
Akiachuk	36,798	17,116	13,138	12,456	19,877	16,834	17,542	20,965	23,640	19,745	0%	
Akiak	16,293	11,952	7,007	8,013	10,816	19,726	16,727	15,413	16,566	17,108	+ 58%	
Tuluksak	9,621	6,395	6,463	7,268	7,437	14,144	9,157	13,244	10,401	11,757	+ 58%	
Kalskag ^{3/}	19,347	9,995	7,955	10,727	12,006	23,945	21,234	31,830	24,169	25,295	+111%	
Aniak	12,166	6,009	7,348	14,577	10,025	11,257	10,998	14,997	27,946	16,297	+ 63%	
Totals	228,971	116,663	115,978	156,059	154,418	240,853	177,155	219,085	193,409	207,626	+ 35%	

	Village Roe Sales Prohibited (1970-1977)										
	1970	1971	1972	1973	Average	1974	1975	1976	1977	Average	(% change)
Crooked Creek	9,900	3,385	3,841	2,250	4,844	5,604	2,699	3,500	3,539	3,836	(- 21%)
Sleetmute	4,625	3,384	4,362	2,672	3,761	4,481	6,023	2,407	4,350	4,315	(+ 15%)
Stony River	8,512	4,717	3,095	4,162	5,122	4,767	6,063	6,054	3,333	5,054	(+ 1%)
Totals	23,037	11,486	11,298	9,084	13,726	14,852	14,785	11,961	11,222	13,205	(- 4%)

1/ king and chum catches combined

2/ village selected on the basis of the ten villages with largest subsistence catches

3/ Upper and Lower Kalskag

Table 4 . Comparison of subsistence salmon catch trends for selected Yukon River villages for periods 1970-73 and 1974-77^{1/}

Village Roe Sales Permitted (1974-77)

Village	Roe Sales Prohibited					Roe Sales Permitted					
	1970	1971	1972	1973	Average	1974	1975	1976	1977	Average	(% change)
Anvik	9,991	8,273	3,761	20,923	10,737	29,372	31,007	26,744	23,914	27,759	(+159%)
Grayling	12,703	7,316	6,613	13,294	9,982	27,968	24,576	27,617	15,751	23,978	(+140%)
Nulato	27,190	18,839	8,012	13,875	16,979	38,473	23,671	14,221	13,596	22,490	(+ 32%)
Tanana	23,378	25,701	14,569	11,760	18,852	13,236	26,422	22,930	19,648	20,559	(+ 9%)
Manley	170	-0-	105	62	84	196	6,213	9,726	16,944	8,270	(+9745%)
Nenana	11,755	21,364	21,755	14,837	17,428	20,828	27,167	15,209	24,909	22,028	(+ 26%)
Totals	85,187	81,493	54,815	74,751	74,062	130,073	139,056	116,447	114,762	125,094	(+ 69%)

Village Roe Sales Prohibited (or did not occur)

Village	1970	1971	1972	1973	Average	1974	1975	1976	1977	Average	(% change)
	Alakanuk	11,583	9,011	6,243	7,012	8,452	13,312	3,786	11,229	6,804	8,783
Emmonak	7,446	5,714	5,128	11,206	7,374	7,596	5,391	8,795	7,563	7,336	0%
Hughes	6,483	17,280	2,804	2,573	7,285	8,796	5,454	4,435	4,929	5,903	(- 19%)
Huslia	4,030	1,473	535	4,517	2,639	6,670	5,048	8,812	3,603	6,033	(+129%)
Allakaket	7,887	9,041	892	2,538	5,090	7,172	5,760	4,446	3,808	5,296	(+ 4%)
Ft. Yukon	7,367	4,204	2,117	3,610	4,325	1,172	19,673	2,281	14,691	9,454	(+119%)
Totals	44,796	46,723	17,719	31,456	35,174	44,718	45,112	39,998	41,397	42,806	(+ 22%)

^{1/} king and chum catches combined

compared to the previous four years. Four of these villages exhibited no appreciable change in catch trends over the eight year period, but two villages, Huslia and Ft. Yukon, exhibited substantial increases although the total numbers of fish were small.

