CONTEMPORARY PATTERNS OF WILD RESOURCE USE BY RESIDENTS OF RUSSIAN MISSION, ALASKA

by

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This research was partially supported by ANILCA Federal Aid funds, administered through the U.S. Fish and Wildlife Service, Anchorage, Alaska, SG-1-4 and SG-1-5.
This study describes subsistence uses of fish and wildlife by the residents of the predominantly Yup'ik Eskimo community of Russian Mission. The community is situated 213 river miles from the mouth of the Yukon River, along its north bank. Historically, Russian Mission developed from a Russian trading post in the 1830s. Since then, its human population has fluctuated from decimation due to epidemics and from immigration of communities adjacent to it.

In 1984, Russian Mission had a population of 236 people in 49 households. Although the community has been reported as having the lowest median income of Alaskan communities in 1980 census, most households were obtaining cash, either through some form of wage employment or through commercial fishing during the study year. State-funded construction jobs provided many opportunities for wage employment in the summer of 1984. All of the 17 commercial salmon fishing permit holders sold fish in 1984.

Russian Mission residents fished for all five species of Pacific salmon. Involvement in subsistence salmon fishing was high -- 80 percent of all households cooperated in 22 subsistence salmon production units, primarily composed of parents and their adult children working together. All extended family households were involved in subsistence salmon production; extended families in multiple households also worked together. Salmon was shared with non-harvesting households.

Subsistence salmon harvests by Russian Mission residents were typical of levels for the past two decades. In 1984, salmon harvests totaled 6,267 fish or 54,809 edible pounds. King salmon were the most important species for human food, reflected by its proportion (58 percent) of the total edible weight of salmon harvested -- 135 pounds of king salmon per capita compared to 97.6 pounds per capita for all other salmon species.

The location of Russian Mission along that portion of the Yukon River was important in its high involvement and success in subsistence salmon fishing. Timing of river ice breakup, salmon abundance when they reach the Russian Mission area, and the later opening of the commercial salmon fishing season in Russian Mission contributed to productive fishing. Fish camp locations and many
productive fishing areas made for effective and efficient subsistence salmon fishing. Impacts and development of regulations addressing the commercial salmon fishery have not been as restrictive as they have been on residents of communities downriver from Russian Mission.

Moose was another important resource to Russian Mission residents. Although moose was a relatively recent arrival into the geographic areas used by residents of Russian Mission to hunt and fish, it has been incorporated into the seasonal round of subsistence activities. Like salmon fishing, household involvement in moose hunting was high (65 percent), and moose was also widely shared.

Russian Mission residents also fished for at least 11 freshwater fish species, hunted caribou, black and brown bear, ptarmigan, hare, spruce grouse, porcupine, over 20 species of waterfowl, and hunted, trapped, and snared 9 furbearer species. They also gathered many plants and berries. Geographic areas used for subsistence activities between 1980-84 encompassed approximately 6,500 square miles.
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CHAPTER 1
INTRODUCTION

PURPOSE

This report describes patterns of hunting, fishing, trapping, and gathering wild resources by residents of Russian Mission, located on the north bank of the Yukon River, approximately 213 miles upriver from its south mouth (Fig. 1). Documentation of geographic areas used to conduct these activities is included, as well. The study was motivated by the need for land use information in an area considered for mineral leasing and settlement entry by the U.S. Department of the Interior, Bureau of Land Management (BLM). The area identified is referred to by BLM as the Anvik/Bonasila/Unalakleet Planning Block (Fig. 2).

Russian Mission was selected as the study site for several reasons. First, Russian Mission is situated between areas where subsistence land use information had been recorded. The Division of Subsistence had previously recorded geographic use areas used for subsistence harvesting by the residents of Holy Cross, Anvik, Shageluk, and Grayling (Stokes 1984). Additionally, a Bethel-based non-profit organization collected wild resource use data, including land use information from residents of Marshall, the neighboring community downriver from Russian Mission (Nunam Kitlutsisti 1984). By conducting a study in Russian Mission, similar land use information would provide a relatively complete picture of harvest areas in the planning block.

Other resource use issues identified by local residents through the Lower Yukon Fish and Game Advisory Committee (LYAC) which this study attempted to address, involved salmon fishing and moose hunting. Decreasing fall chum salmon runs have been a topic of discussion since 1982 (LYAC 1983). The existing salmon fishing management regime on the Yukon River provides for concurrent commercial and subsistence fishing times, once the commercial fishing season opens (Alaska Board of Fisheries 1984). The result of this management approach has been increasingly
Fig. 2. Areas Within Bureau of Land Management's Anvik/Bonasila/Unalakleet Planning Block.
reduced subsistence fishing time as the commercial fishing times have been reduced (Wolfe 1982a). More subsistence fishing time was requested by the advisory committee and granted by the Alaska-Board of Fisheries in Districts 1 and 2 of the lower Yukon River in 1983 (Wolfe 1982a; LYAC 1983; Alaska Board of Fisheries 1983). This study documented patterns of and involvement in subsistence salmon fishing and estimated subsistence salmon harvests in summer 1984. Also, it asked whether Russian Mission residents were satisfied with the current amount of regulated subsistence fishing time in District 3 of the lower Yukon River, within which Russian Mission is situated.

Moose hunting seasons within Game Management Unit (GMU) 18 were reduced from four months to two and one-half months per regulatory year between 1981 and 1983 (Alaska Board of Game 1983). These reductions in legal hunting times, along with agency concern for moose conservation and management and locally reported intensification of moose hunting effort, presented questions regarding moose management which this study attempted to address (LYAC 1984; Nunam Kitlutsisti 1985; U.S. Department of the Interior 1984).

Moose became established in the area in this recent historic period, about the 1950s, although they were occasionally sighted before that time. Moose hunting areas of Russian Mission residents included the Kalskag and Paradise Controlled Use areas, which were created in 1977 to eliminate use of aircraft in moose hunting (discussed in chap. 4, Moose Hunting). Besides moose hunting effort and harvest levels for the 1984-85 regulatory year, this study collected information regarding the local knowledge of moose establishment in the area, moose migrations into the lower Yukon, and preferred types of moose management to meet subsistence needs of local residents.

METHODOLOGY

Approval to conduct this study was sought from and granted by city officials and residents present at a public city council meeting in May 1984. The issues mentioned as purposes for this study were of particular concern to Russian Mission residents. They were familiar with mining and were
active in commercial and subsistence salmon fishing. Their concerns resulted in strong support and active participation in this project.

Fieldwork commenced immediately and continued with intermittent visits usually lasting one to two weeks until August 1985. Important events within the annual subsistence cycle, such as "eel" or Arctic lamprey harvesting, salmon fishing, and burbot fishing were taken into consideration in timing of field trips. Telephone calls were also made to fill in data gaps as analysis and report writing commenced. A presentation of draft bluelines of the mapped land use areas was made in the community in August 1985 at which time more information was gathered.

Information in this report was gathered through both systematic and informal interviews, mapping sessions, surveys, direct observations, participation, and a literature review. A current household census, genealogy, and employment list was compiled with local assistance at the onset of fieldwork. Field research was conducted by a Subsistence Resource Specialist II and Fish and Game Technician III from the Bethel office of the Division of Subsistence. Both were bilingual in Central Yup'ik Eskimo and English; interviews with elders and mapping sessions were conducted primarily in Yup'ik. The senior researcher designed the research project with revision and direction from supervisors and the Research Chief of the Division of Subsistence. Data analysis and compilation was done primarily by the senior researcher, who is responsible for the content of this report.

Twelve households were identified by city council members and other residents as possible key research participants which had members who had been active harvesters and were noted to harvest a wide range of resources. Some changes were made in the recommended sample after initial interviews with elders were conducted to gather genealogical and ethnohistoric information. In 1984, the population of Russian Mission was composed of original Russian Mission residents, that is, people who were born and raised there; and those who had moved in, primarily as groups from two now abandoned, but former year-round settlements -- Ohogamiut and Paimiut (Fig. 1). The changes in the sample (two households were substituted and one other was added) were structured to ensure that representatives from the former residents of these now abandoned communities were included, in the event that they used different areas to harvest resources. Additionally, plans were being made in 1984
to resettle Ohogamiut (Nick 1984). Some knowledge of areas used when they resided in the former settlement was considered useful as a means to predict where they would possibly harvest resources.

As a result of restructuring, the sample (13 households comprising 24 percent of the total community households) included nearly equal representation from all three segments of the community. These households were the main source of information on geographic areas used for subsistence (primarily over the five-year period from 1980 through 1984), seasonal round of subsistence activities, and methods of harvesting and processing. General information in land use prior to movement (ca. 1950s) to Russian Mission from Ohogamiut and Paimiut residents was collected from them as well.

The methodology of mapping of geographic use areas was modeled after the "individual interview" technique described by Wolfe (1982b). Basically, researchers interviewed members of sample households in their own homes or made arrangements to use the city council office. Usually, a husband and wife team, and sometimes an elder son or daughter, were present during mapping. Each interview took from one and one-half to three hours, with short follow-up interviews lasting less than one hour in several cases. Each resource category was marked in different colors or symbols on a piece of clear acetate placed over a U.S. Geological Survey (USGS) topographic base map (scale 1:250,000 and 1:63,000). Eighteen to 27 categories were differentiated, depending on the household interviewed. Each resource category was compiled from each household biography to develop community-based presentation of areas used to harvest each resource. Several resource categories were combined ("small game" included ptarmigan, grouse, and hare; "fur bearers" included wolf, wolverine, fox, mink, land otter, lynx, muskrat, and beaver; and "berries" included all berry species) in final blue lines to make the presentation and comprehension of land use information easier.

In October 1984, a draft map of the use areas of the 13 households, using 17 resource categories, was presented in the city office for residents to review for a two-week period. This draft map was also used in the initial public hearing which BLM conducted to present their information and solicit input regarding the Anvik/Bonasila/Unalakleet Planning Block in October 1984. One household contributed new information at that time. Later, in August 1985, draft blue lines of the
mapped land use areas were brought to the community for review. Additions and revisions were incorporated both from the original sample and from at least seven non-sample households. Further, two other non-sample households thoroughly reviewed the information to conclude that all their uses were represented. With two community reviews, and incorporation of information from at least 9 additional households, the mapped data reflected areas used by at least 41 percent of Russian Mission households from 1980 through 1984.

Other data collection efforts included gathering information on salmon and moose harvesting activities. These data were collected from key members of all households who fished for salmon in 1984 and hunted moose in the regulatory year 1984-85. Survey instruments for salmon and moose harvest data collection were developed for this project (Appendices 1 and 2).

The salmon harvest survey was administered at two points in time. The first contact was made in late July after all king salmon and most summer chum salmon were harvested and processed. Three fishing families were not contacted at that time because the distance to their fish camp locations was too far to reach by boat during the late July field visit due to time constraints. A field trip in late September through early October was made to fill in data gaps and to record harvest levels for fall chum, coho, and pink salmon.

Information on sharing of dried salmon products was collected systematically in October 1984 and January 1985 during moose harvest surveys. Most (8 of 10) of the households not involved in subsistence salmon production were asked if they received salmon from another family in Russian Mission in winter 1984-85. Additionally, many households that produced dried salmon products were asked if and with whom they shared those products. Researchers presented the data collection as an attempt to determine if salmon was to be used by the entire community, so as not to single out particular families, because admission of giving was, in some contexts, viewed to be boastful.

The moose harvest survey (Appendix 2) was also administered at two periods. The first survey was after the fall hunting season (September 1-30) in Game Management Unit 18. The second survey for moose harvest data was conducted after the winter hunting season (November 15-December 31) in January 1985.
ENVIRONMENTAL SETTING

Russian Mission is situated on the north bank of the Yukon River on terraces of a south-facing slope of a bluff (Fig. 1). It is along a stretch of the Yukon River that flows in a north-south orientation. In this area, the west side of the Yukon River is composed of several small ranges of hills and mountains between Marshall and Anvik. These are part of the Nulato Hills (Orth 1971:2), but are locally referred to as the Andreafsky Mountains. The bluffs on this bank form a backdrop for the intermittent flat flood plains, which are ribboned with sloughs and oxbow lakes. Much of the terrain is less than 1,000 feet in elevation with some hill and mountain peaks rising from 1,000 to 2,000 feet above sea level (Selkregg 1976). Northeast of Russian Mission is Mount Chiniklik (Cingikkegiq\(^1\), meaning "one with a good point"), the highest peak, with an elevation of 2,615 feet. The vegetation on the lower elevation of these hills is characterized as upland spruce with patches of alpine tundra and barren ground at higher elevations. Downriver from Russian Mission, a section of moist tundra cuts across the peninsula formed by a wide bend of the Yukon River, called Devil's Elbow (Selkregg 1976).

In contrast to the west side, the east bank is essentially flat with numerous lakes and sloughs. The vegetation along the river consists of bottomland spruce and poplar, with pockets of high brush and lowland spruce. Further from the Yukon River and southward toward the Kuskokwim River, vegetation develops into wet tundra, which is prevalent throughout the Yukon River delta.

The broad vegetation types within the area used by Russian Mission residents described below are comprised of a more varied patchwork of different vegetation types due to local variation of the topography, orientation of slopes, drainage of soils, as well as the effects of forest fires. The various microenvironments provide a rich resource base.

The climate is characterized as subarctic, with a strong maritime influence (Darbyshire and Associates 1979). Winter temperatures ranged between 30 degrees Fahrenheit to -20 degrees with occasional lows to -60 degrees. Average summer temperatures were in the 60s with highs to the mid-

\(^1\)Italicized Central Yup’ik Eskimo terms in this report are spelled using the orthography developed and used by the Alaska Native Language Center of the University of Alaska in Fairbanks (Reed et al. 1977).
80s and lows to the mid-30s. Mean annual precipitation was approximately 20 inches, 7 to 8 inches of that being snowfall (roughly 10 inches of snowfall is equivalent to 1 inch of water or precipitation) (Darbyshire and Associates 1979). Freeze-up generally occurred between late October and mid-November and breakup between mid-May to mid-June (Selkregg 1976).

The Russian Mission area was characterized as possessing conditions minimally compatible for gardening. Namely, it had marginally suitable soils (relatively well-drained with variable, but more commonly, discontinuous, permafrost) and warm temperatures sustained over an adequate growing season (Selkregg 1976).

Spring ice breakup, and less frequently, fall storms, present the potential for flooding. Portions of the community on lower elevations, as well as the State-maintained landing strip, have been inundated by flood waters in recent years. Additionally, fish camps along the river bank have been razed by suddenly released ice jams and ice floes forced upon the river banks by high water as occurred in spring 1985 when four fish camp sites were destroyed by ice.
CHAPTER 2
COMMUNITY CHARACTERISTICS

HISTORICAL BACKGROUND

To date, little prehistoric research has been conducted in the Russian Mission area except for Nelson's (1979 [1899]) cursory visit and partial listing of old settlement sites and ruins in the 1870s and Hrdlicka's (1930) survey of the Yukon River in the late 1920s. Hrdlicka reported 17 "pre-Russian" sites along the Yukon River between Paimiut and Marshall. According to elderly residents of Russian Mission in 1984, residents of those sites contributed to the contemporary composition of the Russian Mission population through their descendents. Paimiut was relocated several times, consequently, there are, in fact, only 13 different "pre-Russian" settlements that are of concern here. In the immediate vicinity of Russian Mission, Hrdlicka (1930) reported two sites, Gurtler's and Russian Mission, which are discussed below.

Table 1 shows the major settlements along the stretch of the Yukon River from which Russian Mission has drawn its population over the last 150 years, as listed from the earliest historical record (Zagoskin 1967 [1847]). This list is based on information recorded during this study and the historical literature. Available population figures are also included. By and large, the lack of population data for any settlement reflects the abandonment of the settlement, generally a result of population loss through epidemics, and subsequent relocation of survivors to other settlements. In addition, the 1843 recorded population in the area had already been reduced by the smallpox epidemic of 1838 (VanStone 1959, 1979; Zagoskin 1967 [1847]). Even after the epidemic, the population was almost 50 percent more than the 1984 population of Russian Mission, which is the major, although not the single, culmination of those historic populations (Table 1). For example, Marshall, below Russian Mission, and Lower Kalskag, along the middle Kuskokwim River, were reported also as destinations for some residents of the former settlements. There was intermarriage between Russian Mission residents and people from
TABLE 1. POPULATION TRENDS OF SETTLEMENTS IN THE RUSSIAN MISSION REGION, 1843-1984

<table>
<thead>
<tr>
<th>Year</th>
<th>Russian Mission (Iqugmiut)</th>
<th>Paimiut (Paimiut)</th>
<th>Ohogamiut (Iqarmiut)</th>
<th>Dogfish Village (Iqallitviggmiut)</th>
<th>(Naugluaq)</th>
<th>Total</th>
</tr>
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<td>123</td>
<td>130</td>
<td>45</td>
<td>60</td>
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</tr>
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<td>31</td>
<td>46</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
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<td>89</td>
<td>--</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
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<td>--</td>
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<td>27</td>
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</tr>
<tr>
<td>1920</td>
<td>90</td>
<td>89</td>
<td>--</td>
<td>--</td>
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</tr>
<tr>
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<tr>
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<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

NOTE: Unless otherwise noted, absence of data (two dashes) indicates that settlement was most likely abandoned as a permanent settlement after last census entry.

aZagoskin 1967 [1847].
bBlack 1984.
c"Christians" only as reported in Black 1984.
dRollins 1978.
ePopulation not recorded in Rollins (1978).
gThis study.

the portage area of the middle Kuskokwim River in the 1850s, according to Netsvetov (1984 [1860]), a resident Russian Orthodox priest. This practice resulted, in part, from increased interaction between
the Yukon and Kuskokwim river residents that came about with Russian exploration and trade and arranged marriages among those of the Russian Orthodox faith (Netsvetov 1984 [1860]).

1830-1899

The early recorded history of the Russian Mission area is associated with the development of the Russian fur trade and introduction of the Russian Orthodox religion to the people of the lower Yukon and Kuskokwim River regions. Its proximity to several precontact portage routes between the Yukon and Kuskokwim rivers made it an important traditional trade conduit (Zagoskin 1967 [1847]) and attracted attention from these outside agents.

As part of its reconnaissance program to understand the existing Native trade networks and expand to more profitable areas for its fur trade, the Russian-American Company dispatched exploration parties in the early 1800s to areas north of the Alaska Peninsula (VanStone 1959, 1973; Zagoskin 1967 [1847]). Glazunov led several of these explorations in the 1830s into the Yukon-Kuskokwim area from St. Michael, which was then a Russian fort and trading post. Glazunov's second trip in 1835 took him to the Russian Mission area. He chose Russian Mission as the site for the trading post, which was established the following year. He selected it because he received "a friendly reception" there and "the people possessed many beaver pelts," even though Anvik "had already been decided upon" the previous year as the site for the trading post (Zagoskin 1967 [1847]).

The establishment of the trading post at Russian Mission, which was the first one along the Yukon River, signaled the beginning of sustained contact between non-Natives and indigenous people. In spring 1839, the Russian Mission post was attacked, its personnel massacred, and buildings destroyed by Natives from the Kuskokwim River area who blamed the Russians for the smallpox epidemic which began that winter (Black 1984; Oswalt 1966; VanStone 1959, 1978, 1979). The post was reoccupied in fall 1840 (Zagoskin 1967 [1847]) and continued until summer 1846, when the Russians dismantled the buildings and used the materials to build a trading post further downriver at
Andreafsky. Russian Mission became a subordinate post and collection point for furs trapped during the winter until 1867 (Black 1984).

The site of the trading post, which is the same as the contemporary site of Russian Mission was reported by elderly residents to have been a Native fish camp, functional at the time of first non-Native contact. The "pre-Russian" site that Hrdlicka (1930) called "Gurtler's" corresponds to Kangiqcuk which is approximately one-half mile upriver from Russian Mission, on the same side of the Yukon River. The place-name Kangiqcuk, meaning "a little bit of a bay," refers to a ravine between two bluffs that provides a sheltered cove. The bluff downriver from Kangiqcuk is called Iquk, meaning "end or tip," such as the end of a ridge or bluff. It was from this word that the Yup'ik name for Russian Mission, Iqugmiut is derived as discussed below. The word was spelled "Ikogmiut" by the Russians and subsequently, usually appeared in that form in the literature.

According to oral tradition, Kangiqcuk was the site of the permanent Native settlement until the smallpox epidemic, which began in 1838. The population was wiped out, except for one couple. The couple left death-ridden Kangiqcuk behind and relocated downriver to the point of the bluff. They were referred to as "Iqugmiurtuuk," meaning the "two poor, dear inhabitants of Iquk."

Without the postbase meaning "two poor dears" (-luuk), the reference to that couple yields the place-name of Russian Mission: Iqugmiut, which was the site of their new home. It means the "inhabitants of the settlement at the end or tip." Nelson (1967 [1899]) misapplied the name to refer to the entire Yup'ik Eskimo population of the Yukon River from Paimiut to the mouths of the Yukon, implying a "tribal" designation that did not exist (Wolfe 1979). The usage of Iqugmiut in this report applies only to the community of Russian Mission (Oswalt 1979).

Although more research and translations of Glazunov's travel log will likely provide further information, there is support for the local belief that Kangiqcuk was a permanent Yup'ik settlement and Russian Mission a fish camp site at the time of initial contact (Fig. 1). The first recorded use of the place-name "Ikogmiut" was in 1842 and was used to refer to the Yup'ik village associated with the Russian trading post (Zagoskin 1967 [1847]; Orth 1971). This was seven years after Glazunov's exploratory visit in 1835. Also, it seemed to be common practice to build Russian trading and/or
military establishments some distance from Native settlements. For example, the fort at St. Michael was not only a short distance from the Native settlement, it was surrounded by a palisades (Zagoskin 1967 [1847]). Fort Kolmakov along the Kuskokwim River was built opposite from the Native settlement of "Kvygympaynagmyut" (probably Kuyugem Paingarniut, meaning "inhabitants of the settlement of the mouth of the river") (Zagoskin 1967 [1847]). In accordance with these practices, the Russians may have erected the trading post a short distance from the Native settlement of Kangiqcuk. Although "I-kog-mute" was listed as a "pre-Russian" site, Hrdlicka (1930) described burials only "from Russian time" unearthed there, supporting its role as a fish camp prior to and at the time of non-Native contact. It became a permanent settlement after the smallpox epidemic of 1838 depopulated Kangiqcuk and the Russian trading post was established. In 1984, Kangiqcuk was a fish camp site used by several Russian Mission families.

Subsequent exploratory trips by members of the Russian-American Company were made into the lower Yukon and Kuskokwim rivers. Zagoskin (1967 [1847]) used the Russian Mission post as headquarters in 1843 at which time he reported 92 inhabitants in 5 winter houses (Table 1). Among other activities, the "Ikogmyut" were reported to have established traditional trade networks with lower Kuskokwim residents; the people of the inland tundra between the Yukon and Kuskokwim rivers, the Akulmiut ("Agulmyut"); and the people of the southern Norton Sound, the Pasturlimiut ("Pastol"). The Iqugmiut traded dried or frozen fish and wooden utensils that they produced to Pasturlimiut who gave them "laftak" (bearded seal skin used for boats and boot soles) and fats, primarily sea mammal oil. In turn, as middlemen in the Native trade network, they used some of the products they got from the Pasturlimiut to trade with the Akulmiut for furs (Zagoskin 1967 [1847]).

