

THE SUBSISTENCE SALMON FISHERY OF  
THE LOWER YUKON RIVER

by  
Robert J. Wolfe, Ph. D.

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Division of Subsistence  
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## The Subsistence Salmon Fishery of the Lower Yukon River

### Purpose

This report describes the subsistence and commercial salmon fisheries of the lower Yukon River. It provides basic background information useful for deliberations on proposed changes in salmon fishing regulations before the Board of Fisheries in 1982. The Lower Yukon Advisory Committee is proposing a shift in the sequencing of fishing periods. Since 1961 commercial and subsistence fishing for salmon has occurred during concurrent open periods. The proposed regulation would change the system so that subsistence and commercial fishing would not occur simultaneously, but in alternating periods. An alternating schedule is the system currently operating along the neighboring Kuskokwim River.

This report provides information on the fisheries as background for the proposed changes. The lower Yukon fisheries have several unique characteristics: (1) a well-integrated system of commercial and subsistence fishing, where commercial and subsistence fishermen commonly are one and the same group; (2) a local subsistence-based economic system dependent on successful commercial and subsistence salmon catches; (3) diminishing fishing times for subsistence fishing due to regulatory changes; and (4) a fishcamp structure affected by fishing schedules. Each characteristic is discussed below. The report's sections include: (1) the economy of the lower Yukon River region; (2) the salmon fishery; (3) the effects of changing commercial regulations on subsistence fishing; (4) fishing strategies of case households; (5) effects of the proposed fishing schedule on harvest levels.

## The Regional Economy

Fishermen currently participating in the salmon fishery of the lower Yukon River (Districts 334-10 and 334-20 potentially affected by the proposed regulation) primarily reside in twelve winter communities (Table 1). The communities are small, with 1980 populations ranging from 88 to 623 persons, and are predominately Western Yup'ik Eskimos called the Kwikpagmiut. The Kwikpagmiut represent a growing population with a strong, adaptable culture, an example of the successful integration of customary and traditional sociocultural patterns within contemporary economic conditions (Wolfe 1979, 1981).

A "mixed, subsistence-based economy" supports the region. It is "mixed" in that households and communities produce both "cash" and "subsistence" incomes during the year. Cash incomes derive from the commercial sale of salmon and furs on export markets, seasonal paid employment, cottage craft industries, and transfer payments. Non-cash subsistence incomes of food and raw materials derive from the hunting and fishing of wild resources throughout the year for local use. The economy is "subsistence-based" in that fishing and hunting for local use is the most stable, reliable sector. The region has the lowest per capita cash income in the state -- \$2,737 per person, ranked 29th out of 29 census areas statewide (compared with \$11,152 per capita statewide in Alaska) (Alaska Department of Labor 1981). The most viable economic strategy for households is to invest a portion of the low and intermittent cash income into equipment used for fishing and hunting for local uses.

The pattern of the local economy is illustrated in Figures 2 and 3. As shown in Figure 2, households harvest a diversified range of renewable wild resources -- salmon, several non-salmonid fish species, seal, belukha, moose,

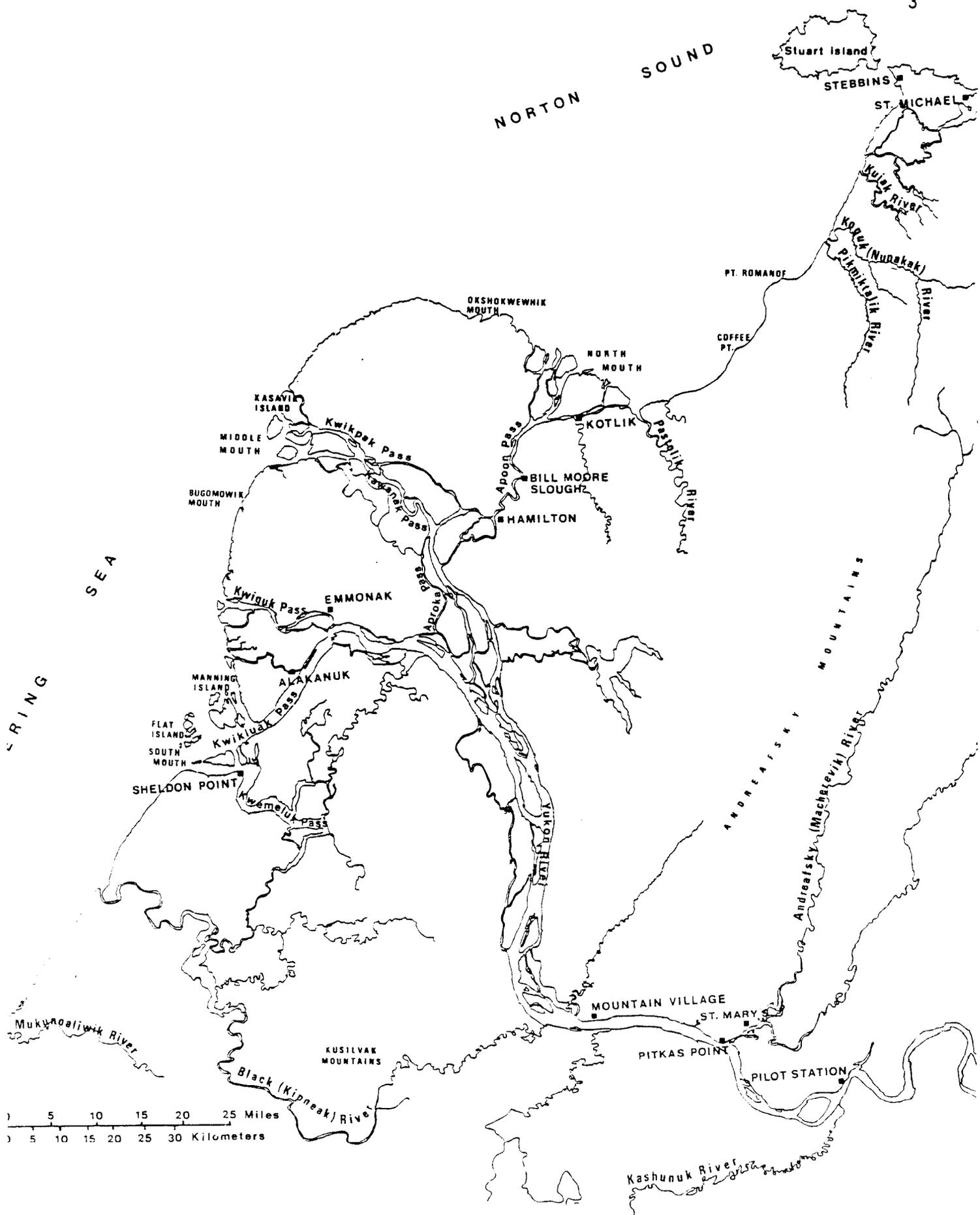


Figure 1. The Lower Yukon River Region

TABLE 1  
 POPULATION AND COMMERCIAL GILL NET PERMITS OF  
 COMMUNITIES USING THE LOWER YUKON RIVER FISHERY

	<u>1980 Population<sup>1</sup></u>	<u>334-10, 334-20 Gill Net Permits<sup>2</sup></u>	<u>Permits per Household<sup>3</sup></u>
Alananuk	522	87	.82
Emmonak	567	104	.82
Fortuna Ledge	262	47	.89
Kotlik	293	79	1.34
Mt. Village	583	101	.94
Pilot Station	325	47	.71
Pitkas Point	88	8	.44
Scammon Bay	250	37	.73
Sheldon Point	103	26	1.30
Stebbins	331	8	.12
St. Mary's	382	59	.76
Unalakleet	623	16	.13
Other	-	70	-

