HISTORICAL AND CONTEMPORARY FISHING
FOR SALMON AND EULACHON AT KLUKWAN:
AN INTERIM REPORT

by
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This report provides a preliminary description of past and present fishing activities by the residents of Klukwan, a community of 135 people on the Chilkat River in northern Southeast Alaska. During the summer of 1982, information on fishing in Klukwan was gathered by means of interviews and participant observation during three, one-week visits to the community. The report summarizes initial fishing information gathered and represents the first part of a longer term study on resource use patterns in the area.

The village of Klukwan is located in an area between two geographic zones, maritime and subarctic interior, which for centuries has provided its residents access to an abundant variety of resources. There are few opportunities for local wage employment in Klukwan; only limited part-time employment is available in public services in the village and commercial drift gill net fishing in Lynn Canal. The economy is based on a combination of cash earning and harvesting local fish and wildlife resources for domestic use. Salmon from the Chilkat River is the staple food item for most residents; eulachon, harvested in spring, is also an important source of food and oil.

Historically and contemporarily, sockeye has been the most frequently harvested salmon in the Klukwan area. Sockeye is highly desirable because of its dependable runs, abundance, and suitability for preserving. King salmon, chum salmon, and coho salmon are also widely used today as fresh and preserved fish as they were historically.

Methods of harvesting salmon have changed since Alaska's statehood in
Historic methods of fishing in the area included the use of set gill nets, but more commonly residents used a gaff hook attached to a 10 to 15 foot wooden pole for taking salmon. Present techniques for harvesting salmon include set gill net and rod and reel, which has been substituted for the gaff hook as a selective fishing tool. Regulations on allowable gear type since state management came to the area, appear to have played a major role in shaping present harvesting techniques. Also, materials available for durable gill nets became easier to obtain and less costly.

Traditional methods of preparing and preserving salmon, such as smoking and drying, are common today. Large quantities of salmon are smoked, dried, canned, or frozen for use throughout the year.
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INTRODUCTION

At its January 1982 meeting, the Alaska Board of Fisheries raised questions regarding resource use activities in the Chilkat River Valley by the community of Klukwan. In April 1982, community leaders of Klukwan expressed concerns to the Department of Fish and Game about the adequacy of information available to the Board at its regulatory meetings and about the public's lack of understanding of the traditional practices of the village of Klukwan. Village leaders requested the formation of a Fish and Game Advisory Committee for Klukwan since they felt their interests were not being represented by the present area advisory committee. These local representatives urged the Department to document historic and contemporary land and resource uses by their community. In June 1982, the Division of Subsistence began collecting information on local resource gathering activities for inclusion in management plans and consideration in regulatory processes.

Purpose

The purpose of this report is to provide a preliminary description of local fishing activities by the residents of Klukwan. This information represents the first part of a longer term study on resource use patterns in the area. The report describes past and present patterns of local fishing by residents of Klukwan. The information summarized in this report should be considered preliminary. Analysis of resource uses and patterns will become more complete as additional information is collected.
methodology

During the summer of 1982, information on fishing at Klukwan was gathered by means of interviews and participant observation during three, one-week visits to the community. There were 32 subsistence salmon fishing permits issued to Klukwan residents in 1982. Informal interviews which focused on summer fishing activities were conducted with 10 households who were permit holders, representing approximately 25 percent of the households in Klukwan. Twelve individuals who were fishing on the Chilkat River near the village of Klukwan were visited on-site to observe and participate in fishing activities. Interview sessions varied in length and format, depending on the interviewee's interest and available time, and were conducted during three visits to the area in July, August, and September. Discussion focused on historical and contemporary patterns of fishing, seasons, strategies of harvesting, and means of processing salmon.

Information presented in this report is taken from interviews with local residents unless other sources are cited. The historical section depicts fishing patterns that are known to have existed between 1910 and 1959, when the State assumed management of fish and game resources. The contemporary section describes activities prevalent in 1982. Most of this section concentrates on patterns observed in the summer of 1982. The past tense is used when describing these contemporary activities and should be understood as referring to practices during 1982, unless otherwise stated.

BACKGROUND

In the late nineteenth century, there were three permanent villages of
the Chilkat Tlingit along the north bank of the Chilkat River: Yindastki, Katkwaltu, and Klukwan. Klukwan (*Tla'kwaan* -- "Eternal Village") was noted as being the largest and wealthiest village of the Upper Lynn Canal area (Krause 1956 [original 1885]).