Russian Orthodoxy was exposed to the people of the Yukon-Kuskokwim delta region in the early 1830s in conjunction with establishment of redoubts (fortified trading posts) along the Kuskokwim River at Fort Kolmakov and at St. Michael on Norton Sound (Smith 1980). Natives from various places congregated at the redoubts to trade and came into contact with visiting priests who were there to provide services to redoubt personnel (Smith 1980; Black 1984).
The first resident priest at Russian Mission, Iakov Netsvetov, arrived in summer 1845, in time “to learn...about local conditions and possible subsistence means” from trading post personnel who were scheduled to relocate to Andreafsky in 1846 (Black 1984). Under his direction the first Russian Orthodox church along the Yukon River was constructed at Russian Mission in 1851 (Oswalt 1963; Black 1984). The church has since been rebuilt three times, most recently in 1980 (Smith 1980).

Netsvetov stayed in the region until 1863 and kept journals of his activities, most of which have been recovered and translated. His journals provide a rich source of information on local resource uses and timing of harvest, variations in resource abundance from year to year, and related climatological data. He also described seasonal movements of and relations between Native groups, including intergroup ceremonies and sharing patterns, and the development of Christianity in the areas he serviced (Black 1984).

Information in Netsvetov’s journals is extensive relative to the settlement of Russian Mission and its vicinity. The possibilities for comparisons and contrasts between how things were then and in the 1980s are many and beyond the scope of this report. However, the discussion below includes data from Netsvetov’s journals, where appropriate. For example, the relative decrease in caribou and the increase in moose populations in the lower Yukon River area since the mid-1800s, and the timing and abundance of salmon differed between when Netsvetov (1984 [1847]) resided in Russian Mission and what this study found. Also, an influenza epidemic in winter of 1851-52, which affected the people of the entire Yukon-Kuskokwim delta and was responsible for at least seven deaths in Russian Mission was described by Netsvetov (1984 [1860]).

About the time of the purchase of governing rights to Alaska by the United States in 1867, trading post materials and functions were transferred back to Russian Mission from Andreafsky and even from Fort Kolmakov along the Kuskokwim River (Whymper 1869; Oswalt 1963). Therefore, by 1870, Russian Mission again was the primary trading post site along the lower Yukon River.

There is little historical information relative to Russian Mission until around the turn of the century when activities related to gold exploration and steamboat services increased in response to population influx into the territory. In 1984, elderly residents recalled their grandparents collecting
timber to sell to steamboats in the late 1890s and early 1900s. After the Nome gold rush in 1898, trading for dried salmon to men who transported mail by dog team for dog food developed as another commercial activity in which some area residents participated.

1900-1939

There was widespread loss of life in the entire lower Yukon-Kuskokwim River region due to a combined measles and influenza epidemic in early to mid-summer of 1900 (Wolfe 1982c). Elderly Russian Mission residents reported that survivors from many small settlements consolidated into larger ones after the epidemic, such as those from Dogfish Village (Iqallivigmiut) (Table 1) who relocated to Russian Mission. After the epidemic, the people continued to use their former, year-round settlement as a fish camp in the summer. Before the epidemic, Russian Mission had a population of 166 persons in June 1900 (Rollins 1978). In that same summer, after the epidemic had begun, a medical doctor on board the Revenue Cutter Nunivak reported that Russian Mission had 40 people, but that the population swelled to 250 in the winter (White 1904). Whether the population increase in the winter was due to immediate consolidation from other devastated settlements is unclear. The difference between the summer and winter populations in 1900 was probably due to a combination of dispersal in fish camps and convergence after the epidemic.

Intergroup relations between communities that contributed members to the current Russian Mission population were sustained since at least the turn of the century, according to key respondents. In other words, the communities they celebrated ceremonies with and obtained spouses from have remained virtually the same throughout this century. Although these same communities and their associated seasonal camps were described as having similar intersettlement ceremonial and social relations with Russian Mission between 1845 and 1863 (Netsvetov 1984 [1860]), interpretations of the nature of these interactions should be made cautiously. There were many changes after the 1900 epidemic, as well as the influence of the introduced religion, which affected many aspects of Native life. Nevertheless, the following communities figured prominently in the recent (post-1900) local oral
history of Russian Mission: the former major settlements of Paimiut and Iquarmiut (Ohogamiut) and their satellites, such as Akirvik, which has eroded away, and Nuugluaq; Ingrirarnmiut and Takcarnmiut downriver from Russian Mission; and less frequently, Ayumqeryaraq along the Kuskokwim River (predecessor or another name for Qalqaq or Lower Kalskag) (Fig. 1). The former residents of Ingrirarnmiut and Takcarnmiut resided primarily in Marshall in recent years, according to local respondents.

There were other outside influences after the 1900 epidemic, such as gold mining. Gold was not discovered in the area until 1913 in Wilson Creek near Marshall (Berg and Cobb 1967). Subsequently, productive placer mines were operating along Wilson, Willow, Kako creeks, and their tributaries. Besides gold, heavy minerals such as platinum, iron, and titanium were mined (Berg and Cobb 1967; Cobb 1973). Mining brought in relatively few people, as the lode deposits were not large compared to those at Nome or Iditarod (Kennedy 1980). More importantly, local residents have had long exposure to mining on Kako Creek and its tributaries by some individuals who have moved into Russian Mission or live near their claims.

Although it was not as devastating as the 1900 epidemic, an influenza epidemic in 1921 resulted in more deaths and additional population shifts. At least one small settlement, Akirvik, which was between Russian Mission and Iquarmiut, was abandoned. More significant for traditional social relations and residence patterns, the use of the qasgiq or men's house declined as elderly people died, until the early 1930s when it functioned predominantly as a "visitor's house."

Most elders contributing information to this study were children during the early half of this century, and had interesting views on the place of their particular Yup'ik society from that time. Russian Mission elders described their relations with neighboring Yup'ik societies, the Akulmiut, (the "tundra people" in the contemporary communities of Kasigluk, Nunapitchuk, and Atmautluak), Kuigpagnmiut, (Yukon delta communities), and Athabaskan Indians adjacent and upriver to them as consistently "even" through historic time. Russian Mission respondents said they have always been "humble" toward their neighbors, welcoming them to use their area for specific resource harvesting activities, such as moose hunting and pike fishing. However, they did note that invitations were
primarily extended and received by individuals in neighboring groups who had an established kinship tie to residents of Russian Mission or its satellite settlements. Elders described few sustained relations with upriver Athabaskan Indians; usually they were the few commonly noted kinship ties between Paimiut families and several families in Holy Cross.

Russian Mission respondents thought their neighbors' use areas were as equally accessible to them as they viewed their resource harvesting areas to be to their neighbors. However, many said they did not commonly venture outside their own areas without "sponsorship" of existing kinship ties, except once commercial salmon fishing was established, and when moose began their noticeable migration downriver to the Innoko River area (discussed in chap. 4, Moose Hunting). Russian Mission adults recalled stories told to them as children of Miluquyulit, meaning "those who like to throw things (implying malicious intent)." Some said Miluquyulit appeared at night to people who camped in areas unfamiliar to themselves, that is, places outside their own harvesting areas. Many viewed the threat of Miluquyulit as sufficient discouragement to wander too far, although that may have changed somewhat today.

1970

After 1940, the population of Russian Mission showed an increase which continued in the 1980s. Between 1950 and 1960, another population shift occurred prompted by the requirement to send children to school imposed by the territorial government (Nick 1984). Around 1955, Iquarniut, which had suffered a minor epidemic and caused multiple deaths, was virtually abandoned as a permanent settlement, although it was still used as a fish camp in 1984. Its residents moved to Russian Mission, Marshall, or the communities along the Kuskokwim River. Some of those who had gone to Marshall subsequently moved to Russian Mission as late as the mid-1960s. As mentioned above, former residents of Iquarniut and their descendents have expressed interest in returning and re-

2Jacobson (1984:237) defines miluquyulit as "legendary rock-throwing creature the size of a small human; by extension, moukey, ape."
establishing the community (Nick 1984); they reported that funding to buy materials for a community hall was obtained. Paimiut residents experienced the same dispersal, with more of them initially moving to Kalskag along the Kuskokwim River, and then some of those people again relocating to Russian Mission in the 1960s.

CONTEMPORARY COMMUNITY PROFILE

The community of Russian Mission consisted of an old and new section in 1984. The older section was on the river flood plain on the south side of the bluff. Some of the houses there were constructed of local timber with the remainder of wood-frame and plywood construction. Seven of the dwellings were built between 1973 and 1975 under a Bureau of Indian Affairs (BIA) housing project. A small Catholic Church was located in that section of the community. Several families attend Catholic Church services, although most residents (96 percent) were affiliated with the Russian Orthodox Church.

The south end of the older section was next to Nunvotchuk Lake (Nunvacuaq, meaning "small lake") which was a lagoon with many drainage branches. The branch nearest the village functioned as a boat harbor for residents whose dwellings were nearby and for most of the community during high or rough waters caused by storms.

Between the older section of the community and the new buildings, the lower lateral slope of the bluff was separated into knolls with small ravines between them. Food storage holes, called qengenret (plural; qengneq, singular) have been dug into the sides of the ravines with entrance holes buttressed with logs and doors either hinged to a side log or laid over and held in place with wooden latches. Qengenret were usually four feet high and about six feet deep with a shelf about two feet off the floor along the back wall dug further back into the sod. Subsistence foods, primarily dried salmon, were stored in the qengenret in fall when the temperature cools. Several qengenret have caved in due to age, as the permafrost has melted near the entrances.
The elementary and secondary schools and their support buildings were situated on top of the knoll closest to the river. On the middle knoll was the Russian Orthodox Church and cemetery. The third rise sloped into several broad terraces. On the lower terraces were located the city office and telephone utility buildings. Further up was the new housing subdivision, with 27 dwellings constructed in 1979 through a project sponsored by Association of Village Council Presidents Housing Authority (AVCP Housing), with headquarters in Bethel.

There were steambath houses (*maqiviit*), caches, some of which were raised, and other storage structures associated with dwellings throughout the community. In 1984, seven garden plots were planted with potatoes, carrots, turnips, lettuce, beets, peas, and broccoli in that order of frequency in 1984 near owners' residences or their fish camp sites. Most garden plots were approximately 200 square feet in size.

Russian Mission was incorporated as a second class city in 1970 and also had a federally-recognized traditional council, each of which was governed by its own seven-member council. The city council hired village police officers. The municipality also maintained the 1,500-foot airstrip, approximately 3 miles of gravel or dirt road, and the heavy equipment garage. The garage was constructed in 1979 in conjunction with the new housing subdivision, to hold heavy equipment and supplies to expand the water, solid waste, and sewerage system and lagoon. The municipal council sponsored funding and building in 1984 of a multipurpose community structure, expansion of water and sewerage lines, and fire station. The latter was designed to be operated by volunteers.

Headstart, a federally-funded pre-school program, was administered for the community by the Association of Village Council Presidents (AVCP), the regional non-profit organization which has offices in Bethel. The city had a cooperative agreement with the Lower Yukon School District, with regional offices in Mountain Village, whereby the school district provided fuel and electricity for the pumphouse that generated water for the whole community in return for water and sewer services. The municipality charged a standard fee per household for the piped-in water and sewer system which was installed in phases between 1970-73 through Indian Health Service grants. It was expanded in 1979 to
accommodate the new housing units and school facilities. Most households continued to use steambaths rather than the showers or bath tubs that were recently installed.

Russian Mission was incorporated as a profit-seeking village corporation under provisions of the Alaska Native Claims Settlement Act (ANCSA) of 1971. The corporation owned a generator which provided electricity to the community. It was partially subsidized for this service by payment of a standard monthly fee of $30 per household. The corporation also owned and managed snowmachine and outboard motor retail business, and a general merchandise store. Another ANCSA village corporation, Ohogamiut Inc., representing former residents and their descendents of the former year-round settlement of Iquarmiut, was based in Russian Mission. It operated a small general merchandise retail business in Russian Mission. There was one other family owned general store in 1984.

Russian Mission received medical services through the Bethel-based Yukon-Kuskokwim Health Corporation (YKHC), which also managed the regional U.S. Public Health Service (PHS) hospital, also in Bethel. There was one primary and at least two alternate health aides who worked at the clinic. They were supported by state-sponsored Public Health nurses who made field visits several times per year and through daily contact with medical doctors at the Bethel hospital by radio and telephone. PHS doctors from Bethel also had established a travel circuit to all communities in the Yukon-Kuskokwim delta. Individuals with life-threatening emergencies were air-lifted, weather permitting, to Bethel, and on to Anchorage, if necessary.

Several air taxi businesses from Bethel and St. Mary's provided almost daily service, contingent on the weather and the condition of the airstrip. Barge service was provided by a business based in Nenana, approximately 650 miles upriver at the confluence of the Nenana and Tanana rivers.

Telephone service to every home was available, but the cost was prohibitive for many. Citizens band radios were more widespread in the village and were also in fish camps during the summer months. Multichanneled television was provided by a state-funded satellite system and was found in virtually every home. The community received radio signals from KNOM in Nome and KYUK in Bethel.
Population Profile

In 1984, Russian Mission had a permanent resident population of 236 persons in 49 households. Households ranged in size from 1 to 11 with an average household size of 4.8 persons (Table 2). Most households (11) had 4 people, although households with 2 and 5 persons were also common (Fig. 3). Most residents (95 percent) were Alaska Native, the majority Yup'ik Eskimo. Eighty percent of the households were composed of nuclear families (parent[s] and children). The remainder were either extended family (three generations present) or single person (all males) households.

The average age of the population in 1984 was 21.9 years. The average age of males, who comprised 52 percent of the population, was slightly higher than that of females -- 23.9 compared to 20.6, respectively (Table 2) (Fig. 4). The overall average age of the Russian Mission population was lower than the average age of the population of Alaska, (26 years) which was reported to be younger than the national average of 30 (Alaska Department of Labor 1984; U.S Department of Commerce 1983). The youthfulness of the Russian Mission population was underscored by several points. Over one-half (54 percent) of the total population was under 15 years of age (Fig 4). Additionally, the dependency ratio was 1.11 dependents per each productive member (those aged 17 to 64 years). Of the dependents, 94 percent were 16 years of age or less, and 6 percent greater than 65 years of age (Table 2).

Employment

In 1984, there were 78 wage-earning positions held by 65 individuals in Russian Mission (Table 3). Most individuals who held more than one position combined part-time wage employment with a seasonal or full-time job. For example, those who worked 10 months of the year as teacher's aides or school building maintenance personnel often worked in summer on construction jobs. Of the 78 positions, 23 were seasonal jobs associated with summer construction, and another 21 positions
TABLE 2. DEMOGRAPHIC INFORMATION, RUSSIAN MISSION, 1984

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>236</td>
</tr>
<tr>
<td>Total households</td>
<td>49</td>
</tr>
<tr>
<td>Average household size</td>
<td>4.8</td>
</tr>
<tr>
<td>Range of household size</td>
<td>1-11</td>
</tr>
<tr>
<td>Sex ratio (number males per females)</td>
<td>1.09</td>
</tr>
<tr>
<td>Mean age (males and females combined)</td>
<td>21.9</td>
</tr>
<tr>
<td>Males</td>
<td>23.9</td>
</tr>
<tr>
<td>Females</td>
<td>20.6</td>
</tr>
<tr>
<td>Dependency ratioa (number dependents per producer)</td>
<td>1.11</td>
</tr>
</tbody>
</table>

*aDependency ratio calculated with 16 years and younger and 65 years and older as "dependents," and 17 through 64 years as "producers."

extended throughout the school year, which was from late August through May (Table 3). Consequently, only six positions were full-time year-round jobs. Two were paid by the city (administrator and village police), one was paid by the health corporation, two were with private or village corporations, and the other was with the U.S. Postal Service.

Of the seasonal positions not associated with the educational system, 23 were paid by the city from construction funds. The city paid all its employees $10 per hour in 1984, except for two construction supervisors who were paid $12 per hour (Table 3). The remainder of the non-educational seasonal positions were related to the commercial salmon fishery -- three people worked in salmon processing facilities outside the community and two operated fish tenders in the lower Yukon River.

There were 22 part-time positions which offered less than 20 cumulative hours per week of work or performed work as needed. Most part-time jobs were as alternates for other positions, such as the health aide; village police; store clerks; teacher or teacher aide substitutes; and the postal worker (Table 3). Other part-time positions included air taxi agents; a tutor for high school students; baby
Figure 3.
Figure 4. Russian Mission population profile by age and sex, 1984.
### TABLE 3. WAGE EMPLOYMENT OPPORTUNITIES, RUSSIAN MISSION, 1984-85

<table>
<thead>
<tr>
<th>Job type</th>
<th>Number of positions</th>
<th>Rate(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full-time, year-round (30+ hours per week)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postmaster</td>
<td>1</td>
<td>($9,802-11,643 + 25% COLA)</td>
</tr>
<tr>
<td>Village police officer</td>
<td>1</td>
<td>$10.00</td>
</tr>
<tr>
<td>City administrator</td>
<td>1</td>
<td>$10.00</td>
</tr>
<tr>
<td>Health aide</td>
<td>1</td>
<td>$8.65</td>
</tr>
<tr>
<td>Store manager</td>
<td>1</td>
<td>$12.56-16.57</td>
</tr>
<tr>
<td>Private business</td>
<td>1</td>
<td>$8.39-13.23</td>
</tr>
<tr>
<td><strong>10 months per year (30+ hours per week)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher's aide/bilingual specialist, LYSD(^c)</td>
<td>7</td>
<td>$10.05-14.05</td>
</tr>
<tr>
<td>Teacher, pre-school</td>
<td>2</td>
<td>$9.60</td>
</tr>
<tr>
<td>Secretary</td>
<td>1</td>
<td>$11.63</td>
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<td>Maintenance personnel, LYSD</td>
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<td>$12.56-16.57</td>
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<tr>
<td>Custodian, LYSD</td>
<td>2</td>
<td>$10.05-13.23</td>
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<tr>
<td>Cook, LYSD</td>
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<td>$11.74-16.57</td>
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<tr>
<td>Cook's helper, LYSD</td>
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<td>$8.39-13.23</td>
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<tr>
<td>Teacher (certified)</td>
<td>3</td>
<td>($28,623-52,380/year, DOE)</td>
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<tr>
<td>Pre-school director</td>
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<td>$10.27</td>
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<tr>
<td>Cook, pre-school</td>
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<td>$8.22</td>
</tr>
<tr>
<td><strong>Seasonal (40+ hours per week, three weeks to four months)</strong></td>
<td>23</td>
<td>$10.00-12.00</td>
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<tr>
<td>Construction</td>
<td>3</td>
<td>$6.50-9.25</td>
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<tr>
<td>Fish tender operator</td>
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<td>($0.07 per pound)</td>
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<tr>
<td><strong>Part-time (less than 20 hours per week)</strong></td>
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</tr>
<tr>
<td>Telephone utilities</td>
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<td>$6.00</td>
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<tr>
<td>Power plant operator</td>
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<td>$10.00</td>
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<tr>
<td>Teacher or aide substitute</td>
<td>2</td>
<td>$10.05</td>
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<tr>
<td>U.S. Fish &amp; Wildlife Service technician</td>
<td>1</td>
<td>$10.75</td>
</tr>
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<td>3</td>
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</tr>
<tr>
<td>Village police alternate</td>
<td>1</td>
<td>$10.00</td>
</tr>
<tr>
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</tr>
<tr>
<td>Janitor, preschool</td>
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<td>$8.22</td>
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<tr>
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<td>2</td>
<td>$10.50</td>
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<tr>
<td>Airline agent</td>
<td>4</td>
<td>($200-500 per month)</td>
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<tr>
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<td>($8.00 per form)</td>
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<tr>
<td>Post master alternate</td>
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<td>$22.00</td>
</tr>
<tr>
<td>Baby sitting, LYSD</td>
<td>1</td>
<td>$3.00-6.50</td>
</tr>
</tbody>
</table>

\(^a\)Rates are by hour unless otherwise noted.

\(^b\)Information not provided by private business.

\(^c\)Lower Yukon School District.
sitters for teachers; telephone utilities and power plant maintenance persons; janitor for the pre-school; a U.S. Fish and Wildlife Service technician; the airstrip and road maintenance crew; and two ANCSA village corporation employees.

In addition to the above-mentioned positions, all 17 of the commercial salmon permit holders who lived in Russian Mission sold salmon in 1984 and they hired an additional 6 residents as crew members or "helpers." Few Russian Mission commercial fishermen hired relatives in other communities as helpers also. Commercial fishing was the only form of income for two households in 1984; the majority combined commercial fishing and other types of employment. The 17 salmon permit holders earned a total of $140,070 for selling 228,761 pounds of salmon in 1984 (Commercial Fisheries Entry Commission 1984).

Eight households reported no wage employment or commercial fishing income in 1984. Of these, seven received transfer payments from one or several programs such as the Longevity Bonus Program, Old Age Assistance, Supplemental Security Income, Aid to Families with Dependent Children, or Food Stamps. Other households with employed members may have also received payments from one or more of these programs, however, this information was not collected during this study.

In 1984, unlike in other years, Russian Mission offered more opportunities for seasonal employment. The community secured funding for three projects and hoped to obtain funding for three more projects for the following summer. These construction projects provided employment for a large proportion of the labor force as individuals purposely rotated jobs to allow more people to work. However, this level of seasonal employment in Russian Mission was reportedly unusual.

Full-time employment in 1984 was less than in 1978, when eight year-round jobs including five youth positions were reported (Darbyshire and Associates 1979). Six other full-time, but not year-round, positions were associated with privately-owned businesses or village corporations, the post office, and the health clinic. Summer construction or fire-fighting were listed as possibilities for seasonal employment in 1978 (Darbyshire and Associates 1979).
Regardless of fluctuations in employment opportunities, the cost of living in Russian Mission was high, as in many other western Alaskan communities. For example, in 1984, frozen meat and poultry averaged $4.75 per pound, if it was available for purchase in either of the two stores. Propane cost $110 for a 100-gallon tank compared to $90 in Bethel and $36.77 in Anchorage. Prices of gasoline ranged between $2.20 to $2.35 per gallon in Russian Mission compared to approximately $1.42 per gallon in Bethel.