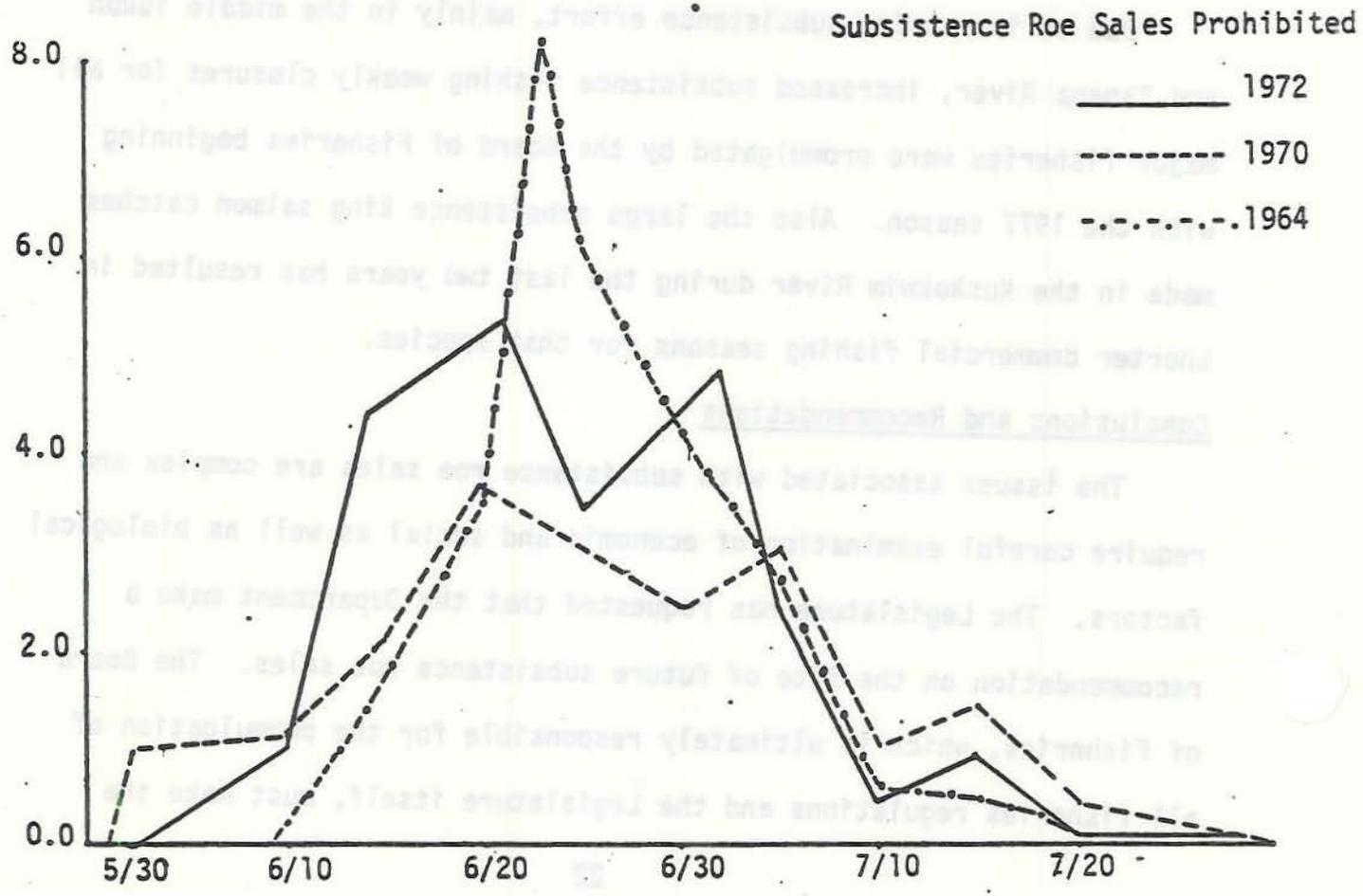
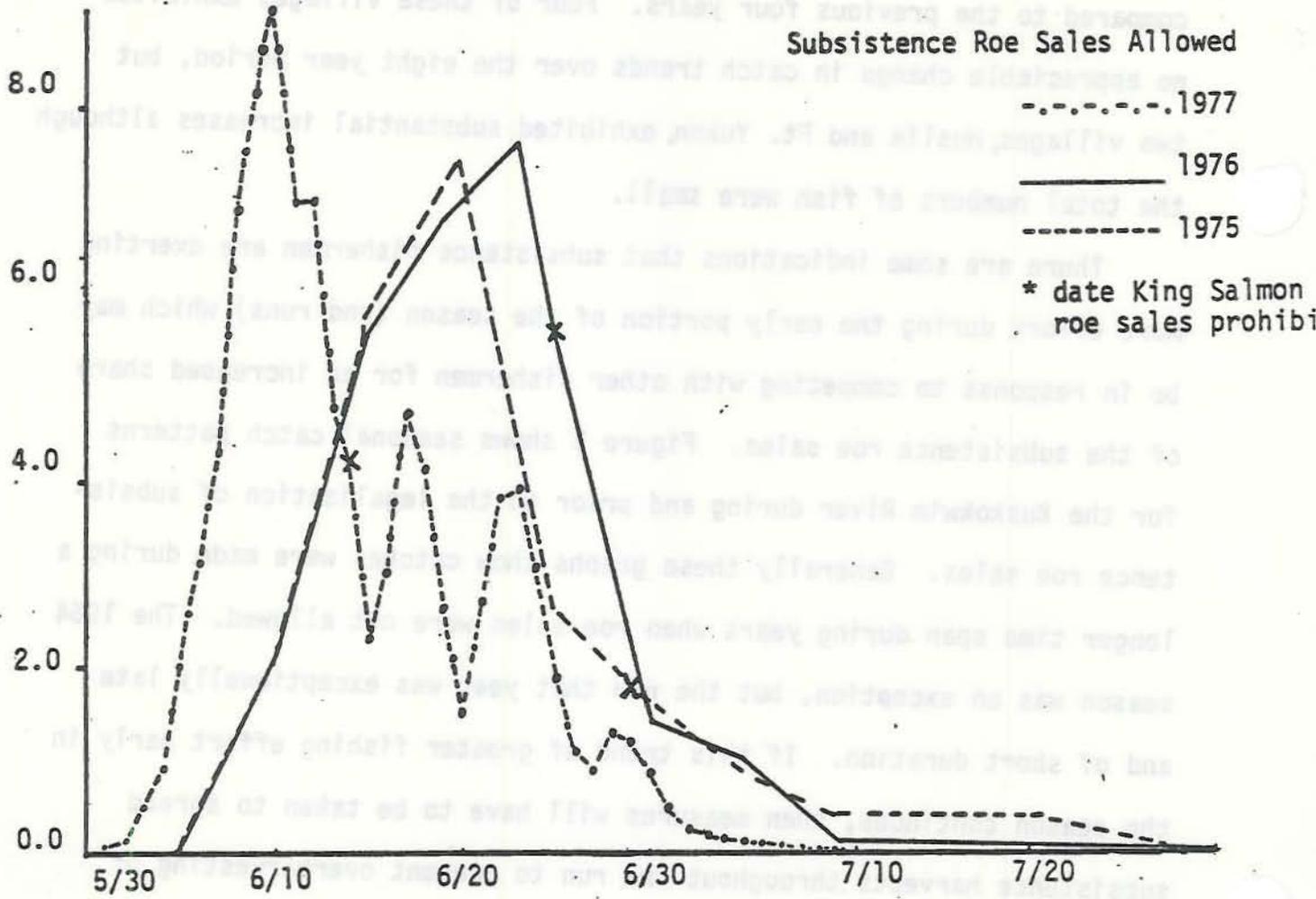
There are some indications that subsistence fishermen are exerting more effort during the early portion of the season (and runs) which may be in response to competing with other fishermen for an increased share of the subsistence roe sales. Figure 3 shows seasonal catch patterns for the Kuskokwim River during and prior to the legalization of subsistence roe sales. Generally these graphs show catches were made during a longer time span during years when roe sales were not allowed. The 1964 season was an exception, but the run that year was exceptionally late and of short duration. If this trend of greater fishing effort early in the season continues, then measures will have to be taken to spread subsistence harvests throughout the run to prevent overharvesting of specific stocks. This will require additional weekly closures.