Klukwan is located approximately 20 miles upstream from the mouth of the Chilkat River and the contemporary community of Haines (Figures 1 and 2). In the nineteenth century, Klukwan was the residence of the *Gaanaxtedidi* clan of the Raven phratry, and the *Kaa'gwaantaan*, *Dagisdinaa*, and *Dakl'aweidi* clans of the Eagle phratry (Swanton 1916). Today, it is the only remaining Chilkat Tlingit village.

Klukwan is located in an area of transition between two geographic zones, maritime and subarctic interior (Figure 1). Twenty-two miles southeast of the village lie the upper reaches of Lynn Canal, where a mild and moist maritime climate supports a western hemlock-Sitka spruce forest ecosystem. Twenty miles to the north are the Canadian border and mountain passes which open to the dry subarctic interior region. Throughout these areas glaciers scoured deep U-shaped river valleys and long narrow fjords. The location of Klukwan has provided its people with an abundant variety of resources from which to live.

In 1861, it was estimated that the communities in the area had a total of 1,616 people, the largest population of the 14 areas surveyed in Southeast Alaska (Petroff 1884). A drastic population decline in the Klukwan area near the end of the 19th century was believed to be caused by a smallpox outbreak. In addition, some Klukwan residents migrated to Haines when salmon canneries opened during this same period. Population totals since 1910 are depicted in Table 1.
Fig. 2. The Chilkat River Valley (Haines to Klukwan)
TABLE 1
POPULATION TOTALS, KLUKWAN 1910-1980

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td>245</td>
</tr>
<tr>
<td>1920</td>
<td>167</td>
</tr>
<tr>
<td>1930</td>
<td>97</td>
</tr>
<tr>
<td>1939</td>
<td>97</td>
</tr>
<tr>
<td>1950</td>
<td>91</td>
</tr>
<tr>
<td>1960</td>
<td>112</td>
</tr>
<tr>
<td>1970</td>
<td>103</td>
</tr>
<tr>
<td>1980</td>
<td>135</td>
</tr>
</tbody>
</table>

(U.S. Department of Commerce, Bureau of the Census, 1982)

In 1980 Klukwan had a population of 135, 85.9 percent of which were Alaska Native (Table 2). Forty households, averaging 3.4 people per household, were present in Klukwan in 1980 (Table 2).

TABLE 2
KLUKWAN POPULATION PROFILE 1980

<table>
<thead>
<tr>
<th>Number of people</th>
<th>Number per age group</th>
<th>Number per ethnic group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male - 71</td>
<td>Under 5 years - 23</td>
<td>Alaska Native - 116</td>
</tr>
<tr>
<td>Female - 64</td>
<td>5 - 17</td>
<td>Non-Native - 19</td>
</tr>
<tr>
<td>Total - 135</td>
<td>18 - 64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65 and over - 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Median age - 24.9</td>
<td></td>
</tr>
</tbody>
</table>

(U.S. Department of Commerce, Bureau of the Census, 1982)

There were few opportunities for local wage employment in Klukwan in 1982. Only limited part-time employment was available in government services in the village such as schools, public utilities, the village corporation, and tribal government. Many of these services had been federally
funded and are being reduced by federal budget cuts. Only a few Klukwan residents have found employment in Haines, 22 miles down river. Five households were known to participate in the commercial drift gill net fishery in Lynn Canal. Table 3 summarizes Klukwan household income levels in 1979. According to the 1980 U.S. Census 58 percent of Klukwan households had incomes of $7,500 or less.

<table>
<thead>
<tr>
<th>Income</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below $2,500</td>
<td>15</td>
<td>39.5</td>
</tr>
<tr>
<td>$2,500 - $7,500</td>
<td>7</td>
<td>18.4</td>
</tr>
<tr>
<td>$7,500 - $25,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$25,000 - $27,000</td>
<td>4</td>
<td>10.5</td>
</tr>
<tr>
<td>$27,000 - $35,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$35,000 - $40,000</td>
<td>9</td>
<td>23.7</td>
</tr>
<tr>
<td>$40,000 - $50,000</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>Over $50,000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3
HOUSEHOLD INCOME IN KLUKWAN, 1979
(n=38)

Fishing, hunting, and gathering local resources continued to be important economic activities for Klukwan residents in 1982. Resources utilized include a wide variety of fish; game such as moose, bear, mountain goat, and seal; plants; furbearers; waterfowl; berries; and wood products.
FISHING PATTERNS

The following section describes the historical and contemporary eulachon and salmon fisheries in Klukwan. Information is summarized from interviews with longtime residents and several published sources. Beginning with the eulachon fishery and the focusing on salmon, the section describes various components of historic fishing patterns from 1910 to 1959 and more contemporary fishing patterns in 1982. Salmon fishing is divided into three subsections -- "fishing," "technology," and "preparation and preservation," with historical and contemporary practices presented within each subsection for purposes of comparison and contrast.