1. 1980 U.S. Census

2. Geiger, Andersen, and Brady 1981: Table 6, p.59

3. Estimated number of households

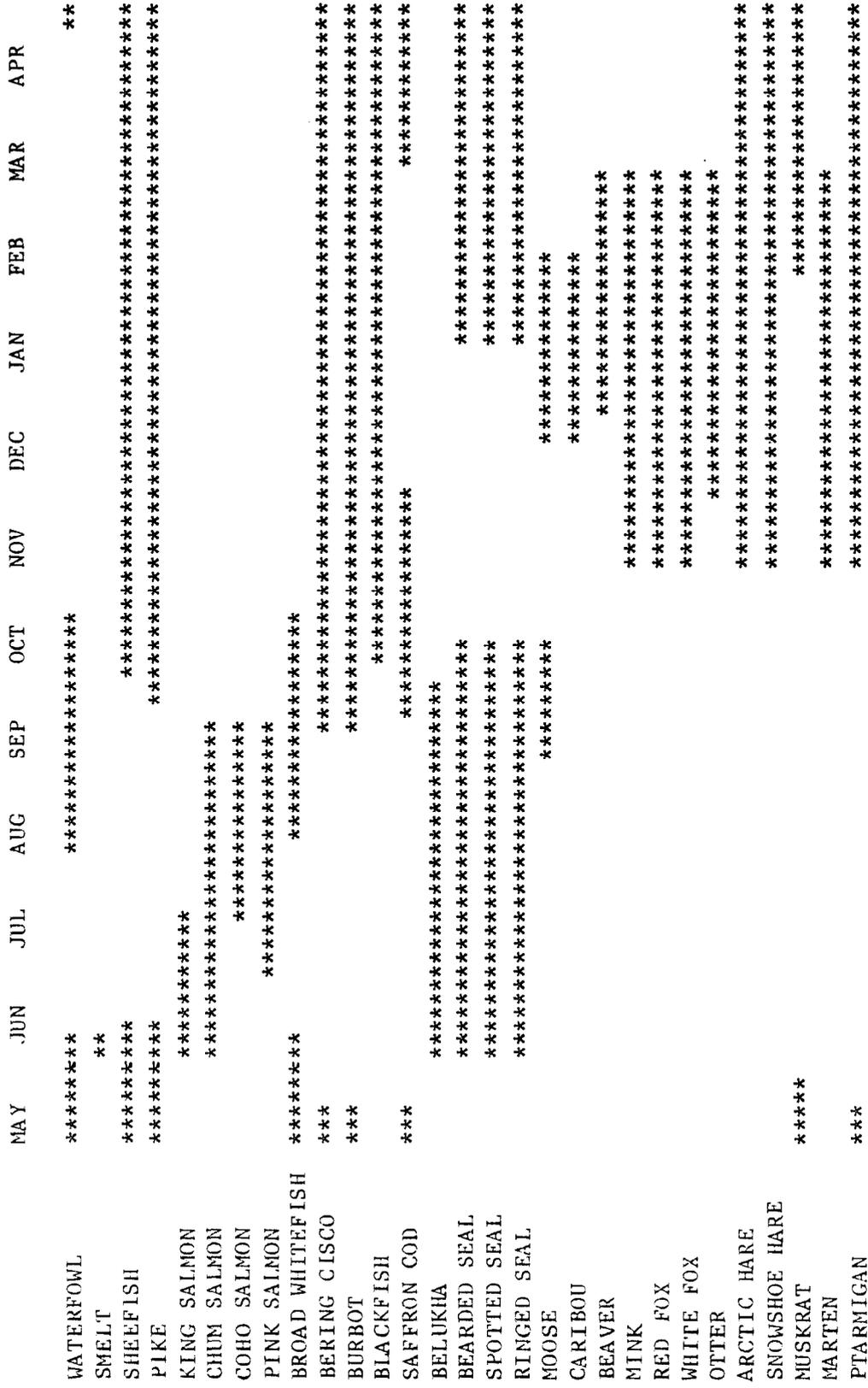


FIGURE 2. SEASONAL ROUND OF FISHING, HUNTING, AND TRAPPING ACTIVITIES ALONG THE LOWER YUKON RIVER, CIRCA 1980

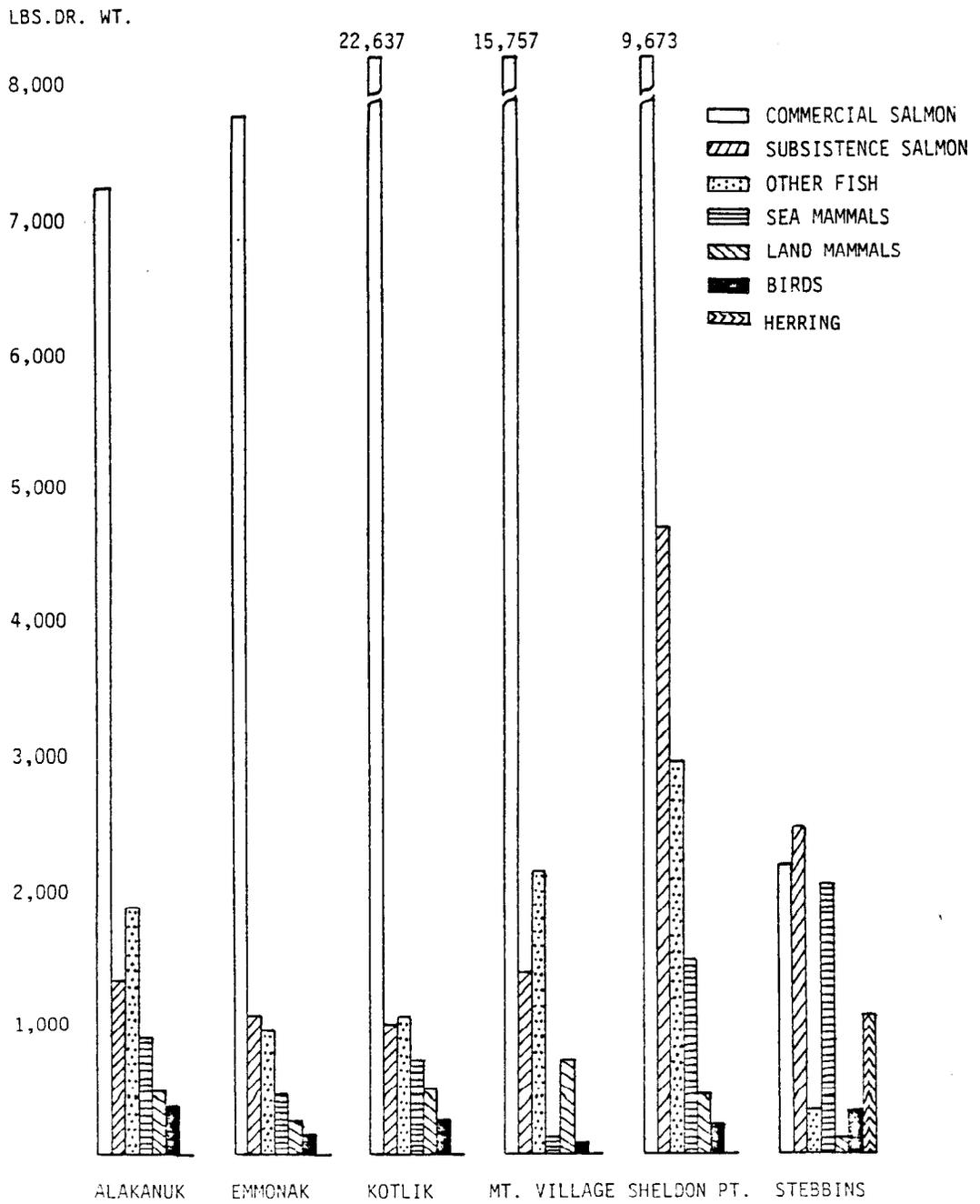


FIGURE 3. MEAN HOUSEHOLD HARVESTS BY COMMUNITY IN POUNDS DRESSED WEIGHT DURING 1980

caribou, waterfowl, small land mammals, and other birds. In 1980, a sample of households in six communities of the area produced 720 pounds dressed weight of wild foods per household member (Wolfe 1981). Figure 3 shows that subsistence harvest outputs were spread relatively evenly across resource categories. Clearly, counting both subsistence and cash incomes, these communities are not impoverished. Subsistence fishing and hunting do not represent parts of a welfare system -- they are components of a viable and successful economic system in its own right.

### The Salmon Fishery

The salmon fishery is a central component of the local economy. As shown in Figure 3, salmon comprised the largest single resource harvested by local households. From early June into September, four main species are taken -- king, chum (a summer and fall run), coho, and to a lesser degree, pink. A large portion of the salmon harvested by households with commercial permits is sold to commercial buyers; the remainder is processed by the family unit for local uses (the relative size of commercial and subsistence catches for a sample of households is illustrated in Figure 3). For those holding limited entry permits, there is no radical distinction between commercial and subsistence fishermen: they are one and the same. The person who fishes for sale also fishes for subsistence. Persons without limited entry permits cannot legally sell fish, and therefore may fish only for subsistence uses. In 1982 there were approximately .79 limited entry permits per household in lower Yukon River communities (Table 1).