Russian Mission has been reported as having one of the lowest median household incomes in the state according to 1980 census data. In 1979, it was $1,935 per household with approximately 64 percent of the households earning less than $2,500 and none earning more than $24,599 (U.S. Department of Commerce 1983). Income levels appeared to have increased as demonstrated by taxable income between 1978 and 1982 -- they were $4,696 and $13,217, respectively (Alaska Department of Revenue 1984). It is probable that the increased income was in part, a result of summer construction jobs that have been more consistently available relative to previous years. The AVCP housing project in 1979 subsequently created more jobs with necessary expansions of the water and sewerage systems for several construction seasons. With decreases in state spending, it is likely that future seasonal construction jobs will become less available.
Five species of salmon -- king or chinook (Oncorhynchus shawyttscha;), chum (O. keta;), coho (O. kisutch;), sockeye (O. nerka;), and pink (O. gorbuscha;) -- were harvested by Russian Mission residents for subsistence use in 1984. Each species has its unique time of arrival and peak of abundance, however, there is some overlap in run timing. The salmon fishing season begins in late May and extends for approximately four months.

King or chinook salmon, the primary species harvested for human consumption, arrive first, usually in late May to early June, followed closely in run timing and importance by the first run of chum salmon referred to as the "summer" run. King salmon run abundance is generally still relatively large when the fish reach the Russian Mission area, particularly prior to the onset of commercial fishing downriver. All species spawn upriver from Russian Mission, although some king and chum salmon spawn in the Anuk and Andreafsky rivers, approximately 150 and 100 miles below Russian Mission, respectively. Salmon numbers are generally abundant in the area prior to the commercial fishing openings. Sockeye and pink salmon enter the Yukon River, usually beginning mid- to late-June, although they are not as significant for local use as coho salmon and the fall run of chum salmon, which arrive after sockeye and pink salmon. Fall chum salmon and coho salmon are caught until late September.

The Yup'ik terms for king salmon are taryaqvaq or kiagtaq, the latter meaning "summer thing." The summer run of chum salmon have two referents in both English and Yup'ik. They are called "chum" or "dog salmon" and either iqalluk or tegmaartluk. Pink salmon, called "humpie," are amaqaayak in Yup'ik, a term related to packing something on one's back, in reference to the hump on backs of males when sexually mature.
Local usage of both English and Yup'ik terms for sockeye salmon, fall chum salmon, and coho salmon caused some confusion during this study, as it has for other researchers in the past (Alaska Department of Fish and Game 1972; U.S. Department of the Interior 1962). Yup'ik terms have been less variable and, therefore, were the basis for identifying species harvested in 1984. Although most Russian Mission residents agreed that sockeye had its own proper Yup'ik term, which is sayak, actual distinction from summer chum was vague. Very few sockeye are available, so they are rarely caught. Elderly people and those who have been involved in the Bristol Bay commercial fishery noted that they can tell "reds" (sockeye) from chum salmon by their smaller size, straight, transparent tail, and bigger eyes.

Some residents interchanged "silver," "dog salmon," and "red" for both fall chum and coho depending on quality or brightness, use for dog food, or sexual maturity (U.S. Department of the Interior 1962). Commercial fishermen primarily applied the terms fall chum and coho to their respective species; some residents also called fall chum "red chum." In Yup'ik, qakiiyaq was used for coho and uquriq, meaning "one with oil or fat," for fall chum by most respondents. This was in contrast to lower Yukon River communities further downriver and coastal villages where uquriq was the term more commonly used for coho salmon and qakiiyaq for fall chum, a convention followed by those Russian Mission residents who had moved from downriver. The spots on coho were alluded to in order to clarify identification. Lastly, fall chum were also designated as nar'aaniq by some elders, several of whom thought it was a term borrowed from Athabaskan Indians upriver.

As mentioned, king salmon, the main species for human consumption by Russian Mission residents, were generally differentiated from other major salmon species that they harvested -- namely summer and fall chum salmon, and coho -- by referring to these other species, collectively, as "small salmon." This report follows this local convention when discussing the harvest and use of these species collectively.
Russian Mission residents harvested salmon for both commercial and subsistence uses. Subsistence salmon fishing was for local family use, dog food, and in some cases, for trade or barter along local networks. Salmon intended for subsistence use was processed by traditional means with family members providing labor. Respondents noted that several conditions conducive to effective subsistence salmon fishing existed on the stretch of the Yukon River from about Ohogamiut (Iquarmiut) to Dogfish Village (Iqallivigniut) and has sustained local populations for generations. These conditions included salmon run abundance upon arrival to the area; ice breakup occurring such that there was adequate time to prepare fish camps prior to arrival of king salmon runs; many productive fishing areas; a relatively small human population; and commercial regulations which were not as constricting for subsistence fishing as they have been along the lower Yukon River. A rich, reliable resource base, of which salmon is a central component has and continued to support people in the area.

The commercial salmon fishery in the lower Yukon has been in existence since 1918 with varying degrees of intensity and a six-year closure -- 1925-31 (Alaska Department of Fish and Game 1981). A perceived decline in fishing effort, due to a decrease in the number of dog teams as airplanes began replacing them for mail transport, resulted in resumption of commercial fishing in 1932 (Bower 1932). Commercial fishing in portions of or all Alaska waters of the main stem of the Yukon River has continued since then.

In 1974, the Yukon River was divided into six districts for management purposes and these districts were broadly lumped into "lower" and "upper" Yukon areas, each having three districts (Alaska Department of Fish and Game 1975). The lower Yukon River fishing districts are depicted in Figure 5. In 1984, Russian Mission was within District 3.

Salmon caught in the commercial fishery were sold by round weight to licensed buyers, primarily for export outside the region. Lower Yukon River commercial salmon fishermen have been required since 1976 to possess a limited entry permit issued by the Commercial Fisheries Entry
Commission (CFEC) (Dinneford and Hart 1987). Limiting the number of commercial fishermen and entrants into the fishery was deemed necessary to stabilize the rapidly expanding fishery in the early 1970s. In order to qualify for a permit, state law required individuals to demonstrate a prior consistent reliance on income from the fishery and a lack of alternative means of remuneration. Since the initial issuance of permits, an individual could only obtain a permit by inheritance, transfer, or purchase (Kamali 1984). There were 703 permits in the lower Yukon area in 1984 (Alaska Department of Fish and Game 1984). The average cost of a lower Yukon River limited entry commercial salmon permit has ranged from $9,289 in 1980 to $22,917 in 1985 (Dinneford and Hart 1987).

There were 17 limited entry salmon permit holders in Russian Mission in 1984, representing 31 percent of all households. All of the permit holders fished for and sold salmon in 1984. Additionally, every permit holder was involved in the subsistence fishery, usually as a harvester. As in the subsistence fishery, most commercial fishing crews were composed of related individuals. Seventy percent of the permit holders were heads of households (all but one was male). The remainder included the resident sons (18 percent), wives (6 percent), and fathers (6 percent) of household heads. The 17 permits were distributed among 15 households. Russian Mission had .35 commercial fishing permits per household compared to an overall average of .79 permits per household in the lower Yukon River communities downriver from Russian Mission (Wolfe 1982a).

In 1984, the management and regulation of the Yukon River salmon fishery dictated that commercial and subsistence salmon fishing be allowed only in concurrent open periods during commercial fishing seasons. There were two commercial seasons per summer in the lower Yukon River area. The early season began June 5 and lasted until July 25 and was managed for the commercial harvest of king and summer chum salmon. The late season began July 26 and extended until August 31. It was directed at fall chum, and more recently, coho salmon (Alaska Board of Fisheries 1984).

All Russian Mission respondents who were involved in the subsistence salmon fishery in 1984 reported that they attempted to harvest the majority of king and summer chum salmon for subsistence use prior to the initial opening of the commercial season. This has been the case since the mid-1970s.
For example, it was noted that over the past decade, most subsistence salmon fishing for all species of salmon was timed around each commercial season rather than during the concurrent commercial and subsistence fishing periods. There were a variety of reasons for the development of this strategy.

Several factors motivated Russian Mission residents to activate their fish camps and to catch king and summer chum salmon as soon as environmental conditions permitted. Some of these factors involved the evolution of the lower Yukon River commercial fishery. Other factors had to do with the arrival and time of harvest for sheefish and king salmon, local preferences for salmon products, as well as attempts to take advantage of optimal drying times and conditions in the summer.

During preparation of fish camps for the salmon fishing season, sheefish were taken immediately after river ice breakup as the fish made their migration upriver in spring. King or chum salmon nets were set for sheefish in essentially the same eddies where king salmon fishing was productive. Fishing for sheefish at that time using set nets provided a means for monitoring the timing and characteristics of the king salmon run, such as abundance, as king salmon become caught in the nets as well. Fishing families (single-household extended families or groups of related households working together) noted that when a relatively large number of king salmon were caught in nets set for sheefish, residents predicted that the king salmon run would peak in abundance earlier in the season and they prepared accordingly.

The harvest "window" between river ice breakup in the Russian Mission area and the first commercial fishing opening usually afforded families enough time to set up their fish camps and to harvest most of the king and summer chum salmon they needed for subsistence. Generally, in the 1980s, there had been between 18 to 26 days to fish for salmon after river ice breakup and prior to the first commercial fishing period in District 3. Ice breakup and ice-free navigation in the Russian Mission area generally occurs as much as one week earlier than the delta proper. In addition, fishermen in District 3 received as much as four days notice about the initial commercial opening in District 3. Those who had not caught many salmon for subsistence purposes in set nets used this lead time to shift to or add drifting as a method for getting their salmon prior to the initial commercial opening (Wolfe 1982a).
Fishing for king and summer chum salmon for subsistence early in the season provided the advantage of the best weather conditions for drying salmon, especially king and summer chum salmon. It also allowed adequate drying time for cut salmon. Later on, after the commercial fishery began, fishing families were inconvenienced by the regulation which required them to remove set nets 24 hours before and 24 hours after the commercial season opening. During the commercial seasons, fishing was allowed only during semiweekly 36-hour openings. Not only was fishing conducted at inopportune times, but spoilage of processed salmon became more of a risk because of rainy, windless weather later on in the summer.

GEAR

Historical sources report that traditional means of fishing for salmon in the Russian Mission area included dip nets, traps with fences, and drift and set nets made of willow or spruce root, sinew, baleen, or seal skin (Black 1984 [1860]; Dall 1870; Nelson 1979 [1899]; Wolfe 1979; Zagoskin 1967 [1847]). Seining with nets in relatively shallow spawning streams was another method for catching salmon. Efficacy, employment of gear, and method varied by species, season, water level, dispersion or density of salmon runs, and river current (Wolfe 1979). King salmon were taken primarily with dip nets, and set or drift gill nets. Traps were ineffective for catching king salmon because immediately after ice breakup when king salmon began to migrate upstream, ice and debris floating downriver was most dense and ruined traps and fences. Also, king salmon tend to occur midstream during their upriver migration in the lower Yukon River, and therefore, the use of traps and fish wheels fixed to river banks was nonproductive. In contrast, summer chum salmon and other smaller salmon could be taken with traps and fences because they tend to migrate closer to the river bank and occur when the river is generally free of ice and debris (Wolfe 1979). However, high water levels required use of other methods, such as dip nets and set or drift nets.

Introduction of new materials, such as linen, locally called “barber twine,” for manufacturing nets occurred in the late 1890s and the early part of this century (Wolfe 1979). Linen nets were readily
adopted even though they rarely lasted more than one season. They came to be preferred, according to local accounts, because of their lighter weight compared to nets made of traditional materials. By 1920, set nets made with non-traditional materials were the predominant gear used below Holy Cross while fish wheels were almost solely employed to catch chum and coho salmon by Athabaskan Indians (Wolfe 1979). Elderly residents in Russian Mission remembered the use of fish wheels to catch small salmon by some residents of Marshall, Ohogamiut, and Russian Mission until the early 1960s. Fish wheel sites in the area were described as few and highly variable in yield.

By the early 1960s, nylon or a combination of cotton and nylon filament began to replace linen in net webbing (Wolfe 1979). This change in material reduced required maintenance of nets and extended net life, consequently, they were considered more economical in terms of money spent and time to manufacture them. Additionally, net length and depth increased, making them more versatile. These nets could effectively be fished in deeper water, and areas where the current was relatively strong. The increased depth of these nets somewhat mitigated the problem of poor catches due to high water throughout the fishing season. This shift in gear coincided with growth of the commercial fishery (Alaska Department of Fish and Game 1981) on the lower Yukon River which promoted longer set and drift gill nets as the gear for effective participation in the commercial fishery.

In 1984, Russian Mission residents fished for all salmon species with set and drift gill nets. Some gill nets used for subsistence were remnants of commercial fishing nets; others were handmade, or "hung" by hand from purchased webbing. Standard commercial fishing net lengths were 50 and 100 fathoms (300 and 600 feet, with 50 and 150 fathoms being the legal limits for drift and set nets, respectively). Sixty-foot nets were commonly purchased and used almost exclusively for subsistence fishing. Nets that were set were used solely for subsistence fishing whereas gill nets were drifted for both subsistence and commercial fishing in 1984.

All households owned at least one wooden or aluminum skiff with an outboard engine which was used for fishing in 1984. Most boats were homemade wooden skiffs, between 18 to 23 feet in length. Most households with commercial permit holders owned more than one boat.
All 19 multi-household families that fished for king salmon in 1984 used between 8- and 8-3/4-inch stretched mesh gill nets. Sixty-four percent used drift gill nets only, most (64 percent) of which were 300 feet in length (Table 4). Secondarily, 14 percent used 120-foot nets for drift fishing. The remainder (22 percent) used 270, 80, or 60-foot drift gill nets to fish for king salmon for subsistence.

Drift gill nets were preferred for king salmon fishing because they can be protected from the ubiquitous driftwood, ice, and other debris in the Yukon river following ice breakup as one is fishing. In addition, it was noted that by drifting that early in the salmon season an area becomes "groomed" in that snags and other debris are cleared. Furthermore, drifting early in the season helps to discern possible changes affecting fishing productivity due to erosion or deposition or modifications in river currents and channels.

Thirty-one percent of the families who fished for king salmon used only set gill nets. In contrast to the longer drift gill nets, set gill nets used to fish for king salmon were all 90 feet or less in length. Two families used 90-foot set gill nets, whereas the others used 80, 75, 70, and 60-foot nets. One family (5 percent of families that fished for king salmon) simultaneously drifted for and set a net for king salmon in 1984. They reportedly did this to optimize their catch in order to complete

<table>
<thead>
<tr>
<th>Fishing method</th>
<th>Number of families using nets</th>
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<tbody>
<tr>
<td></td>
<td>King salmon nets</td>
</tr>
<tr>
<td></td>
<td>(≥ 8-inch mesh)</td>
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<tr>
<td>Drift net only</td>
<td>12 (64%)</td>
</tr>
<tr>
<td>Set net only</td>
<td>6 (31%)</td>
</tr>
<tr>
<td>Both drift and set net</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (100%)</td>
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</table>
subsistence fishing before the commercial fishery began, as they were busy establishing a new fish camp in the early part of the fishing season.

The 21 multi-household families who fished for chum, coho, and pink salmon also used gill nets, all 6-inch mesh, except for one 5-1/2-inch. Three families used more than one net to get small salmon. Ten used only a drift gill net; nine used only a set net; and two combined both types of gear (Table 4). In addition, summer chum salmon were caught incidentally in 8-3/4-inch mesh nets used for catching king salmon. As in king salmon fishing, longer nets prevailed among those who used drifting as a method for catching small salmon in 1984. Seventy-five percent used nets 300 feet long. Others used nets that were 240, 150, 120, and 80 feet long; there was one example of each of these lengths in drift net gear. Most families (82 percent) that used set nets for small salmon fishing used nets between 48 and 120 feet long, although 180- and 240-foot nets were also used.

**SUMMER FISH CAMPS AND FISHING AREAS**

In 1984, preparations for subsistence salmon fishing began, as usual, in early May when the amount of snow melted permitted access to boats, nets on racks, and other equipment that had been stored outside. The equipment was inspected and prepared for use. For example, wooden boats were caulked and painted, nets were mended, and supports for fish racks were reinforced or replaced. Preparations for making fish camps operational began as soon as river ice broke up sufficiently to allow travel by boat to fish camps, in late May and early June.

Choice of fish camp sites required consideration of such factors as proximity to effective fishing areas and protection away from the strong current or direct contact with the main channel of the Yukon River. Most of the fish camps in the vicinity of Russian Mission used in 1984 have been used for as long as the oldest residents can remember, usually by the same kin group(s). There were several areas that were used to operate fish camps, but were discontinued. Most of these were abandoned since approximately the mid-1970s. These areas included old settlement sites, such as
Paimiut; camping areas that have eroded, such as Akirivik between Ohogamiut and Russian Mission; or areas that attracted competing uses, such as Kako Creek.

All fish camp areas were situated on the north bank of the Yukon River where the most productive fishing areas were located. The bluffs on the north side are cut by ravines that most often provide clear water, which is a secondary, but desirable feature for some families. Clear water was used for drinking, and families with dog teams preferred these locations because they could readily catch summer chum of poor quality used to feed dogs. Nets set in small eddies at the outlets of these streams usually produce salmon which are close to spawning grounds. These are called "calico" fish in reference to the reddish, patchy coloring of salmon approaching spawning areas. Earlier in this century, these ravines were also important for log slides when people cut timber for sale to steamboats.

In general, fish camps included tent frames or cabins, fish drying and net racks, smokehouses, and fish processing facilities, such as tables and cribs for holding fish before cutting. Several camps also had a steam bath (maqivik) which was shared with other families at or near the fish camp site. Some families had complete processing facilities in the village, whereas others did not.

In 1984, most fish camps were operational by the first week of June, which was about six days after river ice breakup in the area. The only camp that was not set up by then was over 100 miles downriver where the Yukon River was not navigable yet due to presence of ice. Fish camps were used as the base for both commercial and subsistence fishing. Some commercial fishermen whose fish camps were near the boundary between salmon fishing districts 2 and 3 went downriver to District 2 during the commercial fishing periods, where more salmon could be taken for sale.

There were 16 fish camps operated by as many Russian Mission fishing families or production units in 1984 (Fig. 6). Twelve were within five miles of the community. Of these, six fish camps were accessible by foot. They were a relatively short walk from the community and it was not necessary to use a boat to get to them. Four of the six were situated along the bank of the Yukon River in front of the airstrip, about 1/4 mile from the older section of the village. Two of the six fish camps within walking distance were at Kangiqcuk, which was the pre-1838 Native settlement site discussed previously. The remaining six fish camps within five miles of the community were all downriver on side
sloughs, lagoons, or near ravines that produce shallow coves. This group of camps included several of the oldest, as well as two of the most recently, established fish camps. The new camps resulted when some extended family members using the older fish camps established other camps adjacent to the older ones.

Four camp sites were located beyond five miles of the community, three downriver from Russian Mission, and one upriver. Two fish camps downriver were near or at Ohogamiut and were operated by former residents of Ohogamiut. The third fish camp was approximately 120 miles downriver and was the only camp on the south bank of the Yukon River. It was established by a large multi-household extended family, primarily as a base for commercial fishing with subsequent and gradual addition of facilities to conduct subsistence fishing activities. This family was a relatively recent arrival to Russian Mission from the old traditional settlement of Paimiut.

One fish camp was approximately 20 miles upriver from Russian Mission at the former settlement of Dogfish Village (Iqallivigniut). It was established as a fish camp in 1980 by former residents of Paimiut who used Paimiut as a fish camp site prior to that time. One reason for the move to Dogfish Village was the trip to and from Paimiut was too long, particularly to deliver salmon to commercial buyers.

There were six fishing families that fished for salmon using Russian Mission as a base of operations. Three of the families were fully equipped with processing facilities, drying racks, and smokehouses in the community. The remaining three families lacked processing facilities; they dried king and summer chum salmon with their parents who had the equipment and fished for coho and fall chum to freeze by themselves.

As with fish camp sites, most of the salmon fishing areas used for subsistence fishing by Russian Mission residents between 1980-84 were within District 3 (Figs. 5 and 7). Drift gill net fishing occurred in specific areas within a 150-mile stretch of the lower Yukon River from the north end of an island between Paimiut and Russian Mission downstream to the area where the north pass branches off the stem of the Yukon River (Fig. 7). Some of these areas, particularly in District 1 and 2, were used
primarily for commercial fishing; however, commercial fishermen noted that they invariably brought a few salmon home to eat.

Seventeen set gill net sites were used for salmon fishing between 1980-84. All of these sites were near fish camps situated close to Russian Mission or the former settlement of Ohogamiut. Most sites were along the north bank. Russian Mission residents who maintained fish camps away from Russian Mission and Ohogamiut noted that most of the productive set net fishing sites were used by people from nearby communities, so more distant Russian Mission families primarily used drift gill net fishing as a method to get their subsistence salmon.

PARTICIPATION AND HARVEST

Subsistence Salmon Production Units

Information on 1984 harvest levels, fish camp sites and operations; gear; methods; fishing areas; and the social organization of the production of salmon for family consumption were collected using a survey questionnaire and during interviews. All 22 salmon fishing families or production units were interviewed in 1984. Fifty-five percent of the salmon production units had more than one household. They averaged 2.1 households with a range of 1 to 5 households per production unit. All production units which included more than one household involved cooperation between parents and their adult children living in separate households.

The 22 subsistence salmon production units incorporated 39 households or 80 percent of all households and included 90 percent of the total population. Each production unit was headed by a married couple that "owned" and operated a fully-equipped fish camp or minimally had a drying rack and smokehouse, if the village was the base of fishing operations.

The 22 households that included subsistence salmon production unit managers included 100 percent of the extended family (three-generation) households in the community. The 22 salmon production unit managers and their households share characteristics that differentiate them from those
who did not manage subsistence salmon production units. The households in which they lived and also headed were larger in size than those which did not have production unit managers -- 6.1 compared to 3.8 persons per household, respectively (Fig. 8). The average age of the 22 household heads in charge of production units was 14 years older than the age of the household heads not in charge of production units -- 51 compared to 37 years of age (Fig. 9). The overall average age of all household heads was 44 years. Fifty-nine percent of production unit heads were 50 years or older.

Ten single-household production units were comprised of newly separated production units, some of whom still contributed labor to their former work groups; large, three-generation households; non-Natives without relatives in Russian Mission; or production units in the waning phase of their cycle. Of the 10 salmon production units which were composed of 1 household, 5 had members who contributed labor to other production units. These five were relatively new production units -- between 1 to 5 years old. The heads of these production units, whose average age was 35 years, helped their parents' production units of which they were recent former members, suggesting that new production units went through a differentiation-cooperation phase relative to their former production units.

Two of the single-household production units were composed of non-Natives. They were not related to any Russian Mission residents and did not join other families to fish and process salmon. Two other single-household production units were among the largest (8+ persons) in the community and were extended families. They included married adult offspring, who resided in the households. One single-household production unit had assistance in previous years from a younger sibling who had just started another multiple-household production unit; they each operated as separate units in 1984.

Fishermen and Processors

Subsistence salmon production units had between 1 to 4 fishermen with an average of 2.6 fishermen per production unit. There were a total of 50 fishermen in the 22 production units who ranged from 11 to 66 years of age. Seven of the 50 fishermen fished for more than one production unit. They fished for their own production units as well as their parent' or parents' siblings. Heads of
Figure 8. Household size of subsistence salmon production unit managers and non-managers in Russian Mission, 1984.
Figure 9.
production units made up 30 percent of the fishermen. Approximately one-half were sons (42 percent) or sons-in-law (9 percent) of the heads of production units. Nephews and daughters of heads of production units shared the next frequent category of kin who fished (2 percent each). The remainder of kin categories who fished for subsistence salmon included a father, wife, daughter-in-law, brother, and brother-in-law of the heads of production units.