Due to increasing subsistence effort, mainly in the middle Yukon and Tanana River, increased subsistence fishing weekly closures for all major fisheries were promulgated by the Board of Fisheries beginning with the 1977 season. Also the large subsistence king salmon catches made in the Kuskokwim River during the last two years has resulted in shorter commercial fishing seasons for that species.

Conclusions and Recommendations

The issues associated with subsistence roe sales are complex and require careful examination of economic and social as well as biological factors. The Legislature has requested that the Department make a recommendation on the fate of future subsistence roe sales. The Board of Fisheries, which is ultimately responsible for the promulgation of all fisheries regulations and the Legislature itself, must make the

Percent of Total Catch



final decision.

The opposition to continued subsistence roe sales being expressed by local residents must be given strong consideration. The first hand knowledge of persons residing year round in rural communities cannot be duplicated by occasional surveys and visits to these same communities by State employees. As previously indicated, abuses associated with the subsistence roe fishery are difficult to detect by conventional fishery surveillance methods.

Five separate proposals have been submitted for consideration at the December 1977 meeting of the Board of Fisheries recommending complete prohibition of continued subsistence roe sales. All of these were submitted by local residents or organizations representing local residents including the Lower Kuskokwim and Lower Yukon Fish and Game Advisory Committees. Two other proposals were also submitted by local residents that involve greater restrictions upon subsistence roe sales. For the first time in four years, fishermen have openly discussed problems associated with roe sales not only among themselves, but with Department biologists and Fish and Wildlife Protection officers indicating a growing unrest over this issue.

It is the Department's recommendation to the Board of Fisheries and the Legislature that the sale of subsistence salmon roe be prohibited statewide beginning with the 1978 fishing season. This recommendation is based on several factors which include:

- 1) Continuation of the sale of subsistence salmon roe will require further fishing restrictions and re-examination of the Department's policy of affording subsistence fishing the highest priority among beneficial fishery uses. A relatively few persons fishing primarily for the purpose of selling roe will adversely

affect others who are much more dependant on a subsistence livelihood.

- 2) The growing opposition by local fishermen who are the direct beneficiaries of continued roe sales, indicate that abuses associated with subsistence roe sales are more widespread and serious than indicated.
- 3) The trends of increasing subsistence catches and effort, apparently in response to profit motivation, could jeopardize future maintenance of salmon stocks especially during years of small runs.

The loss of revenues to both fishermen and processors resulting from the prohibition of subsistence roe sales can be expected to be controversial. Individual fishermen and processors will be affected differently depending on the availability of alternate resources and incomes. Although a comprehensive analysis of the economic impact of roe sales prohibition was beyond the purview of this report, preliminary analysis indicate that relatively few individuals are making substantial incomes from subsistence roe sales.

If subsistence roe sales are prohibited, attention must be focused on methods of preparation and storage of roe for local use. Salmon roe was apparently used as a foodstuff for both humans and dogs to a greater extent many years ago. Fuller use locally could result in a decrease in subsistence demands and other expenses. Sled dogs are on the increase in some villages and use of salmon roe as a dogfood supplement will reduce the need for subsistence salmon and commercial dogfood.

The popularity of subsistence roe sales in upriver areas was due partly to the limited commercial fishing opportunities existing in these areas that included small commercial catch quotas, lack of markets, and persons ineligible for entry permits. Restrictions have since been

relaxed in some of the upstream fisheries. For example, average earnings by commercial fishermen in the Anvik - Ruby area now rival those in the lower Yukon.

Prohibition of roe sales is expected to result in the stabilization or reduction of subsistence salmon catches in the near future, especially for chum salmon. If substantial catch declines occur and the biological status of the runs are unchanged, a surplus would be available for commercial harvesting. The Board of Fisheries could exercise the option of allowing the surplus to be harvested in the local commercial fishery.