Subsistence production is not an individual effort, but the activity of extended family groups. A group of persons commonly related by ties of kinship cooperate during summer in the harvesting, cutting, drying, smoking,

and storing of salmon. During summer, family groups commonly disperse from the winter communities and reorganize into a number of summer camps stretched along the banks of the region's major rivers, sloughs, and distributaries. The camps serve as bases of operation for fishing. During 1980, about half of all households moved to fishcamps, the rest fishing from the winter communities. Figure 4 depicts the 1980 locations of these fishcamps for six communities, illustrating that the delta changes from a region seemingly devoid of habitation in winter to one filled with small settlements during summer.

Fishing technologies used on the river have included weirs and hand-driven traps, dip nets, set nets, drift nets, fish arrows, and fishwheels; currently, set and drift gill nets are the preferred methods. The fishery has been managed to restrict fishing technology in such a way as to foster participation by local residents. Currently, fishermen use up to 150 fathoms of set gill net or 50 fathoms of drift gill net drifted from 17 to 25 foot plywood or aluminum skiffs with 35 to 55 horsepower engines, without gill net rollers or power reels. In the sloughs and channels near the coast, the set net is the preferred method. Commercial fishermen cannot place nets beyond a one nautical mile radius from the mouths of the major river passes. Subsistence nets commonly are set into the ocean beyond one nautical mile. Upriver, the drift net is preferred. There has been a recent trend favoring drifting over setting for commercial salmon, as drifting is the more productive method during short open periods. Increased efficiency in the fishery has been reflected in recent increases in catch per unit effort (Geiger, Anderson, and Brady 1981).

Netted fish which are to be sold are delivered to tenders moored at central locations or to commercial processors near winter settlements. Fishermen received on average in 1980 \$23.41 per king, \$1.66 per chum, and