Most (59 percent) subsistence salmon fishermen cooperating for one production unit also belonged to one household, which usually was an extended-family household. Conversely, there were as many as four different households contributing fishermen to one production unit. An average of 1.6 households were represented by fishermen in each production unit.

A total of 51 individuals, ranging from 13 to 60 years of age, processed salmon in one of the 22 subsistence salmon production units. There was a range of 1 to 4 processors or an average of 2.3 processors per production unit. Three women processed salmon in more than one production unit -- they worked on their own and helped their parents or parents-in-law.

The wives in couples that managed salmon production units processed salmon for their own production unit in 91 percent of the cases. They made up 39 percent of the 51 processors. Daughters of couples who managed production units were the next most frequently represented kin category among processors (25.5 percent). Husbands in couples that directed the operation of the production unit were the third most frequent (14 percent) kin category among processors. Daughters-in-law (10 percent), sons (8 percent), a sister and nephew (2 percent each) of the male heads of production units completed the kin categories involved as salmon processors. Most men involved in processing gutted the salmon, salted salmon parts, or made "flat fish" and "dog fish;" the latter two dried products were primarily used for dog food (see Charnley 1984 for descriptions of these salmon products).

Sixty-four percent of subsistence salmon production units had processors who belonged to one household; similar to the pattern with fishermen, these households most often included three generations (extended families). The remainder of production units involved processors from as many as four different households with 1.7 as the average number of households represented by processors in a production unit.
Household Participation

Analysis of subsistence salmon fishing households as opposed to production units revealed some interesting comparisons. As mentioned above, 80 percent of all Russian Mission households were involved in fishing or processing salmon for subsistence use in 1984. As in the case with the heads of households who managed production units, the average size of the 39 households that were involved in subsistence salmon production was over twice the average of those households that did not participate -- 5.4 compared to 2.4 persons per household, respectively (Fig. 10). However, in contrast to heads of households who managed production units the average age of the 39 heads of fishing households was 42 compared to 49 years of age for the household heads who were not involved (Fig. 11). The managers of production units were generally older couples with experience and equipment to organize the production of salmon for subsistence uses, as previous discussion noted. In many cases, they had adult children in separate households, which decreased the average age of household heads whose members were involved in any aspect of subsistence salmon production.

Forty percent of the households not involved in fishing or processing salmon in 1984 were made up single elderly men, most of whom were widowers. The remainder of the non-fishing households were composed of either young married couples either without children or with very small children or widow(ers) with unmarried sons in residence.

Distribution of Processed Salmon

All households who had a member who participated in a production unit had a recognized right to take salmon processed by that production unit, which was stored in facilities belonging to the couple who headed the production unit. The 10 households (20 percent of the total) that did not fish for or assist in processing salmon received salmon through sharing. Nearly all were identified as regular recipients of salmon products given to them by one or more of the 22 production units. So, nearly all (96 percent) Russian Mission households were part of a salmon consumption unit in 1984-85.
Figure 10. Household size of subsistence salmon fishing and non-fishing households in Russian Mission, 1984.
Figure 11. Age of household heads of subsistence salmon fishing and non-fishing households in Russian Mission, 1984.
The remainder could not be contacted. Overall, there was 1.0 salmon producer for every 3.6 consumers in 1984.

Most frequently, salmon processed and dried as "flats" or "blankets," and "strips" (king salmon) was given away, although frozen and salted salmon was also shared. The giving and receiving of fresh salmon in season was difficult to track because it was widespread and common, unless it involved considerable numbers.

The households that received salmon were given salmon by a primary relative (parent, sibling, children) in 75 percent of the cases. The other relatives were nephews or cousins of the recipients. In several cases, the giver was categorized as a friend. Several of the recipient households, all with elderly members, were given salmon products by as many as three production units. Only production units with non-Native managers gave salmon to non-kin, both within and outside of the community. None of the non-Native households that participated in subsistence salmon production received processed salmon from other production units as of January 1985.

Harvest Levels

The harvest of salmon for subsistence in the Yukon River drainage including Russian Mission has been estimated using a somewhat uniform method since 1961. Although harvests were estimated prior to that time, they were derived from extremely limited information and were subject to interpretation (Pennoyer, Middleton, and Morris et al. 1965). Since 1961, excluding 1984, subsistence salmon harvests were estimated using several methods for contacting primary fishing families (Alaska Department of Fish and Game 1961-83). In this study, every fishing family and household was contacted for recording salmon harvested for subsistence use, and therefore represents a census, rather then an estimate based on a sample.

Based on harvest estimates from 1961-84, subsistence king salmon harvests by Russian Mission residents ranged from 639 to 2,634, with an average of 1,412 king salmon harvested by the community over the 24-year period. Number of reported fishing families ranged from 14 to 26, with an average of
18 between 1963-84 (Table 5). Average family harvests of king salmon ranged from 44 to 131. For the same time period, total small salmon harvest estimates have ranged between 880 to 10,069 for an annual average of 3,769 small salmon, and average family harvests ranged from 46 to 504 small salmon (Tables 5 and 6) (Fig. 12). In some years, lower harvests of king salmon could be attributed, in part, to less families fishing.

The number of king salmon harvested has generally accounted for 31 percent of all salmon with a range of 6 to 65 percent from 1961-84. However, in terms of usable pounds produced in the 24-year period, king salmon have accounted for an annual average of 56 percent of the total, with a range of 15 to 86 percent of the total usable pounds of all salmon harvested for subsistence use (Fig. 13). Derivation of usable weights of salmon by species is shown in Appendix 3.

### Table 5. Number of Russian Mission Fishing Families and Average King and Small Salmon Harvests Per Fishing Family, 1963-84

| Year | Number of fishing families | Average number harvested | | Year | Number of fishing families | Average number harvested |
|------|----------------------------|--------------------------| | | | | |
| | | King salmon | Small salmon | | | King salmon | Small salmon |
| 1963 | 16 | 87 | 335 | 1975 | 16 | 131 | 257 |
| 1964 | 20 | 59 | 504 | 1976 | 15 | 89 | 161 |
| 1965 | 17 | 82 | 288 | 1977 | 14 | 46 | 162 |
| 1966 | 14 | 57 | 193 | 1978 | 18 | 83 | 70 |
| 1967 | 19 | 106 | 258 | 1979 | 18 | 82 | 107 |
| 1968 | 17 | 128 | 226 | 1980 | 19 | 87 | 46 |
| 1969 | 16 | 44 | 229 | 1981 | 21 | 80 | 170 |
| 1970 | 18 | 55 | 173 | 1982 | 21 | 78 | 105 |
| 1971 | 16 | 52 | 149 | 1983 | 26 | 101 | 111 |
| 1972 | 16 | 61 | 182 | 1984 | 22 | 88 | 174 |
| 1973 | 16 | 87 | 154 | 1985 | | | |
| 1974 | 17 | 73 | 279 | Averages | 18 | 80 | 193 |

Sources: 1963-83 data from Walker and Brown 1988; 1984 data from this study.
**TABLE 6. ESTIMATED SUBSISTENCE SALMON HARVESTS BY RUSSIAN MISSION RESIDENTS, 1961-84.**

<table>
<thead>
<tr>
<th>Year</th>
<th>King salmon</th>
<th>Summer chum salmon</th>
<th>Fall chum salmon</th>
<th>Coho salmon</th>
<th>Total small salmon</th>
<th>Pink salmon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>1,563</td>
<td></td>
<td></td>
<td></td>
<td>4,098</td>
<td></td>
</tr>
<tr>
<td>1962</td>
<td>641</td>
<td></td>
<td></td>
<td></td>
<td>9,994</td>
<td></td>
</tr>
<tr>
<td>1963</td>
<td>1,392</td>
<td></td>
<td></td>
<td></td>
<td>5,354</td>
<td></td>
</tr>
<tr>
<td>1964</td>
<td>1,851</td>
<td></td>
<td></td>
<td></td>
<td>10,069</td>
<td></td>
</tr>
<tr>
<td>1965</td>
<td>1,393</td>
<td></td>
<td></td>
<td></td>
<td>4,888</td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td>2,707</td>
<td></td>
</tr>
<tr>
<td>1967</td>
<td>2,019</td>
<td></td>
<td></td>
<td></td>
<td>4,897</td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>2,170</td>
<td></td>
<td></td>
<td></td>
<td>3,836</td>
<td></td>
</tr>
<tr>
<td>1969</td>
<td>707</td>
<td></td>
<td></td>
<td></td>
<td>3,668</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>993</td>
<td></td>
<td></td>
<td></td>
<td>3,114</td>
<td></td>
</tr>
<tr>
<td>1971</td>
<td>839</td>
<td></td>
<td></td>
<td></td>
<td>2,378</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>975</td>
<td></td>
<td></td>
<td></td>
<td>2,919</td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>1,387</td>
<td></td>
<td></td>
<td></td>
<td>2,459</td>
<td></td>
</tr>
<tr>
<td>1974</td>
<td>1,243</td>
<td></td>
<td></td>
<td></td>
<td>4,740</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>2,098</td>
<td></td>
<td></td>
<td></td>
<td>4,113</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>1,328</td>
<td></td>
<td></td>
<td></td>
<td>2,407</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>639</td>
<td>1,801</td>
<td>300</td>
<td>161</td>
<td>2,262</td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>1,498</td>
<td>856</td>
<td>177</td>
<td>223</td>
<td>1,256</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>1,476</td>
<td>913</td>
<td>1,002</td>
<td>12</td>
<td>1,927</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>1,660</td>
<td>628</td>
<td>226</td>
<td>26</td>
<td>880</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>1,689</td>
<td>2,628</td>
<td>497</td>
<td>434</td>
<td>3,559</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>1,628</td>
<td>1,419</td>
<td>630</td>
<td>156</td>
<td>2,205</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>2,634</td>
<td>1,576</td>
<td>773</td>
<td>540</td>
<td>2,889</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>1,938</td>
<td>2,227</td>
<td>860</td>
<td>740</td>
<td>3,827</td>
<td>502</td>
</tr>
</tbody>
</table>

**SOURCES:** 1961-83 data from Walker and Brown 1988; 1984 data from this study.

**NOTE:** Summer chum, fall chum, and coho salmon were not systematically differentiated in surveys until 1977.

*Pink salmon included prior to 1984.*

Number of king salmon harvested have been proportionately higher after 1964, which is the approximate time that snowmachines were adopted as the primary mode of winter transportation in place of dog teams. On the average, king salmon represented 16 percent of the total salmon harvested prior to 1965, whereas their average proportion of the total harvest increased to 33 percent after that time. By weight, king salmon accounted for an average of 36 percent of all salmon caught before 1965 and 60 percent since 1965 (Fig. 13).
Figure 12.
Estimated subsistence salmon harvests by residents of Russian Mission, 1968-84.

NUMBER SALMON HARVESTED
(Thousands)

- KING SALMON
- SMALL SALMON

YEAR
Figure 13. Percentage of edible pounds of king and small salmon harvested by residents of Russian Mission, 1961-84.
Although the total numbers of salmon harvested was important, the ratio of the harvest of kings to small salmon was of particular concern to local people, especially the catch of king and summer chum salmon. As mentioned, king and summer chum salmon were the most important species for human food. However, it was noted in this study that the number of summer chum salmon harvested by families that usually caught large numbers of king salmon, and did not have dog teams, was more a function of trying to assure that enough king salmon have been caught and to supplement the king salmon harvest. People expressed their intent of getting more king salmon in nets set for summer chum, once the majority of king salmon had passed through the area, although summer chum certainly were targeted. Recent developments in the commercial fishery and the decreasing reliance on dog teams may also have been factors that contributed to an emphasis on king salmon for subsistence. However, this does not suggest that other species were not important. More in depth examination of relationships between species and factors which guides or influences these choices is necessary.

In 1984, Russian Mission residents harvested an estimated total of 1,938 king salmon; 2,227 summer chum; 860 fall chum; 740 coho; and 502 pink salmon. This equalled to a total of 6,267 salmon and 54,809 usable pounds for all species combined (Table 7). Usable weight refers to the flesh, roe, and head of salmon, that is, the parts that were processed for human consumption (Appendix 3). Percentages of total numbers and weight contributions by species are presented in Figures 14 and 15. In 1984, the harvest of all species, excluding pink salmon, was 5,765 salmon. This was slightly higher compared the 23-year average of 5,155 salmon from 1961-83. Averages for the years 1977-83 for which there was data by species were all lower than 1984 harvests: 1,603 king salmon; 1,403 summer chum; 515 fall chum; and 222 coho.

Total harvest and average for each species by production unit in 1984 is presented in Table 7, which also shows per capita harvests by species. King salmon provided the greatest per capita yield. It exceeded the per capita harvest of all other species combined -- 134.47 pounds of king salmon compared to 97.6 pounds of small salmon and pink salmon combined. The overall per capita production of salmon for subsistence in 1984 was 232.2 pounds (Table 7). In terms of use as human food, king salmon gained in significance, a point discussed in the next section.
TABLE 7. NUMBER AND EDIBLE POUNDS OF SUBSISTENCE SALMON PER PRODUCTION UNIT AND PER CAPITA IN RUSSIAN MISSION, 1984

<table>
<thead>
<tr>
<th>Species</th>
<th>Production units that fished (N=22)</th>
<th>Total -- All production units</th>
<th>Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Pounds</td>
<td>Per production unit</td>
</tr>
<tr>
<td>King salmon</td>
<td>19</td>
<td>1,938</td>
<td>31,783.3</td>
</tr>
<tr>
<td>Summer chum salmon</td>
<td>18</td>
<td>2,272</td>
<td>12,115.0</td>
</tr>
<tr>
<td>Fall chum salmon</td>
<td>7</td>
<td>860</td>
<td>5,160.0</td>
</tr>
<tr>
<td>Coho salmon</td>
<td>18</td>
<td>740</td>
<td>4,144.0</td>
</tr>
<tr>
<td>Pink salmon</td>
<td>2</td>
<td>502</td>
<td>1,606.4</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>6,267</td>
<td>54,808.7</td>
</tr>
</tbody>
</table>

^aPer capita averages were based on the total population of Russian Mission (N=236).

Processing and Use

The primary method of preserving most salmon in Russian Mission was by drying and smoking. Other methods of processing salmon or salmon parts for future use included salting; canning; freezing; partially drying then freezing; or aging. Salmon were also eaten fresh. Most salmon cutting, drying, and smoking methods utilized by residents of Russian Mission were very similar to those described for Chuathbaluk and Sleetmute by Charnley (1984). There were a few variations on the treatment of king salmon.

Processing of king salmon was the most complex, due to their size and local specialization. In preparation for drying, king salmon were deheaded as close to the head as the gill cover would allow in order to leave as much of the pectoral fin area as possible attached to the body. The belly section and dorsal fin was cut away. This type of cut was used since the belly section was usually salted (made into...
Figure 14: Percentage contribution by species of numbers of subsistence salmon harvested, Russian Mission, 1984.
Figure 15. Percentage contribution by species of the usable pounds of subsistence salmon harvested, Russian Mission, 1984.
culunaq), while the dorsal fin was either salted, partially dried, then cooked (flesh prepared in this manner is called egamaarriuk), or dried and smoked in strings along with other dorsal fins.

A cut was made through the skin about two inches from the tail fin. Two flaps of flesh and skin attached on either side of the tail bone were pared away from the tail and scored vertically. The tail fin was broken off where the circular cut was made. Then, approximately 3/4-inch thickness of flesh and skin was filleted from both sides of the backbone, beginning around the gaping opening where the belly section had been. A thin, oily piece of flesh was trimmed off of the skin down the entire length of the middle of the huge flat piece. This piece of flesh was dried into jerky (the dried product is called kumgaruaq. The huge "flats" or "blankets" were scored horizontally and kept open throughout the drying and smoking process by threading a piece or two of willow across each of them.

The section of tail with the vertical scoring was tied together with other tails into garlands to be partially or totally dried and smoked. The head was split open by cutting from the chin and, like the tails, it was tied together with other heads and partially or fully dried and smoked. Partially dried tails and heads were boiled and eaten.

The backbone was trimmed of flesh until it had approximately 3/4-inch thickness of flesh attached to it. This flesh still on the backbone was scored horizontally. After being tied to another backbone near the tail, the two backbones were draped over racks to dry and smoke. The trimmings off the backbone were dried into jerky, and unlike the pieces off the skin side, were called ki.ameret (meaning unknown).

If a salmon was eaten fresh, the roe was usually cooked with the rest of the fish. Otherwise, the roe was partially dried, stored in wooden barrels to age slightly and then eaten in the winter, or used in mak'uaq, a type of akuaq. Served primarily as a dessert, akuaq means "a mixture," usually of berries and fat substances, such as vegetable shortening, reindeer tallow, burbot liver, aged roe, or cooked fish flesh; thinning agents, such as seal oil, vegetable oil, water and milk; and in most cases, sugar.

Although heads of all salmon species could be processed into topa, or "fermented (stink) heads," fall chum or coho salmon heads were most commonly used because cooler fall season
temperatures allowed safer preparation of this delicacy. There were less flies to lay eggs on the heads, and therefore, was a reduced chance of developing botulism germs or ending up with a rotten rather than a fermented product. Several families noted for their skill in producing tepa, used summer chum salmon heads in addition to fall chum and coho salmon heads. King salmon heads were split in half for this process to facilitate controlled fermentation, rather than rotting of the otherwise large pieces. Between 20 to 40 salmon heads were buried together in pits, roughly two to three feet square or in diameter and of the same depth. The pits were lined with grass and a layer of salmon milt and roe. More roe and milt was sometimes interspersed between layers of salmon heads. The pit was closed with a final layer of roe and milt, grass, and sod. The heads were allowed to ferment in this partially anaerobic setting for up to four weeks. The sauce formed by the fermented roe and milt was rinsed off before eating.

In 1984, most king salmon (63 percent) and summer chum (73 percent) harvested was dried and smoked (Table 8). The relatively few fall chum and coho processed to dry were actually partially

<p>| TABLE 8. PROCESSING METHODS AND USE OF SALMON HARVESTED BY RESIDENTS OF RUSSIAN MISSION, 1984 |
|---------------------------------|-----------------|----------------|----------|----------|----------|----------------|</p>
<table>
<thead>
<tr>
<th>Species</th>
<th>Number of salmon</th>
<th>Made into &quot;strips&quot;</th>
<th>Gallons salted&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Frozen</th>
<th>Eaten fresh</th>
<th>Given away</th>
<th>Dog food</th>
</tr>
</thead>
<tbody>
<tr>
<td>King salmon</td>
<td>1,229</td>
<td>577</td>
<td>327</td>
<td>61</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer chum salmon</td>
<td>1,626</td>
<td></td>
<td>41</td>
<td>142</td>
<td></td>
<td>168</td>
<td>250</td>
</tr>
<tr>
<td>Fall chum salmon</td>
<td>30</td>
<td></td>
<td>36</td>
<td>24</td>
<td></td>
<td>120</td>
<td>650</td>
</tr>
<tr>
<td>Coho salmon</td>
<td>200</td>
<td>60</td>
<td>40</td>
<td>249</td>
<td>41</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>Pink salmon</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Totals</td>
<td>3,085</td>
<td>637</td>
<td>367</td>
<td>387</td>
<td>269</td>
<td>358</td>
<td>1,500</td>
</tr>
</tbody>
</table>

<sup>a</sup>Most gallons salted represent king salmon and coho salmon bellies and heads, except for 11 king and 20 coho that had all parts salted.
dried, lightly smoked and frozen, and boiled. King salmon and coho were also salted or made into "strips," which were thin strips of flesh on skin, brined, dried, and smoked. Oily salmon, such as king salmon or coho was the most desirable for these types of processing.

All species, except pink salmon, were frozen for later use. Coho accounted for the greatest number (64 percent) of frozen salmon. Their smaller size allowed them to be frozen whole, which was considered the best freezing method to avoid freezer burn. Some of all salmon species were eaten fresh, with the majority (55 percent) of those being summer chum. Their availability extended for the longest period of time of any species.

The category of salmon "given away" represents salmon given away whole, usually in large batches, immediately after being caught in drift or set gill nets (Table 8). Commonly, those who caught more than they wanted, for example, to eat fresh, or more than they could process in a given amount of time with their available labor force, kept the few that they wanted or could process. They gave the rest to another production unit. The usual recipients were production units with elderly active members or those who had not been as fortunate in catching fish. Sometimes, fishermen set up agreements to give salmon away or asked the approximate number needed by the prospective recipients prior to fishing. Note that no king salmon were given away in 1984 (Table 8). However, residents said they had given away a few, if they were unable to work on them, although this occurred very infrequently.

Salmon fed to dogs represented mostly fresh salmon given directly and whole to dog teams throughout the season, although an estimated 40 percent of the summer and fall chum combined were processed to dry for winter dog food. One dog team owner buried coho salmon for winter dog food and most of the pink salmon was left out in the cool fall air and fed to dogs as needed. There were approximately 73 dogs in 7 teams in 1984, not including household pets that were usually fed scraps from household meals. All salmon producers noted that salmon processed for human food may end up as dog food if it spoiled while drying because of persistent rainy, damp weather, or hot, extremely dry, windless weather. Also, most salmon left over by the time the next season's catch was ready for eating was fed to dogs. Leftover salmon was rare or commonly negligible, according to all families.
Practically all parts of all salmon species were used in some fashion. Any parts that were not processed or used for human consumption, such as most small salmon heads, entrails, and gills were fed to dogs throughout the fishing season.

HISTORY OF FISHING REGULATIONS

Wolfe (1982a) examined commercial regulatory impacts on subsistence fishing and the fish camp system in lower Yukon River fishing districts 1 and 2 (Fig. 5), primarily in response to a proposal by the Lower Yukon Fish and Game advisory committee to change the concurrent subsistence and commercial fishing times to discrete and alternating periods. Because of the regulatory requirement for simultaneous commercial and subsistence fishing once the commercial seasons have started, regulations to limit or reduce commercial fishing efficiency and time have a direct and sometimes deleterious effect on the subsistence fishery (Wolfe 1982a). As Wolfe noted, a pattern was established in which more restrictions were instituted to control the salmon harvest rate and level in the ever more efficient commercial fishery, which, in turn, affected subsistence fishing opportunities. The proposal was not adopted as written, but some additional time for subsistence fishing was provided beginning in 1982.

Some of the concerns of Russian Mission residents paralleled Wolfe's (1982a) observations of the lower river districts. However, there were important differences that arose from the different regulatory history and environmental features of the District 3 area. This discussion concentrates on regulated subsistence fishing times during commercial seasons and certain district boundary changes rather than on other aspects, such as gear restrictions and gear changes over time, which were sometimes viewed locally as a causing some hardship, primarily for those involved in the commercial fishery.