Historical Eulachon Fishing

Beginning in the spring, Klukwan residents established camps between 4 and 9 miles upstream from the mouth of the Chilkat River for taking eulachon (Figure 2). Annually between mid and late May, eulachon (Thaleichthys pacificus) travel upstream from the ocean in substantial numbers. Large dip nets on the end of a pole were drawn through the water or held in the current by an individual standing on the shore or in a small boat near the shoreline. When the eulachon run reached its peak, good fishing would last one or occasionally as long as two weeks. Large quantities of fish were taken both for preserving whole and for rendering oil, which was highly valued. A three man canoe filled with eulachon would yield between five and six gallons of oil. Numerous canoe loads were harvested by each fisherman (Stewart 1977). Generally men conducted the fishing activities but the entire family was involved in preparation and processing activities.

Rendering eulachon oil was usually a group project, sometimes involving
a number of families and considerable time and effort. A large pit was
dug in the ground, filled with eulachon, and covered with wood. The eulachon
were then left to "ripen" in the pit for ten days to three weeks, depending
on the ambient temperature. After ripening, the fish were put into large
wooden boxes or barrels full of water, and boiled and stirred for several
hours until the oil was released from the fish and the solids sank to the
bottom. After standing, the oil rose to the top and was skimmed and sealed
in a container. The eulachon oil, often called grease, was eaten with most
foods and used for preserving berries, roots, and herbs. It was consumed
in large quantities at feasts (Oberg 1973).

The 1982 Eulachon Fishery

In 1982, fishing in the Klukwan area began in mid-May with the start of
the eulachon run. Because these fish spawn close to tidally influenced
water, families drove down the Haines Highway from Klukwan (mile 22) to
sites 4 to 9 miles north of Haines on the Chilkat River, where eulachon are
known to congregate in large numbers. Throughout this area are numerous
sites where past and present fish camps of people from the Klukwan and
Haines areas are evident. Many residents from the Haines area also were
active in the eulachon fishery, which lasts one to two weeks.

Dip nets were used to scoop the fish from the water and into dug pits
lined with plastic or with large wooden boxes, where they were allowed to
age for one to two weeks. The aged fish were then placed into metal barrels
where they were boiled and allowed to settle. The oil was then skimmed off
the surface of the barrel contents. Several Klukwan households reported
that they rendered about nine gallons of oil each in 1982. Eulachon were
also smoked, dried, and prepared fresh by frying whole until crisp.

The run of eulachon on the Chilkat River in 1982 reportedly was not as strong as in previous years. Some residents thought the fish may have been spawning on the south side of the river instead of the northside close to the road, where most people dipped. At the head of Lutak Inlet near the mouth of the Chilkoot River, where some Haines residents traditionally have fished, there was an abundant run of eulachon in 1982. Haines and Klukwan residents who were unable to catch the desired quantities of eulachon from the Chilkat River drove to the Chilkoot River to fish.

Historical Salmon Fishing -- General Patterns

There are unique environmental factors in the Klukwan area which affect salmon fishing. The village is located adjacent to the Tsirku River outwash where warm waters upwelling on the alluvial fan prevent portions of the Chilkat River from freezing, except during long cold spells in midwinter. This hydrologic anomaly provides a special habitat for spawning salmon, and a good source of fresh fish for humans during the late fall and winter months.

King salmon fishing occurred after eulachon fishing in the historical annual round of resource uses. Families would remain at their eulachon fishcamps and fish for king salmon in nearby streams from late May to June (Goldschmidt and Haas 1946). As is described in a later section on historic technology, king salmon were caught with a gaff and pole, usually near their spawning grounds in the clear tributaries of the Chilkat River. King salmon were the first fresh fish available in the river after the eulachon, and were desired for immediate consumption as well as for smoking. Big
Boulder Creek, located northwest of the village of Klukwan, was also known as a good location for king salmon fishing (Figure 1).