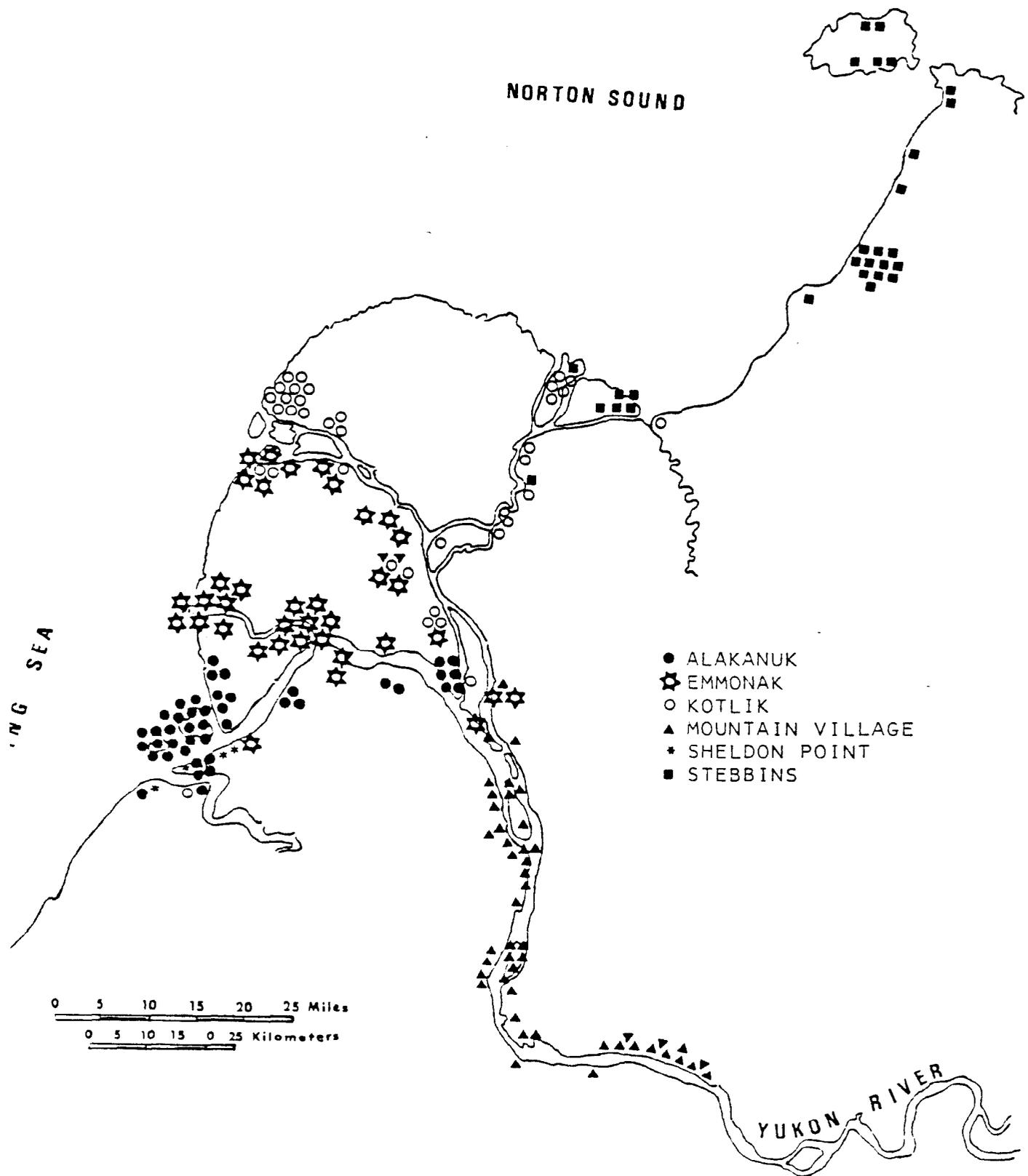


Figure 4: Approximate locations of summer fishcamps of households from Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins during 1981

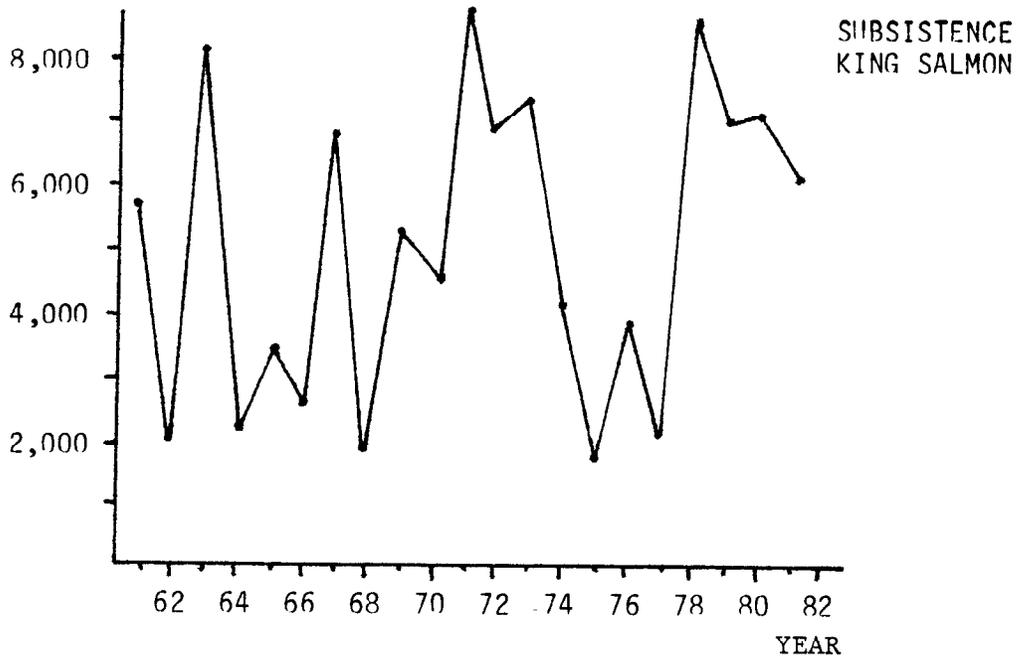
\$2.32 per coho. The 1980 commercial catch on the lower Yukon River was 143,853 kings, 950,355 chums, and 7,488 cohos, sold for an estimated value of \$4,962,559 or an average of \$7,234 per permit holder. This comprised about 75 percent of the total 1980 Yukon River commercial fishery output (Geiger, Andersen, and Brady 1981). Profit margins are not great. The cost to own and maintain a typical outfit of fishing and hunting equipment on the Yukon delta totaled about \$3,648 per year in 1980 (Wolfe 1981).

Salmon brought back to the fishcamp are processed for local use. The fish are unloaded, washed, cut into strips or steaks, and hung on open-air drying racks for up to several weeks. Transferred to plywood and corrugated aluminum smokehouses, the air-dried fish are slowly cold smoked with cottonwood for another two weeks. Processing is labor-intensive work divided among members of the domestic fishcamp group. Smoked and dried salmon are packed into buckets and barrels for storage and use throughout the nine months following summer. Many households dry heads, backbones, and tails; a smaller number dry roe. Some salmon is salted, fresh frozen, or buried in pits for fermentation. Subsistence catches along the Lower Yukon are depicted in Figure 5. Fluctuations in harvest levels primarily reflect variations in run strength and not differences in number of fishing families or degree of effort.