The Russian Mission area was not directly involved in the commercial salmon fishery until the 1950s, although some residents regularly went downriver to participate in commercial fishing or worked in the canneries and salteries. Prior to that time, most commercial fishing was allowed only in
"outside" waters or "seaward from 500 yards off the mouth of each stream" (Pennoyer et al. 1965). Since 1934, commercial fishing inside the Yukon River "was limited to native Indians and bona fide permanent white residents" (Bower 1935). Between 1954 and 1960, the river-wide quota was set at 65,000 king salmon, of which up to 10,000 king salmon were allocated to the area between the Anuk and Anvik rivers, which corresponds roughly to the waters currently within lower Yukon River districts 2 and 3. Throughout this time, five and one-half days per week of fishing were allowed until the king salmon quota was met and then seven days per week of fishing resumed (Alaska Department of Fish and Game 1984).

Although small salmon were caught incidentally in king salmon gear, they were not targeted in the commercial fishery until 1961. For the first time that year, the commercial season reopened on August 1 after the closure of the king salmon season to allow commercial harvest of coho. Four days per week of fishing were permitted during the king salmon and coho season in districts 1 and 2. The area upriver from Owl Slough near Marshall was on a quota system rather than a weekly fishing schedule; when 5,000 king salmon and 5,000 coho were caught their respective commercial seasons were closed (Alaska Department of Fish and Game 1961).

In 1963, District 3 and 4 were initially delineated with District 3 defined as the waters "[f]rom Owl Slough [near Marshall] upstream to the mouth of the Koyukuk River" (Alaska Department of Fish and Game 1963). Refined differentiation of the area upstream from Owl Slough was probably established to accommodate newly set quotas in each new district and to request district registration during the king salmon season. Reregistration for another district could occur in the late season after a 48-hour waiting period when fishing in any district was prohibited.

Several regulatory changes in 1964 affected the Russian Mission area and the interaction between the commercial and subsistence fishery. In addition to the quota, District 3 was put on the same four days per week fishing schedule as the two lower river districts. More importantly, boats and gear registered to commercial fish in districts 3 or 4 were prohibited from transferring to the lower two districts in either the king salmon or the coho season. This contributed to the development of the pattern of attempting to conduct most king salmon and summer chum subsistence fishing prior to the
commercial season in Russian Mission, if residents wanted to participate in the commercial fishery in the lower districts. Respondents noted that since cannery or saltery jobs, most reliable buyers, and eventually better salmon prices, were available in the two lower districts, commercial fishermen from Russian Mission would frequently transfer to the lower districts after getting their subsistence king and summer chum salmon. This regulation resulted in some families establishing fish camps in the lower two districts. Also, respondents viewed this as discouraging involvement in the commercial fishery in District 3, such that many Russian Mission residents subsequently did not possess qualifications for the limited entry commercial permits issued in 1976.

One strategy to maximize benefits from both commercial and subsistence fishing in the face of difficult choices was to divide the family between members who went downriver to commercial fish and those who stayed to conduct subsistence fishing and some commercial fishing in District 3. Several families that included three generations and already possessed enough gear used this strategy, with younger couples going downriver to commercial fish and work in the cannery and their parents and younger siblings putting up salmon for subsistence. However, for most families maintaining two sets of gear was prohibitive in terms of cash, labor, and time required.

This regulation changed in 1974 to allow District 3 fishermen to transfer to the two lower districts after July 10. The regulation was still in effect in 1984 and was taken advantage of by Russian Mission fishermen. In the few years immediately following 1974, few Russian Mission fishermen were able to take advantage of the inter-district transfer regulation. Participation in the commercial fishery in 1974 and 1975 was a critical prerequisite for those who eventually qualified for limited entry permits. As some respondents noted, explanations or news of regulatory changes often did not reach affected people, partly due to the rudimentary communication infrastructure which existed then.

In contrast to progressively reduced fishing times during the commercial season in the two lower river districts (Wolfe 1982a), fishing times remained stable at four consecutive days per week in District 3. A difference between the lower districts and District 3 was eliminated in 1974. For the first time, all Yukon districts were included in the 24-hour closures of all fishing prior to and following commercial seasons which previously applied only to districts 1 and 2 (Alaska Department of Fish and
Game 1974). In effect, this was a loss of 96 hours for Russian Mission subsistence fishing per summer including the early and late commercial seasons. This was relatively minor compared with nearly 50 percent reductions in fishing times in districts 1 and 2 until they had only three days of fishing per week over the same time period (Wolfe 1982a).

In 1977, District 3 weekly commercial periods changed to two 48-hour periods with one 24-hour closure in between. There was a loss of 24 hours of fishing per week. More importantly, four consecutive days of fishing were prohibited, which made subsistence fishing during commercial seasons, especially with a set net, an unattractive venture. Nets had to be pulled for one day. Elderly people, in particular, viewed this as a hardship. Additionally, in 1977, a regulation was put into effect that instituted a closure of two days per week from 6 p.m. Monday to 6 p.m. Wednesday, in all lower Yukon districts when there was a commercial season closure of more than five days. This cut into uninterrupted subsistence fishing between commercial seasons. However, this regulation was repealed in 1982.

District 3 boundary redefinition occurred in 1975 and 1978. The latter change was more critical because it facilitated participation in the more lucrative District 2 commercial fishery by Russian Mission fishermen. The upper boundary of District 2 was moved further upriver from Owl Slough near Marshall to Toklik, above Ohogamiut, which has remained the boundary (Alaska Department of Fish and Game 1978). According to local respondents, this change was requested by fishermen from the lower two districts who felt crowded in the previous district boundaries. It made it easier and more economical for Russian Mission fishermen to participate in District 2 commercial fishing. The closer boundary meant they spent less on gasoline to get to District 2 and were closer to more fish buyers and tenders.

The next regulatory decrease in fishing times occurred in 1979 when late season (after July 25) semiweekly 48-hour openings were reduced to 36-hour openings. Weekly fishing periods during the early season were reduced the following year to match the late season. These weekly fishing periods of two 36 hours long each, with a 24-hour closure in between, remained in effect in 1984.
Although progressive decreases in fishing times have negatively affected subsistence fishing opportunities for Russian Mission residents, the adversity of impact has not been as severe as it was for residents of the two lower Yukon districts, particularly those who do not or were not able to drift for salmon (Wolfe 1982a). Several environmental features of the District 3 area and local preferences for dry salmon products, which were discussed previously, have somewhat mitigated against progressively constraining impacts of the commercial regulations on the subsistence salmon fishery in the lower districts.

As mentioned, king salmon and summer chum, the most important salmon species for human consumption, reach the Russian Mission area well before the usual start of the commercial fishery in District 3. This allows most needed subsistence salmon to be harvested prior to the commercial season, even with requisite harvest intervals to conserve labor force energy and not overload facility space. Also, run sizes generally are quite large for efficient and productive fishing, so most families did not need to do much fishing once the commercial season started.

Set gill net sites used by Russian Mission residents were plentiful and usually productive (Fig. 7), except if high or low water levels decreased productivity. Then, drifting can be employed, which is more efficient, but involves more outlay of cash for gasoline and motor oil. As in the two lower districts, drifting has increased, according to Russian Mission residents, to alleviate pressure of declining subsistence fishing opportunities. However, it was the preferred method for most fishermen who were involved in both the commercial and subsistence fishery in 1984.

Although the proposal to switch to sequential commercial and subsistence fishing periods during commercial seasons in districts 1 and 2 was not adopted, the Board of Fisheries did allow more subsistence fishing periods during the early commercial season which were not tied to commercial openings. They allowed weekend openings every other week in districts 1 and 2. Russian Mission residents who fish both commercially and for subsistence in districts 1 and 2 utilized the extra weekend subsistence fishing time provided by regulations to improve the conditions described by Wolfe (1982a).

In lower Yukon River communities, many subsistence fishermen were also involved in the commercial fishery. Russian Mission was no exception; all commercial fishermen participated in the
subsistence fishery in 1984. However, even though personnel of both commercial and subsistence fishing are well integrated, timing of each fishery in District 3 in 1984 were nearly discrete and sequential, due to local choice, regulatory constraints, and environmental conditions. One loss that some Russian Mission residents reported was their lack of qualifications for limited entry permits.
CHAPTER 4

MOOSE HUNTING

INTRODUCTION

Moose (*Alces alces*; called *tuntuvak*, meaning "large caribou") has been an important subsistence resource to residents of Russian Mission. Issues surrounding moose population and management in the area prompted more in-depth attention to use of this resource in this study. Reductions in season lengths in Game Management Unit 18 as well as perceived increases in effort were some of the concerns (Lower Yukon Fish and Game Advisory Committee, 1984).

MOOSE HUNTING IN 1984-85

Data collection and analysis of moose hunting and use of moose was conducted both by household and hunting party. A total of 32 households (65 percent) hunted moose in the 1984-85 regulatory year. Of these 27 (84 percent) were successful and harvested a total of 33 moose. Each household harvested at least one moose (Table 9). Moose hunting households had an average size of 5.8 persons compared to 2.9 persons for households that did not hunt moose (Fig. 16). Almost none of the households with one or two people (*n* = 11) hunted moose; most of these households contained elderly people or single parents and a child. The average age of heads of households with moose hunters was 40.8 years compared to 49 years for heads of households without moose hunters (Fig. 17). Sixty-five percent of all households that did not hunt moose received moose meat after the fall season.

The "fall" season, which, in this study, included a time period from mid-August to mid-October, had the most hunting households. Twenty-nine Russian Mission households, representing 59 percent of all households, contributed members to 24 hunting parties (Table 9). In fall, most (92 percent) hunted within the September 1-30 moose season. Twenty-four percent of the households with members who hunted moose in the fall contained more than one hunting party. In most cases,
initially unsuccessful parties with members from one household went hunting again or recombined members for subsequent hunts usually until they were successful.

In the winter season, which in this case incorporated the times from late November through early January and the month of February, 15 households had members who hunted moose in 12 hunting parties (Table 9). Most (75 percent) hunting parties hunted moose within the November 15-December 31 opening. Of the 15 households that hunted in the winter season, 3 households had not hunted in the fall season.

TABLE 9. MOOSE HARVEST AND EFFORT BY SEASON, HOUSEHOLD, AND HUNTING PARTY IN RUSSIAN MISSION, REGULATORY YEAR 1984-85

<table>
<thead>
<tr>
<th>Season</th>
<th>Number moose harvested</th>
<th>Number households with hunters</th>
<th>Number successfully harvesting</th>
<th>Number hunting parties</th>
<th>Number successfully harvesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Fall&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>29</td>
<td>22</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>&quot;Winter&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>15</td>
<td>9</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Total for regulatory year</td>
<td>33</td>
<td>32^a</td>
<td>27^a</td>
<td>36</td>
<td>28</td>
</tr>
</tbody>
</table>

^aSome households hunted in both the "fall" and "winter" seasons.

Fall Season: Hunting Parties

There were 24 moose hunting parties involving a total of 37 individuals in the fall season. Hunting parties contained 1 to 4 members with 2.1 members as the average. Approximately one-half (54 percent) of all hunting parties drew membership from one household. The remainder were drawn from two or three households. One-fourth of the parties were composed of one hunter and another one-third had two hunters. The remainder (42 percent) had either three or four hunters. Two parties
Figure 17: Age of household heads of moose-hunting and non-hunting households in Russian Mission, 1984.
included relatives and friends from other communities -- Atmautluak, which is one of the "tundra villages" between the Yukon and Kuskokwim rivers, and Napaskiak, a community along the lower Kuskokwim River.

In instances when the hunting party had more than one hunter, its composition was recorded in terms of each member's relationship to the owner of the boat used by the party. Most hunting groups were composed of brothers-in-law (24 percent), with sons and friends or "unspecified relatives" of boat owners as the next most common members (each accounted for 16 percent). Secondarily, hunting groups included nephews, wives, and cousins (each accounted for 12 percent) as members, and brothers as the least frequent relationship category (8 percent) between boat owner and hunting party member. "Unspecified relatives" were people with whom kinship relations were known to exist, but the exact nature of the kinship connection was not known. Recruitment and composition of moose hunting parties was different from subsistence salmon production units. Kinship links between moose hunting partners were more often less well-defined; salmon production units generally adhered to extended-family boundaries.

Over one-half (54 percent) of the hunting parties spent one week or more hunting moose in the fall. The average time spent hunting moose by the 24 hunting parties was 9.7 days with a range of 1 to 31 days. Over one-third (38 percent) of the hunting parties which hunted in the fall took one-day trips. The average number of hunting trips per party was 7.7 trips each. Thirteen percent took as many as 21 to 30 trips to hunt moose in the fall. Trips that spanned more than a day included camping in one to as many as four different locations for six hunting parties. Cabins, tents, or boats with visqueen or canvas covers were used as sleeping quarters on overnight hunting trips.

The average amount expended in the fall season by hunting party was $244.50, with a range of $8 to $600. The 24 moose hunting parties spent an estimated total of $5,868 on gasoline, oil, food, and camping supplies in the fall season.

A total of 23 moose were harvested by 18 of the 24 parties which hunted in the fall season for an average of 0.96 moose per hunting party and 1.3 moose per successful hunting party (Table 9). Although information on sex of moose caught was not consistently gathered, most known kills
(94 percent of 19 known cases) were of bull moose. Most (67 percent) got one moose; the remainder got either three or four moose per party. The successful groups differed in some respects from hunters who were not successful in harvesting moose. Successful parties had more members (2.2 compared to 1.7) and spent more money ($258 compared to $204) on the average than those who did not get moose in the fall. Conversely, those who were successful spent less time (9.0 days compared with 11.6 days) and took fewer trips (6.7 as opposed to 10.8 trips) on the average than those who did not get moose. Successful hunting parties camped overnight more frequently rather than taking day-trips from the community to hunt moose.

Moose were always divided among other party members who were not successful. An average of 24 percent of the edible moose products were shared with people from households other than the party that got the moose in the fall. The amount of moose meat shared with other households ranged from 5 to 100 percent. As with distribution of salmon, primary kin (parents and siblings) were the most common recipients of moose meat, and parents- and siblings-in-law were the next frequent recipients. A few parties shared with unspecified relatives and friends, both within and outside of the community.

**Winter Season: Hunting Parties**

The "winter" season includes time from late November through early January and the month of February. A higher proportion of the 12 winter moose hunting parties (41 percent) were composed of solitary hunters compared with the fall season (25 percent), and had a lower average hunting party size of 1.6 members compared to 2.1 members in the fall season. Fifty percent of winter hunting groups were composed of 2 hunters and only 9 percent had 3 hunters. Composition or relationships between winter hunting party members were similar to those in the fall hunting season.

The range of expenditures for winter moose hunting parties was between $60 to $250. Winter moose hunting parties spent an estimated total of $1,510, averaging $126 for each hunting party. Most hunting groups (53 percent) hunted for more than 7 days with 7.3 as the mean number of days spent moose hunting in the winter. The 12 hunting parties made an average of 6.9 trips, with a range of 1 to
16 trips, thus most trips spanned less than one day. Only one hunting party reported camping out to
hunt moose in winter 1984-85.

A total of 10 moose were taken by as many hunting parties in the winter season, averaging .8
moose per party or 1 moose per successful party (Table 9). As in the fall, sex of moose killed was not
always documented, but most known kills were of bull moose. Most (80 percent) of the edible moose
products obtained in the winter hunt were used in the Russian Orthodox Christmas ("Slavic")
celebrations in January. Very little hunting occurred in January throughout Slavic celebrations, which
included remembering and honoring those who have died. The remainder of the moose was harvested
in February to replenish the larder of food used during Slavic activities. A comparative analysis
between successful and non-successful hunting parties during the winter season was not done because
the sample of non-successful parties was too small (n=2).

The 1984-85 winter was the second consecutive relatively snowless winter with concomitant
late freeze-up in the area. After freeze-up (late November to early December), very cold wind chills
prevailed throughout the rest of the winter season. These conditions reduced the number of moose
hunters, because of unsafe travel and the wear and tear on equipment. It also increased the
participants in the fall 1984 season because winter 1983-84 had similar conditions. Many Russian
Mission households preferred to get moose in the winter season because the meat can be stored
outside in caches or qengneret, or storage pits. The generator supplying electricity has recently had
extended outages because of increasing demands by the growing community, resulting in spoilage of
freezer-stored food. Other stated reasons for focusing on the winter season for moose hunting were
because it was generally easier to transport moose and there was less competition from hunters from
other areas. Additionally, meat was fresh for use in Russian Orthodox celebrations in January.

Hunter Characteristics

There were a total of 48 individuals (5 women) who tracked and hunted moose in 1984-85. An
additional 15 individuals went to base camps or accompanied hunters, mostly in the fall season. These
were wives and children of hunters. Most conducted other subsistence activities, such as berry picking, plant gathering, waterfowl hunting, and fishing with nets. These 63 people represented 27 percent of the Russian Mission population.

The average age of the 48 hunters was 32.1 years. Fifty-eight percent were between 21 and 40 years of age; 23 percent were between 8 and 20 years of age; and 19 percent were between 41 and 65 years of age. Almost all men (81 percent) in Russian Mission from ages 25 to 49 hunted moose. Five women hunted with their husbands.

Twenty-one percent of the hunters hunted in more than one season, which included times other than the fall and winter openings. One-third of those who hunted in winter did so because they were unsuccessful in the fall season. Six percent of the 48 hunters were successful in all the times they hunted moose, with one getting as many as four moose in the regulatory year. Their harvests accounted for 20 percent of the moose caught in the regulatory year.

A few hunters in the community, like some of those who took more than one moose in the regulatory year studied, were considered to be the most consistently productive in moose hunting in recent years. Their catches were shared widely among households or in community feasts, such as those held during Slavic celebrations. Their success was attributed to "good luck" (Charnley 1984) and to acquired skills. Although it was common for them to participate and sometimes excel in other harvesting efforts, these productive moose hunters were not necessarily consistently active or particularly well-skilled in other subsistence pursuits. Well-rounded successful hunters and fishermen are referred to by the Yup'ik term nukalpiat, or "hunters in their prime." These men travel often in the area, sometimes in conjunction with other subsistence activities, such as trapping or wood collecting.

The bag limit of one moose per hunter in a regulatory year prompted some hunters who exceeded the limit to assign additional harvests to other members of their households. However, most did not report their multiple harvests in the established state harvest reporting system (Alaska Department of Fish and Game 1984). Very few hunters went through the fall moose hunter check station at the mouth of the Paimiuat River because many of them hunt downriver from the check station. Also, reporting into the check station was voluntary.
Processing and Use

Processing and use of moose products by Russian Mission residents were very similar to methods reported by Charnley (1984) for Chuathbaluk and Sleetmute along the lower Kuskokwim River in the early 1980s. In addition to preparing a considerable amount of meat and organs to be eaten fresh, particularly moose that is taken in the winter season, moose meat was frozen or dried for later use. Few people reported canning meat. Organs and parts such as liver, heart, tongue, head, hooves, stomach, intestines, and stomach fat were eaten.

Few households reported tanning moose hides during the study year, however, some had in the recent past. Others noted they planned to do so in the future. A few sent pieces of hide to be commercially tanned to make slippers and bags for local use or sale. Most had given parts of the hide with fur to dogs or used pieces to sit on while ice fishing.

AREAS USED TO HUNT MOOSE

As with mapping of all other land use information in this study, documenting moose hunting areas used by residents of Russian Mission focussed on the more recent 5-year period from 1980-84. These areas were within Game Management Unit (GMU) 18, and subunits 19A and 21E (Fig. 18). Most respondents noted that the areas depicted in Figure 19 have been utilized for moose hunting since approximately the early-1960s, which was when moose became relatively well-established in the land use area of Russian Mission residents.

The area used for moose hunting by Russian Mission residents included the river and slough corridors extending 220 river miles from the lower Innoko River, a tributary of the Yukon River, downstream to Ingrirarnmiut along the Yukon River below Russian Mission (Fig. 19). The lower portion of the Bonasila River, another tributary of the Yukon River below Anvik was used by Russian Mission moose hunters. The area from its mouth downstream to the mouth of the Innoko River was
Information collected from 32 households (65% sample).


Resource use areas change through time and are not fixed entities. Land outside these areas should not be assumed to be less important to community residents.

Fig. 19. Areas Used by Residents of Russian Mission for Moose Hunting in 1980-84.

- Moose Hunting
also used. Finally, the area along Paimiut Slough, as well as portions of the upper reaches of the
Johnson and Reindeer rivers were used for moose hunting (Fig. 19).

The rivers, sloughs, and navigable lakes served as important travel routes in both winter and
during open-water hunting. Winter hunting involved more extensive exploration away from waterways,
such as over a pass between Kako Creek and the tributaries of the Atchulinguk River north of
Marshall (Fig. 19).

The Innoko River area, primarily within GMU 21E, hunted by Russian Mission residents
included areas used by neighboring Athabaskan Indians upriver from Russian Mission. Elders noted
that much of this area had been used by Paimiut residents earlier in this century, and perhaps before
then, for various activities, such as bear hunting. Some Paimiut families had kinship links with Holy
Cross people. Many former residents of Paimiut moved to Russian Mission in the latter half of this
century. These traditional ties were offered as a factor in their "tolerated" use of the Innoko River area
for moose hunting.

TRENDS IN MOOSE POPULATION AND HUNTING EFFORT

In 1984, Russian Mission elders reported that when they were children, they remembered
hearing that moose were moving progressively downriver from areas upriver in both the Yukon and
Kuskokwim river drainages. As the upriver moose populations increased, their numbers expanded
toward the lower portions of the two large drainages resulting in more frequent moose sightings (Kari
1983; Stokes 1985). Accounts of moose in the area have been documented since the 1840s. In June
1849, Netsvetov (1984 [1860]) and his crew overcame a fresh moose carcass crushed by jammed ice
during breakup in the Ohogamiut area. Many elder respondents reported that in their parents'
memory, which would have been since the late 1800s, moose harvested by them in the Innoko River
area and the Yukon River corridor upriver to the vicinity of Anvik was an infrequent event. Moose
were caught incidental to other activities, such as trapping, hunting other animals, berry picking, wood
collecting, and fishing.
Although targeted moose hunts by Russian Mission residents were relatively well-established in the lower Paimiut Slough by the middle part of this century, moose sightings in the vicinity of Russian Mission were still infrequent (Helmericks 1944). Most elders remembered the first moose that they themselves saw in the area. Around 1935, a cow moose and two calves crossed the Yukon River ice towards Russian Mission. All three moose were killed and eaten. Former residents of Ohogamiut saw moose near that community for the first time approximately a decade later (ca. 1943-45). Since then, moose populations increased steadily in the immediate area. With the population increase, Russian Mission residents began a pattern of moose hunting around Paimiut Slough, Tucker’s Slough, and the forested and high brush uplands which occur downriver to the vicinity of Ohogamiut. In 1957, a survey of wildlife harvests in the Yukon Basin estimated an annual harvest of 15 moose combined for Paimiut, Russian Mission, and Ohogamiut, whose aggregate population was 121 people (U.S. Department of the Interior 1962). Russian Mission accounted for 12 moose harvested and 90 people. The ratio of moose harvests to human population size in 1957 is only slightly lower than that documented in this survey: 0.13 and 0.14, respectively.