Prohibition of subsistence roe sales can be expected to result in attempts at blackmarketing. Due to the small department staff, remoteness and vast size of the fisheries and the existence of subsistence fisheries within major commercial fishing areas, special steps will have to be taken to minimize blackmarketing of subsistence roe to include:

- 1) Require buyers of commercial salmon to submit weekly reports detailing production of both fish and commercial roe. The Department will continue to sample catches each week for average roe weight and sex ratio information to determine amounts of roe contained in the commercial catch. "Overages" will indicate possible illegal purchases of subsistence roe which will not be allowed to exceed established limits.
- 2) Units of processed (boxes) or unprocessed (buckets) of roe will be assigned consecutive numbers by each buyer and these units must be examined by a department representative prior to being shipped to another location.
- 3) Commercial buyers will be required to purchase both male and female salmon in the same ratio obtained from the fishing gear; fishermen will be required to follow the same conditions.

4) Temporary fishery technicians will continue to be used to monitor subsistence catches in selected communities. A coordinated surveillance program targeting commercial buyers must be worked out in advance with the Division of Fish and Wildlife Protection.

- 1) Insure buyers of commercial salmon to submit weekly reports detailing production of both fish and commercial roe. The Department will continue to sample catches each week for average roe weight and sex ratio information to determine amounts of roe contained in the commercial catch. "Overages" will indicate possible illegal purchases of subsistence roe which will not be allowed to exceed established limits.
- 2) Units of processed (jacks) or unprocessed (socks) of roe will be assigned consecutive numbers by each buyer and these units must be examined by a Department representative prior to being shipped to another location.
- 3) Commercial buyers will be required to purchase both male and female salmon in the same ratio obtained from the fishing gear. Fishermen will be required to follow the same conditions.



LAWS OF ALASKA

1975

Source

SB 451 am

Chapter No.

99

AN ACT

Relating to the sale of subsistence caught salmon eggs; and providing for an effective date.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

§ Section 1. INTENT. (a) It is the intent of sec. 2 of this Act to permit the sale or trade of salmon roe in the Arctic-Yukon-Kuskokwim District under strict permit and regulatory provisions to assure the health of subsistence economics in areas where such use will not jeopardize or interfere with the maintenance of existing salmon stocks.

(b) It is the intent of sec. 3 of this Act to control the waste of salmon resources.

§ Sec. 2. AS 16.05 is amended by adding a new section to read:

Sec. 16.05.827. SALE OF SUBSISTENCE SALMON ROE. (a) Notwithstanding sec. 940(17) of this chapter, the board may adopt regulations permitting the sale of subsistence salmon roe under conditions the board considers advisable.

(b) The board may permit subsistence salmon roe sales under (a) of this section if

(1) the accustomed contribution of salmon to particular subsistence economics will be maintained, as modified by current needs; and

(2) subsistence salmon roe sales will not jeopardize or interfere with the maintenance of salmon stocks on a sustained yield basis.

(c) No person may purchase or trade for or attempt to purchase or trade for subsistence salmon roe unless he

Chapter 99

possesses an annual permit issued by the commissioner. The commissioner may specify terms and conditions of a permit required under this section. No license, entry permit or interim permit is required for the specific act of selling subsistence salmon roe. No person may purchase or transport or attempt to purchase or transport salmon roe which he knows or has reason to know was taken in violation of this section or regulations adopted under it.

(d) If the commissioner finds that sale of subsistence salmon roe is resulting in waste of salmon carcasses, damage to salmon stocks, or circumvention of salmon management programs, he may close any or all areas to subsistence salmon roe sale by emergency order. If the commissioner finds that the subsistence catch in an area exceeds or is likely to exceed, by 10 per cent, the 1974 subsistence catch for that area, he shall close that area to subsistence salmon roe sale by emergency order.

(e) Original purchasers of subsistence salmon roe shall record information required by the department on fish tickets supplied by the department.

(f) The board may adopt regulations it considers necessary for the administration of this section. The board may delegate its authority under this section to the commissioner.

(g) A person who violates this section or a regulation adopted under it is punishable by a fine of not more than \$10,000, or by imprisonment for not more than six months, or by both.