#### The Effects of Changing Commercial Regulations on Subsistence Fishing

Overall, commercial salmon fishing has become well-integrated with the historic pattern of fishing and hunting for local use. Fishing has been the central, traditional summer subsistence activity (Wolfe 1979). Fishing for commercial sale using traditional technologies did not represent an occupation competing with or redirecting the summer economic focus of households. Households with commercial fishing permits currently do both, selling a portion of their fish and retaining a

NUMBER  
KINGS



NUMBER  
CHUMS

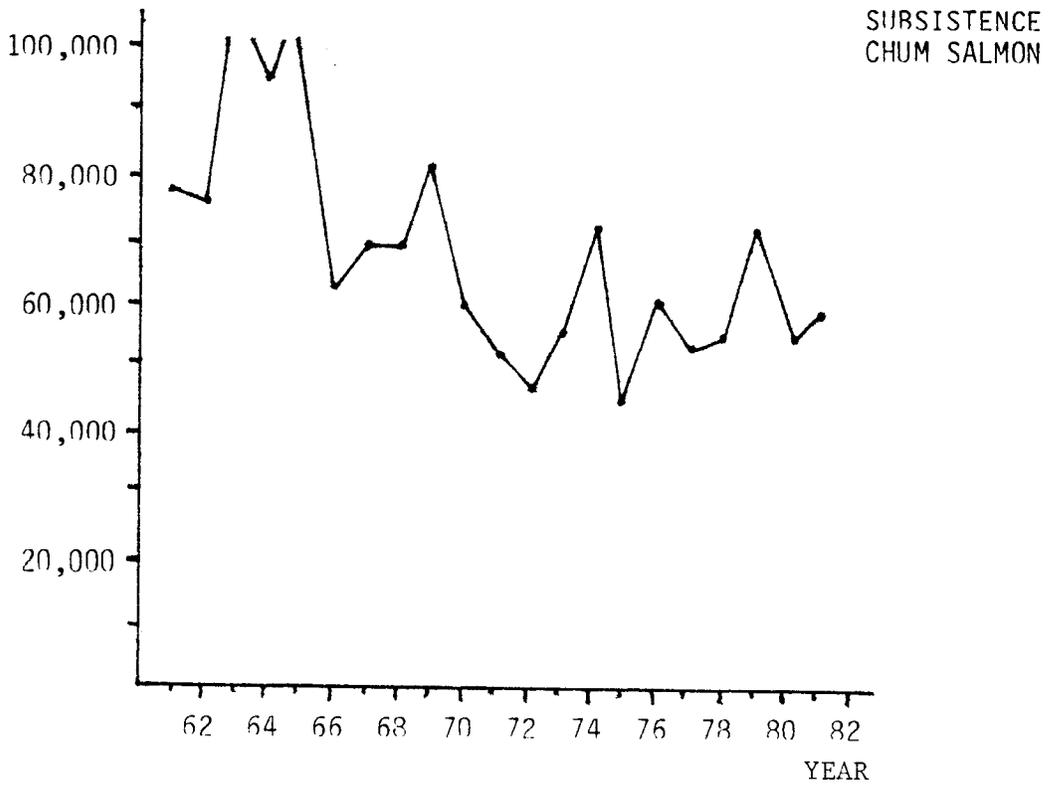


Figure 5. Comparative Subsistence Catches, Lower Yukon River, 1961-1981  
(Yukon Mouth to Owl Slough; from Geiger, Andersen, and Brady 1981:94-95)

portion for subsistence uses.

A major influence of the commercial salmon industry on the subsistence fishery has been in terms of increased time restrictions on salmon fishing by regulations. Before 1961, fishing times were self-regulated by production units, usually consisting of independent nuclear or extended families. Subsistence fishing could occur 7 days a week. Commercial fishing for kings was allowed 4-1/2 days a week until quotas were met. Fixed quotas were replaced in 1961 by a system of scheduled weekly fishing periods. For the first time, fishing for subsistence kings was tied to commercial fishing periods. Subsistence fishing was permitted only during open commercial periods. Subsistence nets had to be removed from the water during closed periods. Beginning in 1965, fishing for fall chums similarly was tied to the commercial schedule of openings and closings in 1965. It is the timing and duration of these open fishing periods that have affected the subsistence fishery.

Since 1960, the period of time for subsistence fishing has been progressively shortened. Figure 6 depicts the changes in the open fishing periods. Since 1960, subsistence fishing for king salmon decreased from 7 days a week to 4 days, 3-1/2 days, 3 days, 2-1/2 days, and currently 2 days a week. Similarly, since 1965, subsistence fishing during the fall chum and coho season has decreased from 7 days a week to 2 days a week. During the past two seasons, fishermen have had opportunities to place subsistence nets two 24-hour periods during the open commercial season. These reductions in fishing time were designed to restrict commercial harvest levels to insure adequate escapements in the face of increasing commercial fishing efficiency, not to restrict subsistence harvests (cf., Annual Management Report, Yukon Area 1968:31). Thus, regulations made to manage the commercial fishery have resulted in progressive impacts on subsistence activities.

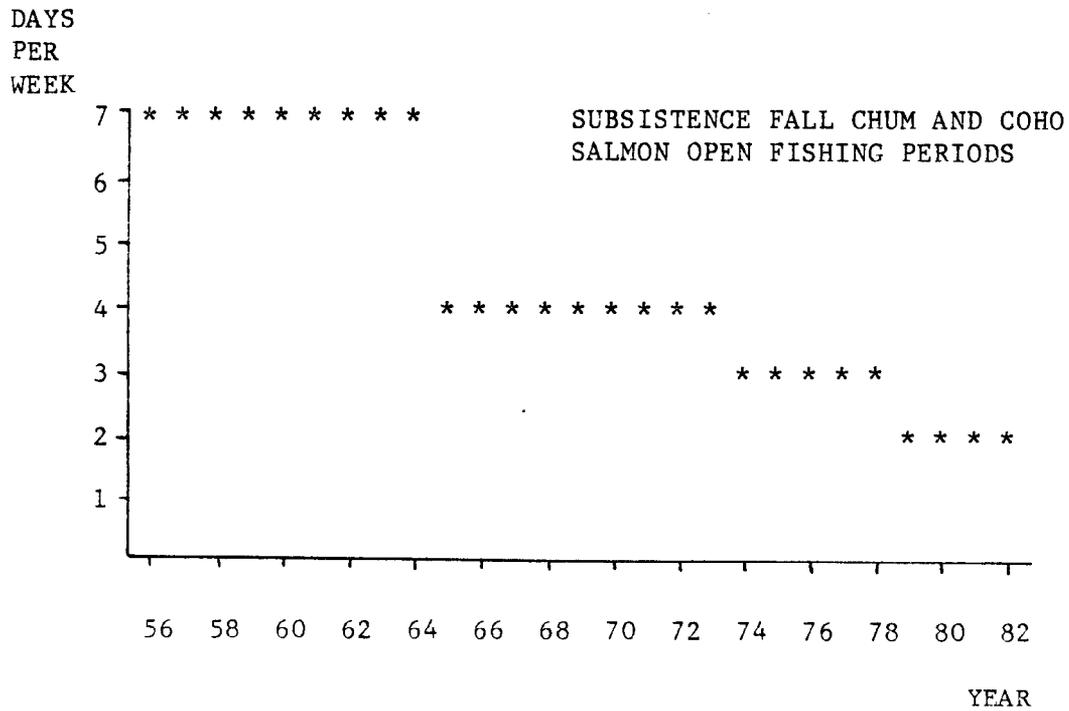
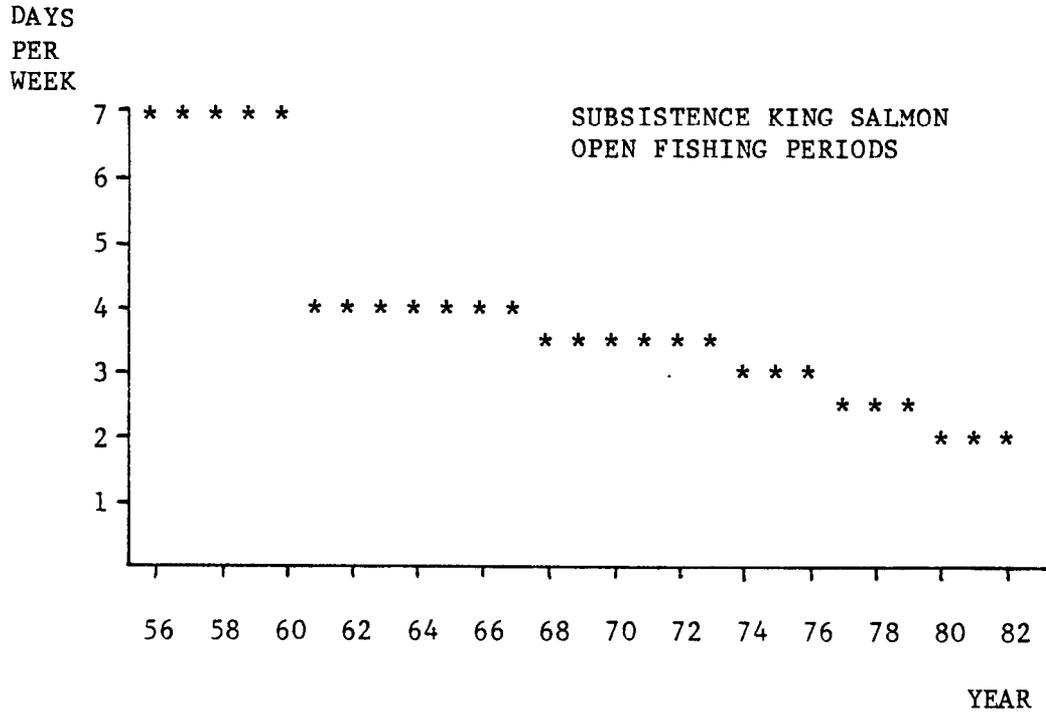