There was much speculation about why moose have been migrating downriver along the Yukon and Kuskokwim River corridors. Most Russian Mission people agreed that their numbers have increased in the interior over the years, so much that they have had to find new areas (Nelson 1973, 1983). Decline of caribou populations and proliferation of beaver in the mid-1800s was thought by some respondents to set the stage for moose migrations into the area. Reports of vast forest fires between 1915 and 1920 in the upper Kuskokwim and middle Yukon River areas spurred movement of moose from the interior toward the Yukon River delta area (Alaska Department of Fish and Game 1976). A few key respondents mentioned increases in the human population and their activities upriver, notably the growth of Fairbanks, and military bases and installations contributing to displacement of moose. Relatively milder winters with less snowfall which have been more common in recent years were thought to contribute to overall reproductive success and eventual increased expansion of moose populations. Lastly, the recent noticeable increase in number of forest and tundra fires in the area was thought to attract and drive moose even further downriver to the delta area. The
location of Russian Mission, which is in the area where the Yukon and Kuskokwim rivers are closest to each other, provides residents access to the convergence of two migrating populations of moose. This was thought to contribute to the relatively rapid proliferation of moose in the area.

Approximately 20 years ago, hunters from downriver communities began going upriver to the vicinity of Russian Mission to hunt moose, primarily in the fall. Some of these hunts were coordinated efforts arranged during the commercial fishing season with residents of Marshall and Russian Mission. Occasionally, downriver hunters, as well as people from Kuskokwim River and "tundra" communities would come upriver to hunt in winter, especially after snowmachines became more common for winter transportation.

Although moose hunting behavior by some hunters from lower Yukon River and coastal communities were perceived by Russian Mission hunters as unsafe, primarily because of unfamiliarity with forested environments, they did not complain about them. Some Russian Mission residents offered that they would not be as knowledgeable about proper practices for hunting in the ocean or sea ice as coastal residents. Some people from downriver who came up to or through the area to hunt moose were related to people in Russian Mission, and brought seal oil or other sea mammal products as gifts. A few local hunters pointed out that most downriver passed through, rather than hunt in the area most intensively hunted by Russian Mission residents (Ohogamiut to Tucker's and Paimiut sloughs), so potential conflicts were minimized or non-existent. No one from Russian Mission expressed strong opposition to hunters from lower Yukon River communities going into or through their area, but acknowledged that residents of Holy Cross and Shageluk perhaps had legitimate complaints about the increasing influx of hunters into the areas they traditionally hunted.

This influx of hunters reportedly became more pronounced in the early 1970s, particularly during fall hunting season. Guided hunts in the Paimiut Slough area brought in hunters from Bethel and other areas outside of the region (Alaska Department of Fish and Game 1976). Local residents had problems with guided hunts because use of aircraft was viewed as giving them unfair advantage to spot, kill, and transport moose. This prompted establishment by the Alaska Board of Game in 1977 of a "controlled use area" within GMU 18. The Kalskag Controlled Use Area incorporated a triangular-
shaped region from Russian Mission upriver to the old Paimiut village site, south to Lower Kalskag and northwest back to Russian Mission (Alaska Board of Game 1977). The use controlled in the area was that of aircraft in moose hunting, including transport of hunters and moose products into or out of the area. These prohibitions were not to apply to scheduled flights between communities (Alaska Board of Game 1977). These regulations were intended to protect the moose population and provide opportunity for hunting by local residents.

Russian Mission hunters reported that the moose population in the area they use to hunt moose was predominantly made up of cows, with relatively few bulls in the early 1980s. A few hunters reported taking cow moose after seeking bulls throughout open hunting seasons in the early 1980s. There were places, such as Tucker's Slough, which were thought to be good calving areas, where few bulls were found. One option proffered was to have antlerless seasons established in portions of GMU 18, excluding known calving areas.

REGULATORY HISTORY

This discussion focuses on regulatory changes in areas within which Russian Mission residents hunt moose (Fig. 18). Reductions in open seasons for moose hunting within these areas were reported as the most troublesome aspect of the moose regulatory system. Although they reported that moose were hunted and taken throughout the year, most effort and harvest occurred within established open seasons.

At the time of statehood, moose populations in the middle Yukon and Kuskokwim River drainages were thought to be at their peak, although this perspective is primarily through the benefit of hindsight (Alaska Department of Fish and Game 1976). Open seasons and bag limits were relatively liberal. In 1963, all areas had open seasons for 6-1/2 months of the year. In GMU 18, there was a bag limit of one bull and GMUs 19 and 21 had a bag limit of two moose, one of which could be antlerless. Reductions in season length were implemented in 1965. The open season in GMU 18 was reduced to 4 months and 25 days, while moose hunting seasons in GMUs 19 and 21 were reduced to 4 months in
length. In 1973, after a severe winter with high moose and calf mortality, the bag limit and seasons in GMUs 19 and 21 were reduced to one bull moose and three months, respectively (Alaska Board of Game 1972; Alaska Department of Fish and Game 1976). Game management unit 18 restrictions followed in 1975 with a reduction to a four-month season.

As mentioned above, in 1977 the Alaska Board of Game established the Kalskag and Paradise Controlled Use areas in GMU 18 and GMU 21, respectively. Russian Mission residents had hunted moose within both controlled use areas for several decades. According to local respondents, that action eliminated much of the competition from guided hunts operated by Bethel residents out of base camps in the lower Paimut Slough and Reindeer Lake area.

In 1981, multiple open seasons and overall reductions in legal hunting time during the regulatory year were established in subunits 19A and 21E. These two subunits had a fall season (September 1-25 in 19A and September 5-30 in 21E) and a "winter" season (November 20-30 in 19A and November 1-30 in 21E). Subunit 19A also had a late winter season (February 1-10). Game management unit 18, excluding the lower Yukon River delta, still had one consecutive season of four months in length until 1982, when open seasons were implemented for the fall (September 1-30) and winter (November 15-December 31). Overall open hunting time was two and one-half months per regulatory year. This configuration of open seasons and bag limits within the Russian Mission moose hunting was in effect during the 1984-85 regulatory year.

As mentioned above, the 1983-84 winter season had poor travel conditions for moose hunting, so the 1984 fall season reflected increased effort by Russian Mission residents. The 1984-85 winter was like the previous one, with a late freeze-up and little snow cover. In general, most families reported that they usually attempt to get moose in the winter (both November-December and February seasons), because meat is easier to preserve, there is reduced competition, and hauling one's catch involves less packing by hunters. Additionally, there is more need for moose in winter for Russian Orthodox celebrations in January. Moose caught prior to Slavic is used up and replenished in February. The seasonal round reflects this pattern and there were open seasons within their hunting area (GMUs 18, 19A, and 21E) that minimally accommodated this pattern.
In 1984 and 1985, Russian Mission moose hunters went to GMU 21E during the February season in that unit, as GMU 18 was closed. Some respondents wanted an antlerless moose season in February in GMU 18, in addition to the existing fall and winter seasons. This was partially implemented in 1985 when a February season was established. However the November 1-December 31 season was abolished at the same meeting (Alaska Board of Game 1985), which proved more troublesome for Russian Mission residents. In 1987, the winter season was reinstated and the February season was deleted in GMU 18 (Alaska Board of Game 1987).

Increased competition from hunters using snowmachines, primarily from the Kuskokwim area, was a factor discussed in the Board of Game's reluctance to allow an extensive February moose season in GMU 21E, or GMU 18 (Alaska Board of Game 1987). The area from Tucker's Slough to Paimiut Slough is one of a few areas within GMU 18 known by local residents to have relatively high moose populations in the winter. A few Russian Mission hunters viewed increased competition in that area of GMU 18 as a certainty if it were delineated as a subunit with winter seasons. Because moose are antlerless in late winter, potential increased harvest of cows was another concern the board expressed (Alaska Board of Game 1987), a concern not shared by local residents. Several Russian Mission residents said they preferred to continue to hunt during and around the existing limited moose seasons in the area, rather than increase the number of or lengthen seasons. They thought the existing moose regulatory structure, though not very convenient, served well to discourage increased competition from non-local hunters.
CHAPTER 5
OTHER FRESHWATER FISHING, HUNTING, TRAPPING, AND GATHERING

INTRODUCTION

The documented subsistence use area of Russian Mission residents for 1980-84 included roughly 6,500 square miles of land and discontinuous areas along the Yukon River extending approximately 260 miles in length (Fig. 20). They also used areas along the Innoko River, extending approximately 60 miles up the river. These areas encompassed lands within state-defined Game Management Units 18, 21E, 22A, and 22E (Figs. 18 and 20).

Although detailed uses of land by Russian Mission, Ohogamiut, and Paimiut residents prior to abandonment of the latter two communities in the 1940s and 1950s were not systematically mapped, general information was documented from key respondents from their respective communities. Prior to the influx of Paimiut and Ohogamiut residents, Russian Mission use area extended from about Nuugluaq, a former seasonal camp above Ohogamiut, included the area across the Yukon River to the Portage Lakes, the upper Johnson River, and the area up the Yukon River to and including Tucker's Slough. Former residents of Ohogamiut were oriented more to the area surrounding their community including portions of the Johnson River near their settlement downriver to Takcarmiut. Residents of the former settlement of Paimiut used areas that overlapped with those of original Russian Mission residents, such as the Tucker's Slough and Portage Lakes areas, but also used areas extending to the Kuskokwim River near Lower Kalskag and up the entire drainage of Paimiut Slough and the lower Innoko River. Residents, including those who previously lived in Paimiut and Ohogamiut, hunted for caribou and trapped in the mountains on the north side of the Yukon River opposite the outlet of Paimiut Slough downriver to the vicinity of Takcarmiut, up to the divide between streams draining into the Yukon and those draining into the Bering Sea. Also, residents of all three communities hunted moose in the Paimiut Slough and lower Innoko area.
Fig. 20. Areas Used For Hunting, Trapping, Fishing, And Gathering By Residents Of Russian Mission In 1980-84.

All Subsistence Use Areas Combined

Resource use areas change through time and are not fixed entities. Land outside these areas should not be assumed to be less important to community residents.
The areas used 40 years ago do not differ much from those used in the early 1980s, depicted in Figure 20. Additional areas used since the 1940s were in the upper Andreafsky River drainage and the area from the mouth of the Innoko River up the Yukon River to the Bonasila River mouth, and the lower Innoko River. Areas surrounding Marshall and Upper and Lower Kalskag were not reported as used between 1980-84 as they had been about 40 years ago (Fig. 20).

The seasonal round (Fig. 21) depicts usual and intermittent or incidental harvest times for wild resources by Russian Mission residents. Usual harvest times reflect a number of factors: when a resource is present in sufficient numbers to allow efficient harvest (Graburn and Strong 1974), such as salmon, Arctic lamprey ("eels"), and waterfowl migrations; when a particular technology can be used to obtain large numbers of a resource, such as burbot traps in early winter; when a particular resource is preferred for taste, such as black bear in early fall; or quality of its by-products, such as pelts of furbearers; or when the legal open season will allow harvest. Incidental harvest times show when a species can be caught while targeting another species, such as sheefish which is incidentally caught while "jigging" through the ice for burbot and pike in late winter, or in nets set for salmon throughout the summer (Fig. 21).

The seasonal round is representative of activities within the five-year period from 1980 through 1984. The inclusion of five years of activity was to allow for fluctuations in effort due to personal circumstances, such as poor health or equipment failure, and environmental conditions, such as when a late freeze-up over several years prohibited "dipping" for Arctic lamprey, locally called "eels," in 1982-84. Another example of natural processes affecting harvest effort occurred over century ago, according to elders. Beaver population proliferation and concomitant water course changes due to beaver activities resulted in decreased blackfish and whitefish productivity in some lakes and streams which discouraged fishing effort for those species in those areas.

Comparisons of seasonal activities reported by Netsvetov (1984 [1860]) from 1846 to 1860 suggests that, although many current activities occurred in roughly the same time of year as they did a hundred years ago, there have been some variations due to technological, population, environmental, and climatic changes. Fishing for most non-salmon species currently occurs more often throughout
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Key:
- Primary periods of harvest
- Occasional periods of harvest
- Little or no harvest

Fig. 21. Russian Mission seasonal round, 1984. (Continued on next page.)
the seasonal cycle, probably because of more versatile technology. Nets made with modern materials can be set for longer periods in more places than sinew, baleen, or linen nets or traps and fences. Current moose hunting activities were not part of the seasonal round during the 1846-1860 period. Moose migration from upriver and their eventual proliferation in the Russian Mission use area was
discussed earlier. Fishing for eels occurred usually in mid- to late-October, based on the "Old Style (Julian)" calendar used in Netsvetov’s tenure (1984 [1860]); that calendar was 12 days behind the "New Style (Gregorian)" calendar. Calendric differences account for much of the variation in eel fishing times; in the 1980s, residents report that early to mid-November has become the more typical time for eel dipping. However, they also said winters seemed to have become milder during this current century, so that freeze-up and fish runs are delayed to later months.

The subsistence annual cycle from the perspective of Russian Mission residents wraps up and begins again in the late spring time when river ice breakup allows water navigation. Several reasons were offered for this view. Traditionally, this was often a difficult time of year. Most of the food stored for the winter, primarily salmon, was used up and necessitated replenishment at this time of year. Although many resources reappeared at this time, such as salmon, sheefish, whitefish, black bear, and waterfowl, weather, ice conditions, severity of the winter, and health of the people could adversely affect their success in harvest. Once Russian Orthodoxy was introduced, this time of year gained in significance; it usually coincides with Russian Orthodox Easter, an important period in the ceremonial cycle of Russian Orthodoxy.

The following presentation of non-salmon fishing, caribou, bear, waterfowl, and small game hunting, trapping and gathering generally follows the chronology of the annual cycle, by the general categories of fish and non-fish resources. Moose hunting and salmon fishing were described earlier in previous chapters. Other areas used for subsistence hunting, fishing, trapping, and gathering, as well as methods of harvest and use are discussed below. Some subsistence activities or techniques of fishing, such as setting burbot traps and fences, are integrally tied to the sites where the activity occurs.

NON-SALMON FISHING

An important feature of the Russian Mission seasonal round during the 1980s was that fishing occurred all year round (Fig. 21). As respondents noted, one can enjoy fresh fish of some sort
practically any day of the year, with the brief exceptions during river ice freeze-up and breakup. Even then, "hooking" from shore-fast ice on the river bank during early freeze-up occurred.

As with all other Central Yup'ik communities where subsistence research has been conducted, the importance of fish in the world view and diet of Russian Mission residents was evident not only in the wide array of species harvested generally throughout the year, but also by the proportion of subsistence output (Wolfe 1979, 1982b; Fienup-Riordan 1986; Andrews 1989). The Yup'ik word for food, neq'a, is also the general term for fish.

At least nine general categories of non-salmon fish were harvested by Russian Mission people in the 1980s (Fig. 21) including a variety of species. Some were caught in low numbers, so they were lumped with other more numerous species. These included round whitefish (Prosopium cylindraceum), least cisco (Coregonus sardineus), and stickleback or needlefish. Respondents identified two categories of "small whitefish" that were different from those discussed below. They were likened to young broad whitefish and referred to as neqyagaat and iituilaarat, meaning "little fish" and "ones with big eyes," respectively. The former term was also used to refer to Bering cisco and the latter was usually applied to whitefish fry. Fishing for needlefish (stickleback), called quaruut, was noted in oral tradition during times of starvation; people had to go toward the coast to get needlefish for themselves or asked for it from those who usually harvested it. It is known as a very important back-up resource during times of starvation and hardship throughout the Yup'ik region. Otherwise, it used to be primarily fed to dogs after an initial use as human food when it was first harvested in the annual cycle in coastal areas that have access to it.

All non-salmon freshwater fish species also were used as dog food, depending on their condition and quality when pulled from nets or traps. Fish dead for some time in set nets, or with skin torn by other fish, were given directly to or cooked for dogs, or stockpiled over time until there was enough to feed the entire team.
Sheefish

Although sheefish (*Stenodus leucichthys; ciitq*), can be obtained year-round, they were targeted for harvest in spring and fall, when they were considered best for eating (Fig. 21). Sheefish are the first fish species available in appreciable numbers immediately after river ice breakup around late May to early June when they migrate upstream to spawn (Alt 1977; Morrow 1980). This run was locally called the "ocean run" in English and *kuigpatat* in Yup'ik, meaning "things of the Yukon," to distinguish them from sheefish caught at other times. This run was noted for having large, firm-fleshed sheefish, some as large as king salmon. Salmon gill nets, 5- to 8-3/4-inch stretched mesh, were used to catch this run of sheefish. They were set in generally the same eddies used to fish for king and summer chum salmon as noted earlier when the latter part of the sheefish run overlaps with the early king salmon run (Fig. 21).

Sheefish caught in spring were consumed in a variety of ways. Many were eaten fresh, whereas others were processed like chum salmon in preparation for drying. They were smoked, dried, and stored for later use. The remainder were half-dried, smoked, and boiled for immediate consumption.

In fall, nets of smaller mesh sizes (4 to 6 inches) were set at mouths of creeks or in the Yukon River (identified as "whitefish nets" in Figs. 22 and 23), when sheefish leave the creeks and streams to go to overwintering grounds in the delta (Alt 1977; Morrow 1980). Sheefish caught at this time were referred to as *kuigpat* or "those of the rivers" (as opposed to the Yukon). They were notably smaller in size than the ones harvested in spring and were primarily eaten fresh, or boiled and strained for the basis of *akutak*, a mixture with berries. Some were frozen or half-dried and later boiled. Complete drying as in the spring run was usually prohibitive in the fall due to rainy weather.

Sheefish were also caught incidentally while "jigging" through the ice throughout the winter for burbot, pike, and whitefish and in burbot traps and whitefish nets set under the ice. These species were also caught incidentally in nets set for sheefish.
Resource use areas change through time and are not fixed entities. Land outside these areas should not be assumed to be less important to community residents.

Fig. 23. Areas Used for Hooking Through the Ice and for Setting Whitefish Nets by Residents of Russian Mission In 1980-84.

- ▲ Hooking Through the Ice (Burbot, Pike, Sheefish, Whitefish)
- ■ Whitefish Set Nets

Information collected from 20 households (41% sample).

Arctic Grayling and Dolly Varden

Arctic grayling (*Thymallus arcticus*), or *culupk*, meaning "big dorsal fin;" and Dolly Varden (*Salvelinus malma*), also called "trout" in English and *iqallugpik* in Yup'ik, were fished throughout the salmon fishing season, primarily with rod-and-reel (Fig 21). Sport fishing regulations listed a daily bag limit of 15 and possession limit of 30 for grayling and Dolly Varden, combined (Alaska Board of Fisheries 1984). Since most people did not know that a sport fishing license was required for rod-and-reel fishing, few local residents ever obtained a license. Further, most people were unaware of these limits and admitted that they were exceeded at times.

Manufactured rod-and-reel gear became widely used for grayling and Dolly Varden fishing within the past two decades. Respondents reported that before purchased gear became prominent, locally made "jigging" or fishing poles were used. A long line with single, double, or treble hooks without barbs was attached to a long pole, such as a willow sapling. When bait was used, it consisted of salmon roe or entrails. Otherwise, bright pieces of yarn or cloth were attached above the hooks. If fish were not biting, this gear was used to snag them. Some people said they still would "piece together" the fishing poles if rod-and-reel gear was forgotten or broken. Fishing with these poles was most often done by children and young men around busy salmon fishing and processing times.

Kako Creek was the primary place for grayling and Dolly Varden fishing between 1980 to 1984. They were also incidentally caught on occasion in whitefish and salmon nets. Most of the catch was eaten fresh for variety in a diet of primarily salmon. Even if the catch was considerable, it was shared widely in the village or with all families at fish camp. Some dried and smoked Dolly Varden--this was a delicacy. Those incidentally caught in whitefish nets in the winter were also eaten frozen.

Whitefish

Whitefish are also present year-round in varying degrees of abundance and flesh quality (Fig. 21). Two species of whitefish were harvested by residents of Russian Mission -- broad whitefish
(Coregonus nasus; kaurtuq or akakiik, the latter term used primarily by people originally from the Kuskokwim) and humpback whitefish (Coregonus pidschian; cingikegjik, which like Mt. Chiniklik, means "one with a good point"). Of the whitefish species, broad whitefish currently were harvested in greater numbers because of their greater abundance and a local preference over humpback whitefish.

Whitefish were targeted in late winter through early spring and again in fall before and after freeze-up, a time when residents reported the greater proportion of the annual catch (Fig. 21). In spring, as whitefish move up into streams and creeks, people set nets and began hooking through the ice at the outlets of or along Twelve Mile, Tucker's, Ku'ilerg, Qallangacuk, and Ickes sloughs, and Talbiksok and Reindeer rivers (Figs. 22 and 23). In fall, whitefish were harvested again as they migrated downstream after spawning and again nets were set or people hooked through the ice along the same waterways as well as near Russian Mission (Figs. 22 and 23) (Alt 1977; Morrow 1980). Their roe and the high quality of their flesh during the fall was highly prized. Whitefish were also incidentally caught while hooking through the ice for pike and burbot.

Some whitefish, primarily broad whitefish, were also called urulitkut, meaning "ones that have stopped moving around," in reference to their limited mobility in lakes without creek outlets or lakes surrounded by shallow swamp, such as those east and west of Ohogamiut, near Ickes Slough, and along Paimiut Slough (Figs. 22 and 23). Because there is no current to work against, these whitefish get very big and fat and weigh as much as eight pounds. These whitefish were taken with set nets or caught by hooking through the ice in early spring in conjunction with muskrat hunting prior to breakup. Because of their high fat content, most of these whitefish cannot be dried completely, but were partially dried and boiled or eaten fresh or frozen. Also, all whitefish were processed and prepared in the same way as sheefish, although some whitefish were fermented slightly and eaten partially or completely frozen.

Cisco

Bering cisco (Coregonus lauretia; "small whitefish") were taken by a few Russian Mission families noted for their skill in preparing them for a fermented and partially frozen delicacy. Bering
Cisco were called *imarpinaq* in Yup'ik by most people, although some referred to them as *negyagaat*, a term used to refer to other small whitefish species as noted above.

For the most part, timing of the cisco harvest coincided with whitefish, and were caught practically year-round (Fig. 21). In fact, they were usually caught in the same nets as whitefish (Figs. 22 and 23). Families targeting cisco merely used the smallest mesh size of whitefish nets (usually 3-5/8- to 4-inch mesh) and expected to intercept both cisco and whitefish. In addition to being fermented, cisco were also eaten fresh and frozen.

**Burbot**

Locally called "lush" (loche) or "lushfish" in English and *manignaq* in Yup'ik, which means "like an egg" in reference to their large, round, light-colored belly, burbot (*Lota lota*) were targeted in the months of frozen river ice. They were also caught incidentally in whitefish nets just prior to freeze-up (Fig. 21).