(h) In this section, "subsistence salmon roe" means salmon roe incidentally obtained as an unavoidable by-product of lawful subsistence fishing.

Sec. 3. AS 16.05 is amended by adding a new section to read:

Sec. 16.05.831. WASTE OF SALMON. (a) It is unlawful for a person to waste salmon intentionally, knowingly, or with reckless disregard for the consequences. In this section, "waste" means the failure to utilize the majority of the carcass, excluding viscera and sex parts, of salmon which are to be

(1) sold to a commercial buyer or processor;

(2) utilized for consumption by humans or domesticated animals; or

(3) utilized for scientific, educational, or display purposes.

(b) The commissioner may authorize other uses of salmon upon request if he finds that to do so would be consistent with maximum and wise use of the resource.

(c) A person who violates this section or a regulation adopted under it is punishable by a fine of not more than \$10,000, or by imprisonment for not more than six months, or

State of Alaska
Department of Fish and Game
Juneau, Alaska

Chapter 99

by both. In addition, a person who violates this section is subject to a civil action by the state for the cost of replacing the salmon wasted.

Sec. 4. Sections 1(a) and (2) of this Act expire January 1, 1977.

Sec. 5. This Act takes effect immediately in accordance with AS 01.10.070(c).

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Approved by governor: May 29, 1975
Actual effective date: May 30, 1975

ARTICLE 8.
PURCHASE AND SALE OF
SALMON ROE

Section.

805. Sale of salmon roe

810. Salmon roe sales prohibited

5 AAC 03.805. SALE OF SALMON ROE. (a) Salmon roe incidentally obtained as an unavoidable by-product of lawful subsistence fishing may be purchased or sold only in accordance with the provisions of AS 16.05.827 and the provisions of this section and sec. 810 of this chapter.

(b) Each person who purchases or processes subsistence-caught salmon roe shall obtain an annual permit issued by the commissioner or his authorized representative. Permits must be retained in the possession of the permittee and readily accessible for inspection at all times. Permits shall be obtained by the permittee in person from a representative of the department at least 48 hours prior to purchasing or processing any subsistence-caught salmon roe. A separate permit must be obtained for each district, as described in sec. 200 of this chapter, in which purchases are made. No person may initiate any purchase of or accept any subsistence-caught salmon roe, unless that person has a valid permit for the district. Permits may designate requirements for weekly reports, roe ticket reporting, times and areas open to sale or processing and plant inspection.

(c) Purchasers of subsistence-caught salmon roe shall complete all purchases on the basis of the price per pound of unprocessed roe.

(d) Any permittee who violates the terms of his permit or any other regulation or provision of law may have his permit revoked immediately by the commissioner.

(e) Each person who purchases or processes salmon roe shall submit weekly reports to a local representative of the department containing the following information:

(1) weight in pounds by species of unprocessed subsistence-caught salmon roe purchased;

(2) weight in pounds by species of unprocessed commercially caught salmon roe purchased; and

(3) number of whole salmon by species purchased from commercial fishermen.

(f) Information required by (e) of this section must be in the form of totals for the previous week and for the entire season to date.

(g) Permittees shall record information for each purchase of subsistence-caught salmon roe on roe tickets provided by the department. All entries on the roe ticket shall be completed by the permittee. Roe tickets required by this section may not be used to record information pertaining to purchases of commercially caught salmon or salmon roe. Roe tickets required by this section shall be completed at the time the transfer of roe to the permittee is made. A copy of each roe ticket shall be given to the fisherman selling the roe and to the local representative of the department.

(h) Unless waived by stipulations contained in the permit required by this section, permittees shall comply with provisions of 5 AAC 39.130(a) and (b). Fish ticket requirements in 5 AAC 39.130(b) apply to roe tickets.

(i) All purchases of subsistence-caught salmon roe may be made only from the fisherman who

took the salmon or a member of his immediate household. No person may act as a sales agent or in a similar capacity for purposes of vending subsistence-caught salmon roe to any permittee or other person.