FIGURE 6. CHANGES IN OPEN PERIODS FOR SUBSISTENCE SALMON FISHING IN DISTRICTS 334-10 AND 334-20, LOWER YUKON RIVER

There is no evidence that demand for subsistence salmon for human consumption has decreased during this time period (Geiger, Andersen, and Brady 1981:13; Wolfe 1979:146). The salmon harvests for local human consumption apparently have remained relatively stable along the lower Yukon River. If anything, there is evidence that subsistence uses for human consumption have increased recently-- during 1981, the subsistence king salmon catch on the Yukon was the second highest catch on record and was exceeded only by the 1980 catch. The combined chum and coho salmon subsistence harvest was the third highest since 1964 and exceeded the recent 5-year average by approximately 20 percent (Geiger, Andersen, and Brady 1981). Increases in subsistence salmon uses might be expected considering the increasing population size in the lower Yukon River district. As children attain adult ages and join or form fishing units, greater numbers of salmon harvested for human consumption may occur. Also, the trend of decreasing dog teams evident since the early 1960s apparently bottomed in 1972 and has reversed, suggesting a potential increase in chum and coho salmon taken for feeding teams (Geiger, Andersen, and Brady 1981:13). Most of the increase seems to have occurred in the Interior; however, new teams are appearing in lower Yukon River villages as well.

These figures show that for the fishing family, there is less and less time to fish. A family is faced with decreasing opportunities in which to fill subsistence needs. Whereas subsistence demand has remained stable or has grown on the lower river, the "harvest window" for taking salmon has narrowed. The same quantities of fish must be caught in a shorter amount of time.

The following cases illustrate some of the strategies followed by families for taking salmon along the lower river. They show several techniques used for coping with shorter time periods.

Case 1

Case 1 illustrates an extended family with a commercial fisheries permit which harvested and cut fish based from the winter community during 1980. The 56-year-old father was tied to the winter community by full-time, paid employment, and could not move to his fishcamp during summer. The extended family included a mother and two daughters who lived at home, a son who lived in a neighboring house, and a daughter-in-law and two grandchildren who lived in a second house. Anticipating the short open periods during the commercial season and the extra constraints placed on his time because of his summer job, the man placed a 25 fathom net for king salmon for seven days before the opening of the commercial season in a small eddy 30-minutes from the winter village. This is a legal practice commonly done by certain households on the delta. He and his son checked the net daily, hoping to fill a part of their subsistence needs during the early stages of the king run. The fish were transported back to the village where they were cut and hung by the mother and daughters. When the commercial season opened, scheduling became more tight. Fishing periods began at 6:00 p.m.; he got off his job in time to go out in the evening with his son to drift a few hours. These fish were sold to commercial buyers. After drifting, three 25 fathom nets were set overnight, to be checked by his son and wife in the morning while he was at work. If the nets were productive, they were set again until 6:00 p.m. that evening, when they would be checked a third time. A portion of the catch was cut and added to the fish drying on their rack until it became full; the remainder were sold. This strategy of drifting after working hours and placing a set net during them was continued throughout the king, summer chum, fall chum and coho seasons. As with many fishing families, they considered the most advantageous subsistence catch strategy to be pacing the cutting and drying

of fish throughout the early part of the season. Rack size and the family's labor pool for cutting and drying limited the number of fish handled at any moment. When the first rack of air-dried salmon was transferred to the smokehouse, then more fish were retained from the catch to refill the empty racks. Keeping the fire box gently smoldering within the smokehouse was the job of the children. About three or four racks generally were prepared this way during the course of a summer by the family. Because of the short 24-hour periods, and because they were using stationary nets, success typically varied from period to period. Many periods yielded very few fish; by contrast, one set early in the year produced so many fish they twisted their net to avoid catching too many at one time. Even so, they exceeded their processing capabilities that period and gave fish away to a cousin. Pursuing this fishing strategy, this extended family processed about 80 kings, 300 chums, and 100 silvers for the winter in 1980, and sold an additional 25 kings and 700 chums and cohos, valued at about \$2,130. They considered this a poor commercial season. More fish could have been sold from their catch, but only at the expense of diminishing their subsistence salmon harvests.