Between freeze-up and late February the primary means of getting burbot was by nets set under the ice and by hooking for them through the ice. Traps (*taluyaq*, sing.; *taluyat*, pl.) with fences (*capun*, sing.; *caputet*, pl.) were also used to catch burbot. These rectangular funnel traps were made of wood and chicken wire and were usually between 8 to 10 feet in length, 4 to 6 feet square, with an opening approximately 15 to 20 inches across. A wide flaring funnel set through the entrance of the trap reduced the opening through which fish swam to a circle 6 to 8 inches across. The fences that flank the entrance of the trap to guide the fish into the trap were about 10 feet wide and 7 feet in height (Crawford 1978).

Traps and fences were occasionally set from mid-November through December to intercept burbot preying on small whitefish in weak current. Between January and mid-February, burbot catches typically diminished; some people moved their traps out to stronger current at that time, but most removed them (Fig. 21). March through April was the usual time to set traps with fences in stronger current. Occasionally, hooks baited with blackfish (*geräturcat*) were also set at that time under the ice.
for burbot at a few strategic places, such as off Circle Island, south of Russian Mission, below Ickes Slough, and near Ohogamiut (Fig. 22). These places were probably at or near staging and spawning areas (Morrow 1980), as they have been used for setting burbot traps long before the time period depicted here. Semiweekly checks of these traps in the 1980s typically yielded approximately 100 to 200 burbot and occasionally may have as many as 300 to 400. A few whitefish, cisco, and pike were also incidentally caught in these traps.

Most burbot were eaten fresh. Some people boiled burbot and ate just the heads and boiled the flesh for use as the basis of akutaq. The liver and roe were considered special delicacies. Burbot that have been dead for some time in set nets were eaten frozen, if their skin was intact, otherwise they were fed to dogs. The four families that regularly set at least that many traps for burbot invariably shared their catch widely throughout the community. They received assistance in setting and maintaining the traps from members of many different households, most of whom were relatives. In one case, a Russian Mission family (formerly from Ohogamiut) regularly requested help from relatives in Marshall in checking their trap.

Northern Pike

The primary time to harvest pike (Esox lucius; luqmuuyak or keqquuli in Yup’ik, the latter meaning “one good at biting”) was just prior to and after freeze-up (Fig. 21). At that time, it was common to get mostly the much preferred large pike, which grow to over two feet and can reach close to five feet in length. There were also partially land-locked pike in generally the same areas that had big, fatty whitefish. Many of the large pike were believed to have spent part of their lives in partially land-locked lakes but were able to move out of and into interconnected water systems during times of high water.

Pike were taken in many of the same places used to fish for whitefish (Figs. 22 and 23). Remnants of nets used for chum or king salmon fishing were used to catch the large pike. Set net and
hooking sites for pike included the areas around the outlet of Kako Creek, along Portage and Twelve Mile, and Paimiut sloughs, and the lower portion of Qallungacuk (Figs. 22 and 23).

Pike were the only non-salmon species in addition to sheefish that were regularly dried in appreciable numbers. They were also eaten fresh, frozen, and mixed in akutaq. Small pike, which to local residents sometimes tasted "different," usually not as good compared with their larger counterparts, were typically fed to dogs.

Alaska Blackfish

Blackfish (Dallia pectoralis), called either imangaq by those from the lower Yukon River area or can'giiq, by Russian Mission people and those formerly of the Kuakokwim River region, were caught in traps (taluyat, plural; taluyaq, singular) set in small streams or narrow waterways between lakes. Traps were set when the streams and waterways begin to freeze in mid October and throughout much of the winter through April (Fig. 21).

Blackfish traps were made of wood, chicken wire, or hardware cloth, or a combination of these materials. These cylindrical traps measured between 2-1/2 to 6 feet in length and about 15 to 30 inches in diameter with funnel insert openings or entrances of between 6 to 18 inches (Crawford 1978). The funnel insert narrowed to an opening between 1 to 4 inches in diameter.

Most of the sites used to set blackfish traps between 1980-84 were located south of Ohogamiut and across from Russian Mission (Fig. 24). The areas around Paimiut were considered too far for regular quick trips to check blackfish traps, so their use was reportedly discontinued prior to 1980. Also, people preferred to have their blackfish traps near the areas that they used to set longline hooks for burbot under the ice, which as noted above, were baited with live blackfish.

Blackfish were consumed fresh, frozen, and occasionally as a dried product. Blackfish were braided through the gill area into strings and hung for drying. Some families only ate blackfish that came out of traps alive, and fed dead blackfish from traps to dogs. They prepared fresh, living blackfish to be eaten frozen by rolling them in clean snow until they stop moving.
Fig. 24. Areas Used For Arctic Lamprey Fishing and Setting Blackfish Traps by Residents of Russian Mission in 1980-84.

Arctic Lamprey Fishing

△ Blackfish Traps

Information collected from 20 households (41% sample).

Resource use areas change through time and are not fixed entities. Land outside these areas should not be assumed to be less important to community residents.
**Arctic Lamprey**

Referred to as eels or nemeryaq, Arctic lamprey (*Lampena japonica*) offer the shortest harvest window of any fish species (Fig. 21), as well as the most annually regular and discrete harvest area. Russian Mission residents fished for eels on the north bank of the Yukon River from Oogamiut upriver to Dogfish Village (Fig. 24).

Eels migrate up the Yukon River in great swarms around freeze-up in mid-October to mid-November. According to Russian Mission residents, they dispersed or disappeared before or just after they passed Holy Cross, 86 miles upriver from Russian Mission. The first downriver community to watch out for and harvest eels has been Mountain Village (Wolfe 1981). Further downstream, the ice usually is not thick enough to be able to fish for eels and the schools are not dense. News of the eel run was transmitted by citizen’s band radio so the next community upriver could prepare to harvest eels.

Trenches or holes were cut into the ice on the north bank of the Yukon River immediately after freeze-up. Eels were caught with dip nets (*qaluq*, singular; *qaluut*, plural) or home made "rakes" constructed with a variety of materials. Most rakes were made of 5 to 8 foot pieces of 2-by-4-inch milled lumber or long poles with tenpenny nails pounded part way into them at approximately 6-inch intervals for about half the length of the pole (Wolfe 1981; Charnley 1983). Strips of chicken wire, or old, large saw blades, trimmed so their "teeth" stuck out were also attached to 2-by-4 lumber to be used as rakes. When the rakes were slowly passed through the water toward the downriver end of the opening, the eels wrapped themselves around the nails, much like long, thin pasta collects around pasta rakes. The eels were shaken off of the rack on to the ice repeatedly until catches diminished. The operation could continue into the night with gas-powered lanterns supplying light.

Conditions most conducive to successful and productive eel fishing are safe, thick ice on the Yukon River and a strong current that appears to encourage the eels to form tighter, denser schools with nearly equal distribution throughout the water column. They tend to disperse or swim at greater depths when the current is weak. For three consecutive years between 1982-84, effective eel fishing by Russian Mission residents did not occur because the Yukon River did not freeze up adequately.
Approximately 10 tons of eels were considered typical annual harvests by the entire community of Russian Mission in the 1970s (Crawford 1978). In 1984 several people, notably those who had dog teams, reported that they preferred to get much more for themselves because the fat eels made desirable dog food, which was the most common use of eels. They estimated the community harvested just over 20 tons in 1981, the last year with good eel fishing. They were considered a delicacy when first caught and eaten fresh, baked, boiled, and sauteed.

CARIBOU AND BEAR HUNTING

Most hunting and trapping by residents of Russian Mission occurred in early fall, beginning in late September, and extended throughout the winter, and through early spring (Fig. 21). These were fishing times for non-salmon species as well. Although hunting for certain species in earlier times (prior to the 1970s) was not as constrained by imposed legal seasons and limits, elders reported that times for targeted hunting and trapping of most species resembled the current seasonal round, except for moose, caribou, and waterfowl hunting times. Most people were aware of the requirement to obtain hunting licenses annually. There was some confusion about the need for harvest tags and tickets for all large game species.

Hunting, like trapping described below, accounted for the most extensive land areas used of all subsistence activities between 1980-84. Although many uses and activities overlapped or were conducted concurrently, the areas used for procuring each resource category or species represented the areas targeted or most likely to produce the desired product in the time period 1980-84. For example, many respondents noted that they combined waterfowl hunting with fall moose hunting, and grouse, ptarmigan, and hare hunting with winter moose hunting and furbearer hunting and trapping, particularly when they were unsuccessful in their primary goals. Hence, the documented use areas for small game hunting shows much reduced expanses of land than for moose hunting, because the smaller area is the area usually targeted for small game hunting.
Caribou

Caribou (*Rangifer tarandus; tuntupik*) populations have fluctuated relatively dramatically throughout recorded history in this area (Burch 1972; Wolfe 1979). However, even in their times of abundance in the early 1800s to the 1870s, local reliance on caribou seems to have been marginal and incidental to other pursuits (Wolfe 1979). As Wolfe (1979) reported, intensive land mammal hunting in the area would detract from the established pattern of fishing in the Yukon River proper and the tributaries on the south side. Fishing effort provided relatively consistent, secure returns. Lower Yukon River residents, including Russian Mission residents, procured caribou products through trade with the *Maalimiut*, an Inupiaq-speaking group from the Seward Peninsula and northern Norton Sound region. *Maalimiut* developed expertise to harvest, dispatch, and process caribou to monopolize trade of their products in the mid-1800s (Zagoskin 1967 [1847]; Wolfe 1979).

As caribou herds were beginning to wane in the late 1870s, a few families probably had begun to develop strategies for both intensive fishing and caribou hunting, particularly those families that were employed by or closely associated with the clergy of the local Russian Orthodox church, which hired local people or designated some of their employees to hunt caribou in the spring and fall (Netsvetov 1984 [1847]). However, the herds diminished before this became an entrenched practice. Men hunted in the Andreafsky Mountains, and the hummocky area between the Yukon and Johnson rivers in the peak of herd expansion, in fall when the caribou migrated south, and throughout the winter. No one reported use of fences to catch caribou.

With the introduction of domestic reindeer early in the 20th century, people who had been involved in caribou hunting later became part owners or chose to offer their services in herding reindeer for operations managed from Mountain Village and the *Akulmiut* area. Notably, they were primarily former residents of Ohogamiut, who had more direct access to the Mountain Village and *Akulmiut* areas.

In the 1950s, reindeer herds were ravaged by wolves and remnant groups of reindeer in the lower Yukon River area never recovered or joined caribou herds. In addition to proliferation of wolves
which decimated the reindeer herds, elders reported that the loss of the herds was also due to disinterest in herding compared to hunting, trapping, fishing, and gathering. Most elders added that competition over diminishing reindeer herds as well as the introduced practice of charging people up to $20 a head to kill their own reindeer exacerbated the problem of dwindling herds. They believed that disagreements over natural resources to be morally inappropriate and eventually would lead to those resources taking themselves away from humans, such as Ellam Yua (“The Watcher of the Universe”) sending the wolves to take away the reindeer. Attempted management of natural resources has been thought to exhibit dangerous arrogance and presumption on the part of humans and could eventually result in loss of resources, according to Russian Mission elders.

In 1980-84, caribou hunting occurred from November through mid-April, with targeted hunting in December and February through March (Fig. 21). The latter time coincided in 1984 with the legal season in GMU 18, which was February 1 through March 31 (Alaska Board of Game 1985). Portions of game management subunits 22A and 21E were also within the hunting areas of Russian Mission residents (Fig. 25). However, the season for subunit 21E (August 10 through September 30) or the area where the lower portion of the Innoko River parallels the Yukon river, did not coincide with typical caribou hunting times of Russian Mission residents in that subunit. In addition, respondents noted that the legal season conflicted with moose hunting, and caribou were essentially inaccessible at that time, except by airplane, because they were usually in the uplands away from river corridors. Furthermore, the caribou season for GMU 22A, in the southern Norton Sound area, was open from July 1 through April 30 with a bag limit of five caribou per day. However, the area was not accessible until snow and ice allowed safe winter travel beginning in late November. As with moose hunting, caribou hunting in December was important for getting food for Slavic feasts in January.

Russian Mission residents looked for small caribou herds in the winter in certain pockets of the hills and mountains of the north side of the Yukon River. Kako Creek, Stuyahok, Bonasila, and Atchuelinguk rivers were important travel routes used when hunting caribou. The areas used for caribou hunting by residents of Russian Mission between 1980-84 included the headwaters and tributaries of the Atchuelinguk and Bonasila rivers, as well as the upper Andreafsky River and its East
Fork (Fig. 25). The latter area near Iprugalget Mountain or "Needle Mountain," as it is locally called, was also used for caribou and moose hunting by residents of Stebbins, St. Michael, and lower Yukon River communities downriver from Mountain Village (Wolfe and Pete 1984). Since the 1970s, between three to seven caribou hunting parties from Russian Mission, with some members from Marshall, have hunted almost annually in the area. Depending on travel and weather conditions, one to two trips were made per winter, usually before and after Slavic celebrations. As with hunters from other lower Yukon Yukon communities (Wolfe and Pete 1984), success was described as highly variable; hunters often returned with other resources, such as furbearers and small game.

Most caribou caught was shared widely and eaten fresh. It was rare for them to get enough to freeze or dry for later use.

**Bear**

Both black (*Ursus americanus*) and brown bear (*Ursus arctos*) were hunted by residents of Russian Mission in 1980-84. In Yup'ik, black bear were called *tang'gerlik*, derived from the word for the darkness. Terms for brown bear were *ungungsiq* meaning "land mammal or quadruped" or *caruyuk*, the same term used for "monsters or ghost" in the lower Yukon communities. Respondents reported that times and most areas used for hunting bear have remained relatively constant in their memory (Fig. 26). Annual times for hunting black bear were more extensive than for brown bear hunting, primarily because black bear were preferred for eating (Fig. 21).

Hunting of black bears was primarily after they have ventured from their dens in April and early May and could continue through the summer, especially if moose and caribou hunting was not very successful in the previous season (Fig. 21). Winter and spring hunting occasionally included checking dens if hunters knew their locations or taking them from dens after wood collectors or trappers accidentally disturbed them when collecting fallen timber or setting, checking, and furbearer snares and traps. Accidental den kills included brown bears. While prodding with ice picks or snow
poles to check for sets or to determine the depth of snow hunters sometimes accidentally disturbed bears in their dens and they subsequently had to be killed for protection of the hunters.

Intentional den hunting was done if location of dens was known and the meat was needed. Two or more hunters cooperated to dispatch the bear. Most hunters poked poles through the snow into the entrance of the den to determine the placement of the bear’s head and to clear a path for their rifles (Charnley 1984). Once the bear was killed, snow was cleared from the entrance and the limbs of the bear were tied together to pull it out of the den.

Fall hunting of bears occurred in conjunction with berry picking and moose hunting (Fig. 21). Hunters noted locations of dens by the grass piles or disturbed grassy areas where bears have pulled grass to fix their dens. Throughout early winter, hunters and trappers occasionally observed bears leaving their dens to forage for food. They were either hunted then or their dens were noted for future reference.

Proportionately more brown bears kills were in defense of life and property, especially in the late summer and fall, when they wandered near the community or fish camps. Both black and brown bears were hunted in late August until mid-September when their meat was considered tasty and fat from eating berries.

In 1984-85, there was no closed season for black bear hunting in the areas used by Russian Mission residents. There was a bag limit of three bears. The seasons for brown bear hunting in Russian Mission hunting areas that year were from September 10 through October 10 and April 10 through May 25 (Alaska Board of Game 1985) with a bag limit of one bear every four regulatory years. Most residents were very surprised to learn about the bag limit for brown bears, which they believed was designed for sport hunting. Russian Mission residents reported that even with only defense-of-life-and-property kills, the bag limit was inadequate for their needs.

Bears were considered to be powerful animals which humans had to show respect for and avoid offending. Although many complex and esoteric ritual prescriptions regarding treatment of bears have been discontinued, some practices did persist. While butchering a bear, its head was raised up on a log, to offer it a good resting place. Commonly, bear skulls were left or buried at kill sites (Charnley
1984). Some hunters report that the skull had to face the mountains or the east, where most of the mountains were. Taking the skull back to camp or the community exposed it to too many risks for offending the bear. Children could sit on the skull or dogs could gnaw on it. The state regulatory requirement to bring bear skulls for sealing (Alaska Board of Game 1984) was contrary to the local pattern, and local residents did not adhere to the regulation.

Although questions regarding the regulatory requirement to obtain a $25.00 brown bear tag prior to hunting were not asked directly, it appeared that Russian Mission hunters were, for the most part, ignorant of the regulation. The regulation was most likely viewed as a sport hunting, rather than a subsistence hunting regulation. According to managers, this perception of the brown bear tag fee regulation was shared with residents of other rural communities in western and northwestern Alaska (Loon and Georgette 1989). Records of tagged brown bears between 1981 and 1984 showed most were issued to non-residents and urban residents of Alaska (Alaska Department of Fish and Game 1987).

Well-established long-term and recent bear hunting areas included the Yukon River corridor from Ohogamiut up to the outlet of the Bonasila River; the lower reaches of the Bonasila River; and the Innoko River up to its confluence with the Shageluk River (Fig. 26). Hills bordering the north bank of the Yukon River, especially those accessible by going up Kako Creek and Tucker's Slough were also hunted, mostly in conjunction with furbearer trapping and wood collecting. Areas in the Yukon River delta proper and along the lower reaches of the Archuelinguk River were recent additions to the bear hunting area of Russian Mission residents. These areas represented hunting by those who established fish camps in the delta area or who had married people from communities in the area and went on hunting trips with their in-laws.

Bear were eaten fresh, frozen for later use, and partially dried and cooked or completely dried. Bear caught in spring, summer, and fall may was sometimes lightly smoked throughout the drying process. Most of the winter catch was shared throughout the community for variety from a fish diet. Hides were stretched to dry and used as rugs or mats when fishing through the ice. The fur was also used in handicraft articles for sale, such as vests, ruffs, and masks.
WATERFOWL HUNTING

Approximately 15 species of ducks which occurred in the Russian Mission use area were hunted by them between 1980-84. These species include northern pintail; mallard; green-winged teal; American wigeon; common goldeneye; northern shoveler; surf, black, and white-winged scoter; red-breasted merganser; greater scaup; red-necked grebe; and occasionally lesser scaup; and arctic, and red-throated loons. Other waterfowl species hunted by Russian Mission residents included tundra swan, Taverner's, lesser, and cackling Canada geese; snow geese; white-fronted geese; and sandhill crane. Other species, such as blue-winged teal; black brant; canvasback; and common and yellow-billed loons were very rarely caught.

Bird eggs, including those of gull (sp.), ptarmigan, plovers, sandpipers, and waterfowl, were collected in late May and early June (Fig. 21) whenever they were encountered while conducting other activities, such as wood collecting. All respondents reported that targeted egg collecting for many bird species as a separate activity has declined dramatically in the past decade.

Most waterfowl hunting by western Alaska residents, including Russian Mission, was not legal according the International Migratory Bird Treaty Act of 1916 because most hunting occurred in spring (particularly April and May) and late summer (mid-August to early October). The current season for most species begins September 1, which generally coincided with late staging time for southward migration. Throughout its existence, this prohibition was unknown by some people, thought by others to exclude Natives in rural areas, and ignored by a few who thought their exclusion in policy-making affecting them should not apply to them.

With observed declines in some waterfowl species, such as cackling Canada geese, which were included as a species targeted for special consideration in the Yukon-Kuskokwim Delta Goose Management Plan (YKDGMP) (U.S. Department of the Interior 1984, 1987), more widespread knowledge, if not understanding, of the cackling Canada goose harvest prohibition existed. However, prohibitions on some species, such as tundra swan were a mystery to local residents because of the local abundance of tundra swans on islands in the Yukon River in spring. Elders viewed the current
increased management and directed change efforts surrounding the four goose species (cackling Canada geese, black brant, white-fronted geese, and emperor geese) included in the YKDGMP with increasing concern. To many of them, its effects could be as deleterious as those which resulted from the controversy over diminished reindeer herds discussed above. That is, the birds could be taken away by the spiritual masters of the birds.

In the past, waterfowl hunting throughout spring, summer, and fall and occasional drives in the late summer was more targeted and utilized more extensive areas than those areas reported for 1980-84. With increased enforcement efforts prior to and around the time of Alaska statehood, these activities decreased and became more self-circumscribed (U.S. Department of the Interior 1962).

Most waterfowl hunting between 1980-84 was conducted in conjunction with other subsistence activities, such as bear and muskrat hunting or setting up fish camps in late spring (Fig. 21). Incidental waterfowl hunting occurred throughout the summer, again usually in conjunction with other activities, such as when drifting for salmon or checking set nets, rafting for logs or getting green willow or dead cottonwood for smoking fish. Side sloughs and lagoons enroute to drifting and set.net areas or wood collecting areas were scouted for waterfowl. In fall, waterfowl hunting was usually combined with berry picking, and bear and moose hunting. Hunting intensified somewhat when many species were molting (flightless) in mid-August. Some hunters reported that risks of enforcement of harvest prohibitions discouraged them during this traditionally important and productive waterfowl hunting time. Hunting drives of flightless birds with boats and nets in large lakes south of the community were essentially discontinued within the decade. Targeted waterfowl hunting in spring and fall and incidental hunting throughout the summer was done primarily by young men near the community or fish camps.

Since waterfowl hunting usually occurred with other activities, many of the areas used to hunt waterfowl were encompassed by the more extensive use areas for other species. The major areas used for waterfowl hunting between 1980-84 by Russian Mission residents included the Yukon River corridor from Nuugluaq upriver to the lower Innoko River area and middle Paimiut Slough region, coterminous with major moose and bear hunting areas. The Ohogamiut area and an area across from
a fish camp site near the Yukon River delta proper were also hunted for waterfowl in the early 1980s (Fig. 26).

Most waterfowl caught was widely shared and eaten fresh, with a few, usually tundra swan, dried or frozen. Waterfowl frozen for later use was usually prepared on special occasions such as holidays, birthdays, or people's "name days" -- commemorative days for the saint for which they were named in the Russian Orthodox religious calendar.

SMALL GAME HUNTING

Both willow and rock ptarmigan (*Lagopus lagopus* and *L. mutus*, respectively) were hunted extensively throughout the winter by residents of Russian Mission (Fig. 21). Most productive ptarmigan hunting occurred in late winter when daylight increased and the birds formed larger flocks intent on feeding on exposed tundra vegetation. Willow ptarmigan, the most abundant species, are called *aquesiq* or *qangqit*, terms used by Yukon River delta and coastal or lower Kuskokwim people, respectively. Rock ptarmigan were referred to as *etciyaat*. Spruce grouse (*Dendragapus canadensis*), or *egtuk* in Yup'ik, was another small game bird hunted primarily in the fall (Fig. 21).

Snowshoe hare (*Lepus americanus*), called "rabbits" in English and *maqanuaq* in Yup'ik, lexicalized from a literal translation meaning "pretend warmth," and arctic hare (*L. othus*), referred to as "jack rabbits," or *qayukeggliq*, meaning "one with good broth," were hunted and snared throughout the winter by residents of Russian Mission (Fig. 21). Snowshoe hare were caught in greater numbers than arctic hare.