(j) The sale of subsistence-caught salmon roe will be prohibited by emergency order in any district or subdistrict when the subsistence salmon catch exceeds or is likely to exceed the 1970-74 average annual harvest. In no instance will the sale of subsistence-caught roe be allowed to continue in any district or subdistrict if the subsistence salmon harvest exceeds or is likely to exceed the 1974 subsistence harvest by 10 percent.

(k) If the commissioner closes any district, subdistrict, or other area to subsistence-caught roe sales, no person may initiate, enter into, or consummate any purchase agreement within the closed area for subsistence-caught roe after the closure becomes effective.

(l) No person may enter into, initiate, or consummate any purchase agreement for any subsistence-caught salmon roe in any district or subdistrict which is closed to sale of subsistence-caught salmon roe. No permittee may purchase or process roe taken from any subsistence-caught salmon which he knows or has reason to know were taken from waters described in sec. 810 of this chapter.

(m) As used in this section, "purchase" means to buy, trade for, or otherwise receive subsistence-caught salmon roe for valuable consideration. No person may give or receive without valuable consideration subsistence-caught salmon roe.

(n) In areas open to the sale of subsistence-caught salmon roe, salmon taken for subsistence purposes must be consumed by the fisherman taking the fish, or by a member of his immediate household.

Authority: AS 16.05.827

5 AAC 03.810. SALMON ROE SALES PROHIBITED. No person may sell, trade, purchase, transport, or attempt to do any of these acts with roe from subsistence-caught salmon taken from any of the following waters:

(1) all waters in the Northern, Kotzebue, Fort Clarence and Norton Sound districts;

(2) in the Yukon district, all waters listed under sec. 350 of this chapter;

(3) in the Kuskokwim district, all waters listed under sec. 350 of this chapter except in the lower portions of the Eek and Kwethluk Rivers as indicated by stream markers placed by the department;

(4) in any waters closed to subsistence salmon fishing.

Authority: AS 16.05.827

Appendix III. Subsistence salmon roe sale information by sub-area and year, Kuskokwim area, 1974-77.

	Year	Pounds of unprocessed roe		Value of sales	No. persons reporting	Av. value per person ^{1/}
		King salmon	Chum Salmon			
Lower Kuskokwim River Mouth to Akiak	1974	28,350	93,643	\$ 164,934	1187	\$ 139
	1975	19,811	40,839	\$ 91,358	977	\$ 94
	1976	53,678	65,448	\$ 256,848	987	\$ 260
	1977	29,930	80,657	\$ 407,827	929	\$ 439
	(Average)	(32,987)	(70,147)	(\$ 230,242)	(1020)	(\$ 226) ^{1/}
Mid-Kuskokwim River, Akiak - Chauthbalok	1974	3,932	4,861	\$ 11,871	160	\$ 131
	1975	2,304	16,534	\$ 28,257	128	\$ 108
	1976	6,300	27,134	\$ 69,239	227	\$ 269
	1977	17,994	31,376	\$ 203,211	290	\$ 701
	(Average)	(7,633)	(19,976)	(\$ 78,145)	(201)	(\$ 389) ^{1/}
Totals - Kuskokwim River	1974	32,462	98,504	\$ 176,805	1347	\$ 131
	1975	22,115	57,373	\$ 119,615	1105	\$ 108
	1976	59,978	92,582	\$ 326,087	1214	\$ 269
	1977	47,924	112,033	\$ 611,038	1219	\$ 501
	(Average)	(40,620)	(90,123)	(\$ 308,386)	(1221)	(\$ 253) ^{1/}
Quinhagak	1974	1,631	93	\$ 2,327	91	\$ 26
	1975	2,284	236	\$ 3,780	92	\$ 41
	1976	2,232	2,959	\$ 10,066	107	\$ 94
	1977	3,250	3,967	\$ 24,838	85	\$ 292
	(Average)	(2,349)	(1,814)	(\$ 10,252)	(94)	\$ 109) ^{1/}
Goodnews Bay	1974	488	5	\$ 666	<u>2/</u>	<u>2/</u>
Hooper Bay	1975	0	102	\$ 153	3	\$ 51
Area Totals	1974	34,581	98,602	\$ 179,798	1438	\$ 125
	1975	24,399	57,711	\$ 123,548	1200	\$ 103
	1976	62,210	95,541	\$ 336,153	1321	\$ 254
	1977	51,174	116,000	\$ 635,876	1304	\$ 488
	(Average)	(43,091)	(91,964)	(\$ 318,844)	(1316)	(\$ 242) ^{1/}