The first run of sockeye salmon up the Chilkat River adjacent to the village of Klukwan usually began in early June and occasionally as early as mid-May. After king salmon fishing, people would move back to Klukwan for sockeye and chum salmon fishing. Most of the early sockeye spawn in the Chilkat Lake system. These fish, upon reaching the area of Klukwan, traveled south up the Tsirku River outwash through small sloughs into Chilkat Lake (Figure 2). The men of Klukwan fished these areas for sockeye salmon, using pole-and-gaff and spear methods. The sockeye fishing season continued through the summer months, usually peaking in mid-July to early August. Sockeye salmon were traditionally considered a desirable fish for preserving in quantity, because their relatively firm, dry meat made them suitable for smoking, drying, and canning.

Chum salmon usually began to arrive in large numbers near the village in late summer. While they were not considered as desirable for human consumption as king or sockeye salmon, they usually were plentiful, easily available, and made good "dry fish." Chum salmon were a major source of food for dog teams, which were used for upriver trapping and trading excursions until the late 1950s.

By October each year the glacially-fed streams had begun to clear, allowing good visibility into the water. Selective fishing with the gaff hook and pole allowed fresh chum or coho salmon to be harvested individually among the spawned-out and decaying fish. Traditionally, chum and coho salmon were taken during winter for immediate consumption as fresh boiled fish. Winter salmon that were not eaten fresh were packed in snow.
outside the house until warm spring weather began to thaw the fish. The fish were then lightly smoked and were said to have a flavor distinct from other preserved salmon.

Because of the short days and long winter nights, fishermen would sometimes fish after nightfall for coho or chum salmon. Fishermen used a birch torch (in later years an oil lantern) to illuminate the water so that fish could be selectively gaffed. Generally, the fish that appeared to have the larger tails were taken because their meat would be much firmer than the decomposing short-tail or ragged-tail fish.

The 1982 Salmon Fishery -- General Patterns

Salmon fishing continued to be an important part of the economy of Klukwan in 1982. Most residents participated in the harvesting or processing of salmon. As is described in a later section, in 1982, salmon were primarily taken by men in the village by the use of set gill nets. A few women participated in fishing activities and many women were involved in processing the fish.

By far the most desired and harvested salmon in the Klukwan area in 1982 was the sockeye. Primarily stored for later use, the sockeye was considered to be a superior fish for a number of reasons: the dependability, abundance, and duration of runs of this fish during parts of the summer when weather was ideal for fishing, drying, and smoking; the meat is firmer and drier, easier to smoke, dry, and prepare; the ease of handling and processing due to the size of the fish (generally under ten pounds); and the preferred taste, especially when kippered, smoked, and canned.
In recent history sockeye have first appeared in the Chilkat River near the end of May or the first part of June. The earliest run remembered by local residents had passed by Klukwan around May 15. Probably due to the unusually warm waters of the Tsirku River fan, sockeye salmon in good condition for eating have reportedly been caught as late as February. Generally, fishing reaches its peak from early July through early August.

King salmon also are caught in gill nets during the early sockeye runs. Occasionally small king salmon are caught; less frequently a large king salmon gets tangled in the net. The observed ratio of king salmon to sockeye salmon caught appeared to be very low. The few king salmon which are caught are highly valued. Local residents believed the king run to be relatively small, and most of the king salmon were reported to have passed Klukwan by early July.

In 1982, chum salmon were caught sporadically throughout the late summer. During August and September large numbers of chums moved up the river, heading toward spawning grounds farther up the Chilkat and Klehini Rivers. Chum salmon were not considered as high quality as sockeye. Chum salmon complement the sockeye in providing supplies of dried and smoked fish. Under present policies, permits are not issued for the taking of individual chum salmon through the winter.