Ptarmigan, grouse, and hare were all sought while also hunting and trapping for other species. Most targeted hunting or snaring of these species was done by women and young men and boys in areas relatively close to the community (Figs. 27 and 28).

There were huge hare drives in early winter either just prior to freeze-up when boat travel was still possible or as soon as ice thickness allowed snowmachine travel and before the hares dispersed from islands or productive willow copses along the Yukon River. Many people cooperated in these
drives and shared the catch (Charnley 1984). Groups of 5 to 10 people drove hares beginning at one end of an island or copse of willows to the other where the collection of hares were shot with .22 rifles. The most consistently productive islands or areas for hares drives in 1980-84 were Devil's Elbow and Blade islands near Ohogamiut; the lower end of Ickes Slough, Roosevelt and Grand islands near Nuugluaq; Flora Island near Portage Slough; Circle Island near Russian Mission; Arctic Island, across from the outlet of Kako Creek; an area across from Dogfish Village, and Pearl and Base islands east of the mouth of Tucker's Slough (Fig. 28).

Porcupine (*Erethizon dorsatum*) or *issaluq* in Yup'ik, were considered "emergency food," because they were relatively easy to dispatch any time of year (Fig. 21) (Charnley 1984). They were killed either by clubbing or shot only when food supplies at camps got low or when they became a nuisance by harassing or harming dogs or people at camps or in the community. Some women heard from their relatives downriver, which they themselves had yet to try, of a method for "harvesting" porcupine quills without killing the animal. A wool sweater or burlap bag was thrown over the porcupine forcing it to drive its quills into the sweater or bag. The quill infested cloth was jerked off of the animal and the quills were pulled out for use in home-made crafts which were sold for cash. Porcupine grew more quills to replace those "harvested."

All small game were usually eaten fresh. Only ptarmigan were reported to be harvested in large enough numbers to allow a surplus to be freeze-dried for later use.

**HUNTING AND TRAPPING FURBEARERS**

Nine species of furbearers were hunted, trapped, and snared by Russian Mission residents between 1980-84 (Fig. 21). The following listing of the nine furbearer species includes the Yup'ik terms applied to them by Russian Mission residents. The species hunted and trapped were beaver (*Castor canadensis*; *pulluqaq*); land otter (*Lutra canadensis*; *cutquipuq*); lynx (*Lynx canadensis*; *ternui*); marten (*Martes americana*; *qavcicuaq*, meaning "little wolverine"); mink (*Mustela vison*; *imarmiutaq*);
muskrat (Ondatra zibethica; kanaqlak); red fox (Vulpes vulpes; kaviaq); wolf (Canis lupus; kgluneq); and wolverine (Gulo gulo; qavcik or terikaniaq in Yup'ik).

Furbearer hunting and trapping involved the most extensive use of land in that time period, incorporating game management units 18, 19A, and 21E (Fig. 28). Many respondents stated that when dog teams were the predominant means of winter travel and fur prices were higher, fur trapping involved areas even further away than those used in 1980-84 (Charnley 1984). Namely, the areas extended further up into the Paimiut Slough drainage and Portage Mountains and further north into the Bonasila and upper Atchuelinguk drainages.

Furbearer populations and extent are known to fluctuate over time, such as the well-documented relationship between lynx and snowshoe hare population cycles and territory. According to Russian Mission respondents, all furbearer species they harvested have exhibited some changes in numbers or territory, or both, at least in their memory. For example, when most elders interviewed were young, they reported their elders active in trapping and hunting beaver in the mid-1800s when beaver populations were as prolific as they are becoming now throughout the region. Beaver lodges were numerous and seen in unlikely places, causing concern about freshwater fish stocks, as they were in the 1980s. However, some residents believed the increase in beaver numbers in the mid-1800s and the effects on the environment functioned as "habitat building" for moose migrations from the upriver regions of the Yukon River drainage which began in the early part of this century. As alluded to before, wolf were more numerous in the region when caribou and reindeer herds existed. The other remaining furbearer species, also exhibited smaller, but still noticeable changes in population size and extent during the last several decades.

Winters in the early 1980s were not conducive to productive furbearer trapping. Several residents were noted to invest considerable time and effort in trapping furbearers prior to the 1980s. Currently low prices of pelts affected their activities as well. Families tended to trap in areas they regularly used, but people said the area was open. Although organized traplines did not exist, it was reported that more attention was paid to where traps were set and by whom particularly in areas that were known to produce more marten.
Various furbearer species were noted to concentrate in particular areas within the Russian Mission use area. For example, muskrat, mink and land otter were more abundant in the Portage Slough area as well as the marsh area across and downriver from Ohogamiut, whereas lynx, marten and wolf were most often caught in the forested and areas of higher elevation to the north and east of the community (Fig. 28). Red fox, wolverine, and beaver currently were relatively well-dispersed throughout the area.

Most trapping and snaring during the study year by Russian Mission residents was conducted within the established legal seasons, especially with the recently extended beaver seasons and bag limits in Game Management Unit 18 (Alaska Board of Game 1984). Furbearer trapping began as soon as it was safe for winter travel, usually between mid- to late-November (Fig. 21). Late winters were common in recent years, which contributed to reported poor success rates among Russian Mission trappers. Most targeted trapping began in earnest in December when fur quality improves and most streams freeze solidly. Trapping continued until late April or early May, depending on travel conditions.

Local harvesting patterns of some furbearer species exceeded the season closure. Some years, winter travel conditions influenced harvest timing; a late winter usually resulted in a later furbearer trapping and hunting season. Beaver, muskrat, and land otter were sought sometimes even after river ice breakup because their fur was considered to maintain its quality until early June, when the amount of daylight was finally at its peak (Fig. 21). Mink and land otter were incidentally caught in traps set for blackfish, although those traps, called *taluyat*, were also used for mink and land otter.

Although all species were both hunted and trapped, hunting in generally was more opportunistic. However, targeted muskrat hunts in the spring occurred in the area across from Ohogamiut, at which time occasional beaver and land otter were also shot. Hunting, particularly of red fox, occurred when animals were encountered while checking traps or snares or hunting moose, caribou, bear or small game. In 1984, there was no legal hunting season for beaver, marten, mink, muskrat, and land otter within the state (Alaska Board of Game 1985).
Russian Mission residents both processed furs for home use and for sale. Fur products were also made to sell. In addition to this use, beaver, mink, and muskrat meat were eaten. A few trappers who took many beaver fed carcasses to their dogs or sold them to other mushers both within and outside the community, including dog team racers living in Bethel.

GATHERING

In 1980-84, Russian Mission residents conducted most gathering activities in the summer, except for wood collecting, which was carried out year-round. However, efforts were concentrated in months of open water (Fig. 21). There were some plants and plant materials listed by Russian Mission residents which were typically gathered in winter, such as grass for boot soles, birch bark usually for containers, and willow bark for dying tanned hides. Birch and willow bark had not been regularly harvested by those we interviewed in the time period covered.

The most commonly gathered plants were berries. The general term for berries in Yup’ik is atsaq (singular; atsat, plural). Russian Mission residents picked cloudberries (Rubus chamaemorus), locally called “salmonberries,” in English and atsapik, meaning “real berry” in Yup’ik; blueberries (Vaccinium uliginosum), called curaq; crowberries (Emmerum nigrum hermaphroditum), referred to as “blackberries,” or tan’gerpak, meaning “big dark (thing)”; lingonberries or lowbush cranberries (Vaccinium vitis-idaea minus), usually called “red berries” or “cranberries” in English and tumaglik in Yup’ik; highbush cranberries (Viburnum edule), “cranberries” or klingik; and two species of raspberries (Rubus idaeus and R. arcticus sp.), which were both called puyunuaq in Yup’ik.

Some families established camps for berry picking when salmonberries were ripe. Other species were also picked if they were found, however, most were harvested on day trips from the community. They ripen later than salmonberries, usually when families were moving fish and equipment from fish camps and preparing for moose hunting. Fish camps and moose hunting camps were also used as a base for berry picking if berries were plentiful nearby. Most raspberries were picked around the community.
Berry picking between 1980-84 by Russian Mission residents occurred in the lower reaches of Paimiut Slough; an area around the old Paimiut village site; the Portage Lakes region; hills along the Yukon River above and downriver from the community; an area upriver from Ingirrarniut; around the community of Marshall; an area immediately upriver from the mouth of Reindeer River; across from the community of Pilot Station; along the slough to and near Partway Lake; near the community of St. Mary's; and two areas downriver from the community of Mountain Village (Fig. 27). Berry picking in some of the areas near other communities was a result of invitations from relatives in those communities or former residents of those communities returning for berry picking.

Berries were commonly used as an ingredient in akutaq, known as "Eskimo ice cream," made into jams and jellies, used in cake decorating (usually only raspberries), and baking. Akutaq was an especially important food to offer guests during Slavic, or Russian Christmas.

Rose hips were gathered in the fall from around the community or at fishing and moose hunting camps. They were primarily mixed with berries in jams and jellies. Some people dried them to make tea, at times mixing them with commercially manufactured black tea.

Most residents reported gathering fresh plants for food between 1980-84. These plants included sourdock (*Rumex arcticus*) or quageiq, which was cooked and mixed with sugar or with berries in akutaq; wild celery (*Angelica ludica*) or ikiituk, whose outer skin was peeled and the core eaten fresh; fireweed shoots (*Epilobium angustifolium*) or essalaungsat, which were also eaten fresh; willow shoots (*Salix sp.*), called cuyaq, eaten fresh as well; and Labrador tea (*Ledum sp.*) or ayuq, which was mixed with black tea and also harvested in the winter from areas drifted clear of snow.

Grass was gathered for mukluk insoles, as well as to spread around dog yards for dogs to lay on. Wormwood (*Artemisia sp.*), called caiggluk, is an important medicinal plant used for a variety of ailments. It is used as a hot pack for arthritis or sore muscles during steam baths or brewed into a strong tea and drunk for upper respiratory or digestive ailments.

As mentioned above, wood collecting occurred throughout the year, although most of the effort was during months of open water (Fig. 21). Intercepting and collecting driftwood immediately after river ice breakup rids the water of wood that would potentially be tangled up in nets. Much of the
wood gathered at this time was used at fish camps for heat; steambaths; smoking fish; repairing smokehouses, tent frames, cabins, fish processing facilities, such as cutting tables, drying and net racks; and making docks to which boats were tied. Wood was collected throughout the summer and stockpiled for use in winter, especially after salmon fishing was done and the processed fish were in the smokehouse.

Most winter wood gathering started after snowmachine travel was possible. Some people hauled back fallen timber or cut timber that was piled up near their fish camps throughout the summer. Incidental to wood and plant collecting was gathering of birch and willow fungus or qasnuq, which was made into a commodity of considerable importance to a few families' incomes. The fungus could be sold by the pound; most commonly the fungus was burned and the ashes, called araq, were sold to be mixed with tobacco leaves and chewed.

SEA MAMMAL PRODUCTS

Russian Mission residents regularly traded or bartered with residents of or relatives in delta or coastal communities for sea mammal products, such as seal meat, oil and skins, and belukha and walrus skin. Russian Mission residents sought after and obtained seal oil in the largest volume, compared to other products. Moose meat, eels, dried salmon, and money were commonly given in exchange for those products. Salmon products were most sought after by families in Scammon Bay and Hooper Bay. Russian Mission families, primarily those who conducted subsistence and commercial fishing activities in the Yukon River delta area, sometimes hunted and caught their own sea mammals and brought them back to Russian Mission for their own use and to share with relatives. With shorter and more circumscribed commercial fishing times, this practice was not as common as it used to be. Local residents said they had made plans in recent years to hunt seals with friends and relatives downriver, but for various reasons, these plans have not been realized.

Trade and barter for sea mammal products in the early 1980s was not as widespread as it used to be, according to elders. In the past decade, many families obtained most sea mammal products,
primarily seal oil, from relatives and friends who had come upriver from delta and coastal communities to hunt moose in the fall and winter. Often, nothing was given in return, except a place to stay, as the givers generally refused offers of salmon or other products. There seemed to be a tacit understanding that these gifts generated permission to hunt moose in the area, although this speculation needs more in-depth research.
CHAPTER 6
SUMMARY AND DISCUSSION

This study documented information on current land use, annual seasonal subsistence activities, salmon and moose harvests, current wage employment opportunities, and briefly examined the historical and contemporary community context of some of these economic activities, in the community of Russian Mission. A census of species harvested and information on their uses was collected. A more in-depth examination of the uses and importance of salmon and moose was conducted to address some regional concerns about these resources.

In 1984, Russian Mission had 236 people in 49 households. Most permanent residents (94 percent) were Yup'ik Eskimo, and the population was comprised of predominantly young people. The community grew around a Russian trading post established in 1836, and a Russian Orthodox church, first built there in 1851. The 1984 population of Russian Mission represented a culmination of successive relocations of residents of settlements in the area from Paimiut downriver to Ingrirramniut along the Yukon River. These movements, which began in the early 1800s in response to population decimation due to disease, continued through the 1960s. Later population shifts resulted from the imposed requirement to provide children with an opportunity for education and for more immediate access to church and stores. Since the 1970s, population increase in the community has been primarily through natural growth, evidenced by its young population.

Traditional trading relationships with other Native groups prior to sustained non-Native contact influenced the economy of the Russian Mission area. Russian Mission was situated along important traditional trade and travel routes, namely it is along the Yukon River and near portage areas to the Kuskokwim River. Opportunities for wage employment and trade have shifted through time. However, they have always been based on an aspect of locally available fish and wildlife resources. Residents of the region have been engaged in producing wood for steamships; drying
salmon to trade with mail carriers and placer miners; adjusted effort in trapping furbearers with fluctuations in the fur market; and became involved in commercial salmon fishing and processing.

The economy of Russian Mission in the 1980s was typical of many other rural Alaska communities. However, its median income has been noted as among the lowest in the state in the late 1970s. Cost of living was usually about two times the national average, so monetary expenditures provided less return. Most jobs were seasonal and available primarily through government-sponsored projects and services, such as the schools, municipal services, health corporation, resource management agencies, and construction of government facilities. Only a few private sector jobs, such as those made possible through village corporations, private stores, and seasonal fish tendering and processing, were available. In 1984, there were 78 positions held by 65 residents. Most positions were seasonal and paid less than $15 per hour. Many households combined several types of wage employment or self-employment, such as commercial fishing and seasonal construction work. Only two percent of all households reported no income from commercial fishing or some form of wage employment; they relied primarily on transfer payments as their major source of money. There were 17 commercial salmon permit holders who employed family members as helpers; all the permit holders sold salmon in the study year.

Salmon were considered the most important resource to residents of Russian Mission. Production of salmon for family use and commercial sale by Russian Mission residents was a prime example of the integration of the subsistence and market sectors of the economy. There was high involvement in subsistence salmon fishing. All households with commercial salmon permit holders also participated in the subsistence fishery and both used the same equipment. Fish camps served as bases for both types of fishing; in some cases commercial fishing dictated the choice of the fish camp site. Salmon production units included extended families, often from multiple households, with adult offspring to provide labor. All three-generation (extended family) households in the community were involved in subsistence salmon fishing. Thus, households involved in subsistence salmon production, on the average, were larger in size than those not involved, and had older households heads. Most newly established households, as well as those with elderly people did not participate in salmon fishing.
King salmon were the most important species for subsistence followed by summer chum salmon. The location of the community and the size of the salmon runs when they reached the area provided unique advantages for subsistence salmon fishing with minimal inconvenience from regulatory restrictions aimed at the commercial salmon fishery. Good fish camps sites as well as consistently productive fishing areas were documented. Fishing families were able to harvest most king salmon and summer chum for subsistence prior to the start of the commercial fishery. However, Russian Mission residents would like to enjoy more local benefit from the commercial salmon fishery, particularly by acquiring more limited entry commercial salmon permits.

Compared to salmon, moose were relatively recent arrivals into the area. Moose populations were believed to have increased rapidly because the area surrounding Russian Mission hosted a convergence of moose populations moving down both the Yukon and Kuskokwim River drainages earlier in this century. The movement was thought to be in response to several factors, including human population increases upriver, plenty of good browse areas after extensive forest fires and beaver proliferation, and relatively mild winters with excellent calf production. The firm incorporation of moose hunting and use into the subsistence pattern practiced by Russian Mission residents in 1984 was evidence of the adaptability of subsistence economies. Moose hunting was important as a separate activity as well as in combination with other subsistence pursuits within the land use area of the community. Participation in moose hunting was significant and widespread sharing added to its impact on the community. The use of moose meat in Russian Orthodox Christmas (Slavic) celebrations was especially important.

In 1984, regulatory seasons within the game management units encompassing areas used by residents of Russian Mission for moose hunting accommodated most of the times they hunted moose. Regulatory actions by the Alaska Board of Game, such as creation of controlled use areas, addressed some local concerns about competition from moose hunters outside of the area. Bag limits for moose were problematic for a few hunters who were consistently productive and expected to share their moose catches throughout the year.
Regulatory seasons for caribou and the bag limit for brown bear were inadequate, according to local respondents, for established hunting patterns in 1984. Although caribou seasons were generally concurrent with local patterns within most of the game management units used by local residents, the caribou season in GMU 21E, an important hunting area, was not. The GMU 21E season was from August 10 through September 30. Russian Mission residents traditionally hunted caribou in that area in the winter. The brown bear sport hunting bag limit of one bear per hunter every four regulatory years was entirely deficient. Kills just for defense-of-life-and-property were thought to occur more often than that. Requirements to tag bear hides and skulls ran counter to local cultural practices to show respect for bears.

Other changes in species abundance and distribution have required adjustments on the part of Russian Mission residents, such as moose being integrated into the subsistence economy. Caribou and reindeer populations have decreased drastically. Beaver populations have fluctuated between wide regional proliferation to few animals in selected areas.

The contribution from subsistence activities other than salmon fishing and moose hunting into the economy was significant. Sheefish, pike, burbot, whitefish, cisco, blackfish, grayling, Dolly Varden, and Arctic lamprey were fished. Caribou, black and brown bear, over 20 species of migratory waterfowl, as well as small game animals such as hare, porcupine, ptarmigan, and spruce grouse were hunted. Furbearers, including muskrat, beaver, lynx, red fox, wolf, wolverine, mink, land otter, and marten were trapped and hunted. A variety of berries and plants were gathered and both driftwood and timber were collected for a variety of uses. Products from subsistence harvests, such as pelts or items made from furs, beaver carcasses, and Arctic lamprey were sold or traded in regional networks. Sea mammal products, primarily sea oil, were acquired from relatives or friends in communities in the Yukon River delta area.

The seasonal round reflected the importance of fish, both in terms of when fishing occurs, which was year-round, and for the number of fish species that were harvested. Residents of Russian Mission had access to major migratory species, such as salmon, sheefish, and Arctic lamprey. They also fished resident stocks of whitefish, pike, burbot, and blackfish.
Former residents of settlements that were abandoned upon relocation to Russian Mission tended to focus subsistence activities around their former settlements. However, with these moves, each community's resource use area has been incorporated and has added to the current areas used by Russian Mission residents in 1980-84. Areas used by former residents of Ohogamiut and Paimiut were generally well-represented within the approximately 6,500 square miles of subsistence use area documented in this study.

The areas Russian Mission residents used in 1980-84 for subsistence hunting, fishing, trapping, and gathering were both within and extended beyond the boundaries of the BLM's Anvik/Bonasila/Unalakleet Planning Block (Figs. 1 and 20). Residents of the community informed BLM of these uses within the planning block at a public meeting in October 1985. Some allowable uses could potentially conflict with existing subsistence activities, such as mineral leasing and settlement entry, and local residents expressed concern about these issues. As of November 1985, the environmental assessment of the planning block, which was to occur prior to the draft plan, was postponed due to budget cuts (U.S. Department of the Interior 1985).

In summary, Russian Mission was similar to other rural communities in western Alaska in that it has combined subsistence and market activities, as well as relatively scarce, and sporadically available wage employment in its economy (Wolfe et al. 1984). The wage employment sector appeared to be relatively unstable. Technology and methods of fishing, hunting, trapping, and gathering were well adapted to local conditions. Family strategies often incorporated members of more than one household, such as in subsistence and commercial salmon production. Many local resources, such as timber, fish and animal species, were harvested and some of their individual contributions and importance have fluctuated through time depending on availability, abundance, and market demands.
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United States Department of Commerce

United States Department of the Interior


Zagoskin, Lavrentiy

APPENDIX 1. RUSSIAN MISSION SUBSISTENCE SALMON FISHERY, DIVISION OF SUBSISTENCE SURVEY, SUMMER 1984

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Harvest</th>
<th>Method of Processing</th>
<th>Net Length</th>
<th>Mesh Size</th>
</tr>
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<tbody>
<tr>
<td>Total</td>
<td># dried</td>
<td># strips</td>
<td># salted</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Kings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer chum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall chum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silvers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Humpies&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When did you fish for subsistence?

- [ ] only before commercial fishing started
- [ ] before and after commercial fishing started.

Who helped in fishing?

**Name(s)**

Harvesting:

- Own HH/different HH
- Relationship to Fishcamp HH head

Cutting:

To whom did you give salmon?

**Names(s)**

Relationship to Fishcamp HH head
APPENDIX 2. RUSSIAN MISSION MOOSE HARVESTING SURVEY, DIVISION OF SURVIVAL, 1984

Interviewee: __________________________
For all Russian Mission residents who hunted moose during the September 1 to September 31, 1984 season or in the fall of 1984 in Unit 18.

How many days did you spend moose hunting? _______

Where did you camp? (See map.)

How much did moose hunting cost you in terms of gas and food? _______
Note: The distance they travelled may help in figuring this out.

Who was in the hunting party? __________________________  Own HH / Dif. HH

What did you do with the moose you caught; how much of the moose was shared dried frozen canned

If shared, how many different households got some of the moose you caught?
### APPENDIX 3. CONVERSION FACTORS FOR USABLE WEIGHT OF SALMON

<table>
<thead>
<tr>
<th>Species</th>
<th>Average round weight in pounds&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Conversion factor&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Usable weight in pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>King salmon</td>
<td>22.0</td>
<td>0.8</td>
<td>17.6</td>
</tr>
<tr>
<td>Summer chum salmon</td>
<td>6.9</td>
<td>0.8</td>
<td>5.5</td>
</tr>
<tr>
<td>Fall chum</td>
<td>7.5</td>
<td>0.8</td>
<td>6.1</td>
</tr>
<tr>
<td>Coho salmon</td>
<td>7.0</td>
<td>0.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Pink salmon</td>
<td>3.2</td>
<td>1.0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.2</td>
</tr>
</tbody>
</table>

<sup>a</sup>Round weights for each species were derived by averaging average weights reported for commercially caught salmon (Alaska Department of Fish and Game 1961-84).

<sup>b</sup>Conversion factors were calculated by estimating the weight of salmon parts typically used for human consumption, in this case, approximately 80 percent of salmon by weight was utilized for food by residents of Russian Mission in 1984.

<sup>c</sup>Most (99.6 percent) of the pink salmon harvest was fed in the round to dogs, which is why a conversion factor of 100 percent is used.