### Case 2

This fishing group illustrates a strategy of establishing long tenure at fishcamp during summer. During 1980, this family cluster arrived at fishcamp soon after breakup in late May, when ice still edged the sloughs. At the camp were three households: a 51-year-old father, mother, and three children; a son and daughter-in-law with a child; and a daughter and son-in-law who resided at another winter village. Like case 1, this extended family group put up kings for subsistence use before the commercial season officially began. During commercial periods, the father, son, and a nearby neighbor pooled labor in the harvest of salmon, splitting the commercial earnings

three ways. They each harvested about 400 kings and 630 chums and cohos, valued at about \$9,150 each. They periodically removed chums and cohos from the commercial catch for drying and smoking at the camp by the women and children. The household of the father and son processed about 37 kings and 270 chums and cohos for subsistence use. The salmon was stored at the father's house and used by the son's household when needed. The daughter and son-in-law put up their own separate cache of salmon. The extended family stayed the entire commercial season at fishcamp, occasionally making the 1-1/2 hour trip to the winter village during closed fishing periods.

### Case 3

The following case exemplifies a household in transition between set netting from a fishcamp to drift netting from a mobile base. Because of the shorter fishing periods, mobility and drifting have become more efficient strategies for fishing. In comparison with a stationary set net, a drift net can be moved to productive areas during the short 24-hour period and thus can more reliably intercept salmon.

Until recently, the 47-year-old father, mother, and seven children have occupied a fishcamp on Manning Island near the coast, shared with the households of a nephew and a friend. In 1980 the nine-member household moved to fishcamp when the commercial season started. The father set his nets in ocean channels along sand bars, where there is about one foot of water at low tide. Salmon entering the Yukon passes at high tide are guided to the nets by the sand bars. Since there are usually two tides during an open period, the nets are placed twice for about twelve hours' combined time. Thus, fishing time is actually shorter than 24 hours for set net fishermen along the coast. In 1980 his family kept 20 kings from his commercial catch, and sold 77 kings and 970 chums and cohos, valued at about \$4,000. He

considered this a terrible year. Because of the poor catches, he sold most of the chums and cohos during the commercial season to maximize cash earnings. About 300 cohos were harvested for subsistence after the close of the commercial season (fishing is open seven days a week after the commercial season). This strategy of deferring subsistence catches until later to maximize cash earnings during open commercial periods entails certain risks -- wet, stormy weather frequently occurs in late August and September. Under these conditions, fishing can be dangerous and drying fish can be spoiled. In 1981, the household tried a different strategy. The father decided to drift for commercial salmon 45 miles upriver, leaving the family at the winter village. He would leave his wife and young children Monday mornings, boat upriver to fish Monday 6:00 p.m. to Tuesday 6:00 p.m., and return to the winter village Tuesday evening. He repeated the trip again to fish the open period Thursday 6:00 p.m. to Friday 6:00 p.m. After the commercial season closed, the household moved to fishcamp to put up salmon. This fishing strategy attempted to maximize fishing output for commercial sale, but with the costs of family separations, disruptions of the family fishcamp structure, and higher expenditures of time, effort, and gasoline.

#### Case 4

This case illustrates a household whose members owned no commercial salmon permit and which fished only for subsistence uses. The household is composed of a father, mother, and 8 young children. The 49-year-old father in the household is partially disabled with arthritis and ulcers; his fishing and hunting activities are restricted considerably. The household fished from the winter village in 1980. Because of the father's restricted mobility, a 12 fathom net was placed in the slough across from the village, an area which is not very productive, during the two 24-hour open periods each week. Over the season

he took only 7 kings and about 110 chums and cohos. His family ate the kings fresh, and dried the chums and cohos to fill one 50-pound barrel and two 5-gallon buckets. Because of the large size of the family, the household could have used more.

#### Case 5

This case also illustrates a household without a commercial fisheries entry permit. The 37-year-old father, mother, and three children stayed at the winter village during summer. Last year he did not fish for salmon, putting up no subsistence kings, chums, or cohos. He expressed discouragement that he had no permit, which he did not receive because of lack of qualifying points when permits were issued. He indicated he would fish if one were available ("Do you have one we can have?" he asked). Instead, he worked during summer at a modest wage-paying job (\$1,008 a month). In addition, he was considered one of the best boat builders in the community, making boats on order for people during summer. His wife stated he did not make much on the boats because everyone claimed being a relative to reduce the price. Probably his profits were about \$700 per boat. The lack of involvement in salmon fishing is not an uncommon choice among young men who are without fishing permits and unattached to families with permits. This man harvested other resources during 1980: whitefish in September; spotted seal in October; pike in March; ringed seal during April; hare, muskrat, ptarmigan during winter; and geese, duck, and crane.

#### Summary of Subsistence Fishing Practices

The five cases illustrate some common strategies adopted by families along the lower Yukon River for obtaining subsistence and commercial fish under the current schedule of open and closed periods. For fishermen with

commercial fishing permits, there is a choice each open fishing period between selling fish to commercial buyers or retaining fish for local domestic use. The common practice is to retain a portion of the catch for subsistence uses, while selling the remainder. This becomes a difficult decision certain seasons -- when fish runs and catches are low. Every fish sold is a fish taken away from one's family cache; every fish retained is money lost to the household's small annual income. As both subsistence salmon and cash income are necessary, the decision is difficult, and in certain years families may sacrifice their subsistence catch for necessary cash sales. For families without commercial salmon permits, all fish are kept. These families may be required to work at wage-paying jobs during summer for cash income; this places further constraints on a family's fishing options because of restrictions on time.

The progressively shorter open fishing periods over the past twenty years have left little flexibility to fishing families. There are only short "harvest windows" for procuring salmon. On seasons with low salmon runs, it may be difficult to fill a family's projected fish requirements during the two 24-hour open periods. Consequently, families face increasing difficulties obtaining their subsistence salmon catch during progressively shorter periods on low salmon years.

An increasingly common response to shorter fishing periods is to shift to drifting for salmon. Compared with the set net, drifting produces more salmon per unit time. Thus, a cycle is created -- shorter periods lead to more efficient drifting, more efficient drifting leads to a further shortening of open periods.

Two losers in this ever more efficient, ever shorter fishery may be families that do not drift and the family-based fishcamp system. Drifting is more costly in terms of gasoline and labor in comparison with set netting.

Those with greater cash incomes and stamina (frequently the younger fishermen) are able to compete more effectively over the poor and less physically fit (more frequently the older fishermen or those without commercial permits). Families who cannot afford to drift are less able to compete in the fishery. Secondly, the family-based fishcamp may suffer because shorter open periods discourage the establishment of traditional fishcamps, as is discussed below.