In 1982 subsistence salmon fishing on the Chilkat River was opened June 13, by the Division of Commercial Fisheries, Department of Fish and Game. The river was fished by residents of Haines and Klukwan, residents living along the Haines highway in the Haines Borough, and other state residents who requested a permit. Table 4 lists the places of residency of persons obtaining permits in 1982.
TABLE 4
1982 SUBSISTENCE SALMON FISHING PERMITS
FOR THE CHILKAT RIVER BY PLACE OF RESIDENCY

<table>
<thead>
<tr>
<th>Location</th>
<th>Permits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klukwan residents</td>
<td>32</td>
</tr>
<tr>
<td>Haines area residents</td>
<td>250</td>
</tr>
<tr>
<td>Juneau</td>
<td>22</td>
</tr>
<tr>
<td>Skagway</td>
<td>8</td>
</tr>
<tr>
<td>Sitka</td>
<td>3</td>
</tr>
<tr>
<td>Anchorage</td>
<td>3</td>
</tr>
<tr>
<td>Hoonah</td>
<td>1</td>
</tr>
<tr>
<td>Tok</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>320</strong></td>
</tr>
</tbody>
</table>

(Source: Division of Commercial Fisheries, Alaska Dept. of Fish and Game, 1982.)

Permits were issued for subsistence fishing with set gill nets on the Chilkat River, upstream from Zimovia Point to a point one mile above the Wells Bridge (Figure 2 and Appendix). In 1982, people fished along the Chilkat River from approximately mile 9 of the Haines Highway to an area just north of the Wells Bridge. Most residents of Klukwan fished in a smaller area which begins below the village at mile 20 on the Haines Highway and continues upstream to a point approximately halfway to the Wells Bridge (Figure 2). The majority of the area used in 1982 was on land patented to the village of Klukwan. Drift gill nets were allowed in salt water in areas open during commercial fishing periods. The Chilkoot River and Lake systems were closed to gill net salmon fishing in 1982. Only rod and reel fishing is presently allowed in these areas.

Rod and reel fishing on the Chilkoot River is primarily for sockeye and coho salmon. Participants include local residents, other Alaska residents, and out-of-state and Canadian visitors, many from Whitehorse, Yukon Territory. Fishing with rod and reel on the Chilkat River occurs in the fall of the year, primarily for coho salmon by local residents as...
well as outside groups mentioned above.

**Historical Salmon Fishing Technology**

Immediately across the river from the village of Klukwan the Tsirku River joins the Chilkat River, creating a large alluvial fan. The numerous small, braided channels at the mouth of the Tsirku River provided shallow sloughs where salmon could be obtained from the shoreline, even when waters were cloudy with glacial silt. Klukwan residents harvested salmon in these shallow waters with a gaff hook attached to a wooden pole 10 to 15 feet long. Working from the shoreline or standing in a canoe the fisherman drew the gaff hook along the bottom and quickly jerked the hook upward when he felt a fish brushing against the hook or saw a salmon near the hook.

Several types of gaff hooks were used, made of differing materials, and designed for specific species of salmon (Figure 3). Iron gaff hooks were introduced through trading and eventually replaced hooks of wood, bone, and antler. For sockeye salmon, fishing gaffs were designed with a 3 to 4 inch gap between the point and shaft, while for king salmon a 4 to 5 inch gap was preferred. Some hooks were detachable from the pole shaft and were connected by a lanyard of braided string to prevent a struggling salmon from breaking the shaft or tearing itself free. Depending on river conditions and the fisherman's skills, spears with detachable tips mounted on wooden poles were occasionally used instead of the gaff.

By fishing channels that naturally funneled salmon into the narrow and shallow areas, fishermen were able to effectively and efficiently harvest large quantities of fish. A village elder who fished by these methods...
Figure 3: Traditional Gaff Hooks Used for Salmon Fishing

1 Stewart 1971.
remembers lining a canoe up the Tsirku River with a group of other men from the village to fish. By using the pole-and-gaff technique it was common for an individual to harvest 50 sockeye salmon in a single day. After the canoe was loaded with fish the trip back was a short float downriver to the Chilkat and across the river to Klukwan where the fish were smoked or dried.

Fishing with the pole-and-gaff hook became difficult if the river froze over. According to long term residents of Klukwan, during the past twenty years the portion of the river in front of the village has frozen less compared to twenty to forty years ago, when a midwinter freezeup was more common.

Set gill nets had limited use for salmon fishing in the Chilkat River near Klukwan. Until recently nets were neither strong nor durable and required frequent maintenance and replacement. This involved an expense that many could not afford, especially if they were not commercial fishermen who had access to such equipment. In addition, set gill nets required special river conditions in order to function properly. Changes in water level, debris in the water, and ice conditions made net fishing less effective.