^{1/} Average sales value + average number of persons for sub-area

2/ Information not available

		Pounds of unprocessed roe		Value of Sales	Number of Persons Reporting	Value of Sales Per Person
		King Salmon	Chum Salmon			
<u>Lower Yukon</u> <u>(Mouth to Holy Cross)</u>	1974	0	4,342	\$ 3,256	35	\$ 93
	1975	612	4,908	7,296	44	165
	1976	2,253	1,830	6,286	50	125
	1977	7,143	4,585	41,766	194	215
	(Averages)	(2,502)	(3,916)	(\$14,651)	(81)	(\$181) 1/
<u>Mid Yukon (Anvik-Ruby)</u>	1974	51	25,670	20,041	91	220
	1975	45	32,478	37,401	108	345
	1976	494	38,532	48,783	126	387
	1977	2,872	29,640	81,280	222	366
	(Averages)	(866)	(31,830)	(\$46,826)	(137)	(\$343) 1/
<u>Upper Yukon</u> <u>Tanana - Upstream</u>	1974	1,701	14,613	12,236	69	177
	1975	1,300	14,787	18,500	75	246
	1976	1,377	11,303	15,880	81	191
	1977	2,582	10,497	32,698	126	259
	(Averages)	(1,740)	(12,800)	(\$19,821)	(88)	(\$225) 1/
<u>Tanana River</u>	1974	700	33,940	25,980	42	619
	1975	510	18,367	21,711	36	603
	1976	1,706	16,992	28,511	22	296
	1977	2,810	18,708	53,795	90	598
	(Averages)	(1,432)	(22,002)	(\$32,499)	(60)	(\$542) 1/
<u>Area Totals</u>	1974	2,452	79,565	\$61,513	232	\$260
	1975	2,467	70,540	84,908	263	323
	1976	5,830	68,657	99,430	331	300
	1977	15,407	63,430	209,539	632	332
	(Averages)	(6,539)	(70,548)	(\$113,847)	(366)	(\$311) 1/

1/ Average sales value divided by average number of persons for sub-area.

Appendix V.

Commercial salmon catches and fishermen values for the Kuskokwim and Yukon Rivers, 1974-1977.

Kuskokwim ^{1/}	Numbers of Fish				Totals	\$ Value to Fishermen
	King	Chum	Red	Goho, Pink		
1974	31,000	196,000	269,000	496,000	\$1,056,000	
1975	28,000	224,000	128,000	380,000	899,000	
1976	49,000	232,000	167,000	448,000	1,380,000	
1977	58,000	299,000	282,000	639,000	3,675,000	
Totals	166,000	951,000	846,000	1,963,000	\$7,010,000	
[Averages]	[42,000]	[238,000]	[212,000]	[491,000]	[\$1,753,000]	
Yukon						
1974	98,000	879,000	16,000	993,000	\$1,921,000	
1975	64,000	985,000	2,000	1,051,000	1,793,000	
1976	89,000	762,000	5,000	856,000	2,151,000	
1977	96,000	795,000	36,000	927,000	4,300,000	
Totals	347,000	3,421,000	59,000	3,827,000	\$10,165,000	
[Averages]	[87,000]	[855,000]	[15,000]	[957,000]	[\$2,541,000]	
Totals						
1974	129,000	1,075,000	285,000	1,489,000	\$2,977,000	
1975	92,000	1,209,000	130,000	1,431,000	2,692,000	
1976	138,000	994,000	172,000	1,304,000	3,531,000	
1977	154,000	1,094,000	318,000	1,566,000	7,975,000	
Total	513,000	4,372,000	905,000	5,790,000	\$17,175,000	
[Average]	[128,000]	[1,093,000]	[226,000]	[1,448,000]	[\$4,294,000]	

^{1/} Also includes catches from Quinhagak and Goodnews Bay.