#### The Lower Yukon Fish and Game Advisory Committee Proposal

The Lower Yukon River Fish and Game Advisory Committee has submitted a proposal to the Alaska Board of Fisheries addressing fishing periods (Alaska Department of Fish and Game 1982:53). The proposal recommends modifying the system of concurrent open periods for commercial and subsistence fishing for salmon. The proposed regulation would change the schedule to alternating open commercial and subsistence periods, by allowing the taking of salmon for subsistence except for 24 hours before, during, and 12 hours after each commercial salmon fishing period. The proposed schedule would not increase time for subsistence fishing -- two 24-hour periods for taking salmon for subsistence use. However, separating the period from commercial fishing would offer flexibility to many fishing families. It would allow families with members holding commercial fishing permits to fish for commercial fish for sale and also to place nets for subsistence salmon during subsistence open periods. These additional opportunities to harvest fish would provide greater flexibility for taking subsistence fish.

#### Effects of the Proposed Schedule on Salmon Harvest Levels

As described above, the proposed regulation would change the sequencing of subsistence and commercial fishing periods from concurrent to alternating

periods. The potential effects of this schedule on salmon harvest levels depend upon several factors.

First, the harvest levels of fishermen without commercial fishing permits and who fish only for subsistence uses probably will not change significantly. The amount of fishing time for non-commercial fishermen remains unchanged at two 24-hour periods per week. Only the sequence is changed so that subsistence fishing no longer coincides with commercial fishing. There may be reduced competition on the river during these fishing periods, but it is doubtful that this will result in a significant change in the overall catch from the nets of these fishermen.

Second, the subsistence harvest levels of fishing families with commercial fishing permits may become more stable, showing fewer reductions on years of low salmon run strength. This is because the alternating schedule allows these families more options in taking fish: they can continue to take subsistence fish from their commercial catches as has been the practice in the past, or they can take fish for subsistence uses during the subsistence periods. A household's overall demand for subsistence salmon probably will not change significantly, and subsistence harvest levels for these fishermen should resemble those of most previous years with strong runs. However, during years with weak salmon runs, the choice between selling one's salmon and keeping one's salmon for subsistence sometimes results in reduced subsistence harvests for these fishermen under the existing schedule. Fishermen sell fish that in other years they would have used for subsistence. A choice is commonly made to maximize the cash utility of the limited amount of salmon at the expense of one's subsistence catch. The decision may leave the household with reduced subsistence salmon stores. The alternating schedule offers more opportunities to obtain subsistence fish, so higher subsistence catches might be expected

during lean seasons. Therefore, the regulation might result in higher average subsistence catches over several seasons by moderating the low dips in subsistence cycles (Figure 5).

There is a possibility that this group of fishermen may significantly increase their subsistence salmon harvests due to the above factors. If this occurs in response to the additional opportunities to fish, then commercial harvest guidelines may be reduced to maintain total harvests within management guidelines.

Third, commercial sales during commercial periods may increase. The regulation may reduce the need for fishermen with commercial fishing permits to choose between selling or retaining the fish they catch. This group may choose to sell a portion of their catch that previously was saved for subsistence. This may result in larger commercial sales each period, and a reaching of harvest guidelines earlier in the season. Thus, the regulation may ultimately lead to shorter commercial seasons.

Although overall demand for subsistence salmon may not increase, the timing of subsistence catches of fishermen with commercial fishing permits may change in several ways. For fishermen who fished intensively for subsistence kings before the commercial season began, and for fishermen who deferred putting up subsistence fish until after the commercial season waned, catches may be stretched out over a more extended period of time. The more flexible periods allow a more gradual pacing of subsistence harvests over the season. This change in timing may influence the types of species and the parts of the runs harvested. If it is the case that people were forgoing the cutting and processing of kings for subsistence because of the great utility of kings as a cash source, the flexible seasons may now enable fishermen to process more kings for their families. If this occurs, then there may be increases in the king salmon subsistence harvests and corresponding decreases in subsistence chum and coho

coho catches later in the season for households previously using chums and cohos as substitutes for kings. An increase in subsistence king harvests might lead to decreased harvest guidelines for commercial kings; while a decrease in subsistence late season chums and cohos might allow an increase in their commercial guidelines.

The magnitudes of any of these possible changes are difficult to predict given our current level of understanding of the fishery. If the schedule is adopted, trends probably will not be clearly recognized until after several years of adjustment to the modified system by the people along the lower river.

#### Effects of the Regulation on Fishcamps

The restructuring of regulations can induce "ripple effects" throughout the social order and the functioning of communities. One potential effect of the proposed regulation is the strengthening of the fishcamp system along the lower Yukon River.

This new regulation is likely to provide positive incentives for people to maintain the traditional fishcamp structure along the lower Yukon River. One of the indirect effects of the progressive shortening of open fishing periods over the past twenty years has been pressure on the fishcamp system. Shorter fishing periods reduce the benefits of establishing camps. Some households interviewed in 1981 indicated that it was not worth the effort to move the family to a summer camp when one could fish only 48 hours during a week. Instead, only the men of the household went to camp to fish the short periods, bringing fish back to the village for processing. Some households reported that fishcamps were not used as a base of operation at all. The fishing schedule also meant periods of inactivity at camp, and some households left

camp during closed periods to return to the winter village.

For families with a member holding a commercial fishing permit, the alternating commercial and subsistence periods offer more opportunity to place nets during the week -- 96 hours compared with 48 hours. This may create greater incentives to establish camps for fishing, and perhaps may support the traditional camp organization.

The fishcamp system produces positive social functions along the lower Yukon River. It strengthens ties between extended family members. At camp, groups of relatives of differing ages and sexes cooperate together in the harvesting and processing of fish. The enactment of complementary social roles by family members for beneficial outcomes probably promotes order, solidarity, and social well-being of family groups. By providing opportunities of purposeful, valued cooperative activity, the fishcamp system may promote the emotional and psychological health of individuals as well. Living at fishcamp is said by residents to be one of the most enjoyable, positive parts of the seasonal round. The proposed regulation change may restructure fishing schedules to be more consistent with this valued sociocultural pattern.

### Summary

Since 1961, commercial and subsistence fishing periods for salmon along the lower Yukon River have become progressively shorter. Families face increasing difficulties obtaining their subsistence salmon catch during progressively shorter periods on years with low runs. The Lower Yukon Fish and Game Advisory Committee has proposed a change in the schedule of fishing periods which provides more flexibility for obtaining subsistence salmon. Predicting the effects of the proposed schedule on harvest practices is

difficult. The schedule probably would not affect the overall demand for subsistence salmon along the lower river. However, the schedule might moderate cyclic lows in subsistence harvests over time, resulting in higher 5-year averages in subsistence catches. Commercial salmon sales per period may increase, leading to shorter commercial seasons. Subsistence salmon catches might occur earlier in the season, so that more kings and summer chums are taken for subsistence, and correspondingly fewer late season cohos are harvested for subsistence. Reductions in commercial king salmon harvest guidelines may follow if early season subsistence harvests increase markedly. The new schedule also may strengthen the traditional family fishcamp structure along the river.

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