Contemporary Salmon Fishing Methods

Klukwan fishermen set gill nets from both shores of the Chilkat River. Setting the gill net requires knowledge of the river and its currents, effects of seasonal water level fluctuations, and the river's shoreline and bottom.

Experienced fishermen looked for a natural point or bend in the river
which deflects the current toward midchannel, causing an upstream current or eddy near shore. Where the deflected downstream current and upstream current meet, a narrow column of still water creates conditions ideal for holding the gill net in place. According to residents, in these areas salmon congregate in groups, probably resting in the slack waters before continuing upstream.

Fishermen staked one end of the net on shore, stringing the net out along the eddyline from a skiff. The net was stabilized with a float on the surface and a small anchor or weight on the bottom of the net. Since most of the fishing effort was directed toward sockeye salmon, 5 1/3 inch mesh net was commonly used -- usually less than ten fathoms in length, with a lead line at a depth of three to four feet. Later in the summer a shorter net with slightly larger mesh (6 1/3") was used for chum and coho salmon. The best sites were those where the eddy was not subject to change by rising water or shoreline erosion.

Good sites often were understood to be available for individuals or families who had used these sites in the past. These sites were generally recognized and respected by other Klukwan residents. If a site was not being used, the owner often gave permission for someone else to use it. A local resident fishing one of these spots usually moved his net elsewhere when the owner desired to fish the site. If a person wished to "reserve" an area for future fishing, an anchor and marked float were often placed in the desired location. In 1982, competition for good sites was not reported to be a major problem except for certain sites immediately down river from Klukwan (mile 20 to 21) next to the Haines Highway. These fishing sites are easily accessible to the numerous travelers on the
highway. Residents of Klukwan commonly reported conflicts in this area with people who are traveling through on the highway. During the peak of the fishing season (July and August) people of other southern Alaska communities (Haines, Juneau, Sitka, and Hoonah) who are friends of relatives of residents of Klukwan use fishing sites on the Chilkat River near Klukwan. This use was reported not to conflict with residents' activities.

In 1982, the south shore of the Chilkat River opposite the village was productive for salmon fishing. Small skiffs were used to cross the river, which is narrow and swift at this point. As previously mentioned, on the opposite shore a portion of the Tsirku River enters the Chilkat River. Residents who fished this area had to move their nets frequently to adjust to changing channels and currents along the shoreline. An average of 4 to 5 nets fished in this area on productive fishing days. In this area, sites that were unoccupied were generally open for use by others, unless a float was left anchored as an indication the site would be used soon.

Near the end of July, two weeks of warm, sunny weather temporarily halted most salmon fishing near Klukwan. Between July 19 and August 2 temperatures peaked at over 100°F, causing rapid glacial runoff at the headwaters of the Chilkat, Klehini, and Tsirku rivers. This resulted in high water in the Klukwan area where most of the water from these drainages is funneled. High water changed or eliminated many of the eddies used for fishing and also filled the river with floating roots, grass, and stumps which could foul and damage set gill nets. Because the sockeye salmon runs on the Chilkat typically last throughout the summer, this temporary condition reportedly did not have a significant detrimental effect on the
overall 1982 salmon harvest.

In recent years, many residents, especially younger ones, have used rod and reel, rather than a set gillnet, to take coho salmon. The rod and reel have replaced the presently illegal gaff hook as a means of selectively harvesting coho.

Historical Preparation and Preservation of Salmon

Historically, catching fish was the work of the adult males of the community. Once the fish were brought to shore, the women cleaned and processed the fish, although they were at times assisted by men and children. An elderly male resident recalled: "Women never did fish, they weren't supposed to. They cleaned and smoked the fish." In addition to catching the fish, men were also expected to gather wood and keep the smokehouse operating.

Fish that were to be smoked or dried were first "firmed up" by threading a line through the gills and placing the fish in the river from 1 to 3 days. This caused the fish to become firm for easier cutting. This method of preparation also gave the smoked fish a desirable texture.

Smoking and drying were usually done during the summer months to take advantage of warm, dry weather. Smoking during the wetter, colder months of late summer and fall frequently was hampered by mold. Cut salmon were allowed to soak in a brine solution or were smoked plain for a period of one day to a week, depending on the desired dryness of the fish, ambient temperatures, and the kind of smokehouse used.

Two types of smokehouses have existed in Klukwan since the turn of
the century. The enclosed smoke house was a small shack approximately 8 by 10 feet with a covered smoke vent in the roof. A small smoldering fire was started in a hole in the earth floor with willow, alder, or maple branches. Fish were hung or laid out on racks above the smoke pit.

The second type of house was the open smokehouse, which was open on the sides and had a roof to keep the rain off the racks of hanging fish inside. The sides of this type of house were sometimes enclosed with netting or chicken wire and a small, smoky fire was used to keep insects off the drying fish. The main drying force of the open smokehouse was not the fire, but the warm, dry summer breeze that moved through the house.

Fermented portions of salmon were highly prized delicacies and were saved for special occasions. K'inkw or fermented salmon head and kaha'akw or fermented salmon eggs are two examples of such products.

**Contemporary Preparation and Preservation of Salmon**

Traditional methods for preparing and preserving salmon were practiced in 1982. The actual fishing seemed to be performed by a small group of men with knowledge of the river and its currents, the mechanics of setting a gill net, and skiff operation. These fishermen provided salmon for a number of households besides their own.

The historical practice of allowing the fish to "firm up" in fresh water was common. To protect the catch from river otters, some residents placed the whole ungutted fish into a covered barrel rather than leaving the fish in the river. After the fish had firmed, many were distributed to members of other households who did not fish. These individuals cleaned
and preserved what was given to them and often processed some of the fisherman's catch in exchange for his sharing. Sharing of preserved fish with others in the village was also common.

Methods used to clean, cut, and preserve the salmon varied depending on individual tastes and methods learned. Common salmon products preferred by residents included: 1) sockeye brined with salt and brown sugar and lightly smoked or "kippered," and later canned to keep fresh; 2) king salmon dried as brine strips and salted bellies; 3) plain, canned salmon; 4) salmon strips and backs, hard dried without brine; 5) frozen coho and king salmon; 6) boiled fresh salmon; 7) fermented salmon heads, (k'ink'); and 8) fermented salmon eggs. (kaha'akw).

Both enclosed and open-sided smokehouses were used in Klukwan in 1982. The enclosed smokehouse was most common, although a few open smokehouses or drying houses were also in operation. The importance of preserved salmon in the village was evidenced by the 15 to 20 active smokehouses that lined the river.

SUMMARY

The local economy of Klukwan in 1982 was based on a combination of cash earning and harvesting local fish and wildlife resources for domestic use. Sources of cash income in Klukwan are limited and seasonal. A major portion of the local food supply is derived from fishing for salmon in the Chilkat River. The village is ideally situated on a confined portion of the Chilkat River, adjacent to the Tsirku River, an important tributary for spawning salmon. Also, nearby upwelling warm waters provide a freshwater habitat where salmon exist nearly year-round.
Regulations regarding methods and seasons of harvest have played a major role in shaping present practices of local salmon fishing. Past techniques have included the use of efficient and selective fishing tools such as nets and gaff hooks attached to long poles. The present technique of set gill net fishing requires special river conditions in order to be effective. Environmental factors that cause changes in water level or shoreline configuration frequently make net fishing ineffective for brief periods throughout the summer months. Under present regulations the fisherman is dependent upon a lengthy salmon run in order to harvest sufficient quantities of fish.

In 1982 most of Klukwan's fishing activity took place on the Chilkat River in the immediate vicinity of the village. Historically salmon fishing took place throughout the Chilkat River drainage as well as its major tributaries.

Because of its dependable runs, abundance, and suitability for preserving, sockeye salmon is the most frequently used salmon species. King salmon, chum salmon, and coho salmon are also widely used as fresh and preserved fish, but not in quantities as great as sockeye. Traditional methods of preparing and preserving salmon are common today. Large quantities of salmon are smoked, dried, canned, and frozen for use throughout the year. Eulachon, harvested in the spring, is also an important source of food and oil.
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ARTICLE 14.
SOUTHEASTERN ALASKA AREA.

5 AAC 01.700. DESCRIPTION OF THE SOUTHEASTERN ALASKA AREA. The Southeastern Alaska area includes all waters between a line projecting southwest from the westernmost tip of Cape Fairweather and Dixon Entrance. Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.705. DESCRIPTION OF DISTRICTS AND SECTIONS. Districts and sections are as described in 5 AAC 33.200. Authority: AS 16.05.251(a) (2) and (b)

5 AAC 01.710. FISHING SEASONS. (a) Unless restricted in this section, 5 AAC 01.725, or under the terms of a subsistence fishing permit, fish may be taken in the Southeastern Alaska area at any time.

(b) Halibut may be taken only from March 1 through October 31.

(c) Herring may be taken at any time except that vessels licensed as commercial fishing vessels may not be used to take herring for personal use in any district that is open for commercial herring fishing for 72 hours before, during, and 72 hours after any open commercial herring fishing period for that district when the vessel has aboard any person holding a Southeastern Alaska area winter or herring seine interm-use or entry permit.

(d) Coho salmon may be taken from Salt Lake above the falls at the head of Mitchell Bay from August 1 until an annual harvest limit of 500 coho salmon has been taken or through October 31 if the annual harvest limit has not been taken.

Authority: AS 16.05.060
5 AAC 01.720. LAWFUL GEAR AND GEAR SPECIFICATIONS. Fish may be taken by gear listed in 5 AAC 01.010(a) except as may be restricted under the terms of a subsistence fishing permit and except as follows:

(1) In district 13, Redoubt Bay, gill net or seine gear may not be used to take salmon in any waters of the bay closed to commercial salmon fishing;

(2) Set gill nets may not be used to take salmon except in the mainstream and side channels, but not the tributaries, of the Chilkat River from the latitude of Zimovia Point to one mile upstream of Wells Bridge;

(3) Halibut may be taken only by a single handheld line with not more than two hooks attached to it.
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(4) beuh smnes and gaffa only may be used to take coho salmon during the season and in the area described in 5 AAC 01.710(d).

Authority: AS 16.05.251(a) (2), (4), (7) and (b)

5 AAC 01.725. WATERS CLOSED TO SUBSISTENCE FISHING. The following waters are closed to subsistence salmon fishing:

(1) in district 1:

(A) repealed 4/14/82;

(B) Mahoney Creek in George Inlet;

(C) Naha Bay, Roosevelt Lagoon and within one statute mile of the falls at the outlet of Roosevelt Lagoon;

(2) in district 11:

(A) repealed 4/14/82;

(B) repealed 4/14/82;

(C) the Taku River drainage;

(3) in district 15. Lynn Canal including Chikat, Chilkoot and Lutak inlets, during the closed periods of the commercial salmon net fishery in the district.

Authority: AS 16.05.251(a) (2), (7), (10) and (b)

5 AAC 01.730. SUBSISTENCE FISHING PERMITS. (a) Salmon, trout, char and herring spawn on keep may only be taken under authority of a subsistence fishing permit.

(b) Permits will not be issued for taking king or coho salmon, except for king and coho salmon in the Chikat River adjacent to Klukwan and for coho salmon as provided in 5 AAC 01.710(d).

(c) In the Chikat River north of the latitude of Zimova Point, the subsistence fishing permit holder shall be physically present at the net while it is fishing.

(d) Subsistence salmon fishing permits for the fishery provided for in 5 AAC 01.710(d) will be issued only to those persons domiciled in Angoon and only one permit will be issued for a household. The number of coho salmon that may be taken on a permit will be specified by the department after it has assessed the level of effort that will be involved in that fishery.

(e) The department shall adhere to the following when issuing subsistence salmon fishing permits.

(1) fishing effort must be allowed in places and during times when resource abundance will allow a harvest without jeopardizing the sustained yield of the stock and in a manner which provides for an orderly fishery;

5 AAC 01.730.
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(2) any gear must be allowed which is efficient and economical in light of local circumstances and which provides for an orderly harvest without waste of the resource;

(3) there is no annual possession limit for individuals; additional permits may be issued to a permit holder if harvestable surpluses are available;

(4) permits may be issued specifying times, areas, species and numbers of fish that may be taken.

(5) When a permit is denied under the guidelines in (e) of this section, the commissioner or his designee shall determine if the requested use is a subsistence use by applying the Joint Boards of Fisheries and Game criteria for the identification of subsistence uses. The commissioner or his designee shall issue the permit if he determines that the request is for a subsistence use and the sustained yield of the stock will not be jeopardized.

Authority: AS 16.05.251(a) (2), (7), (12) and (b)

§ AAC 01.740. MARKING OF SUBSISTENCE TAKEN SALMON. Subsistence fishermen shall immediately remove one half of the caudal (tail) fin of all salmon when taken.

Authority: AS 16.05.251(a) (2), (4), (5), (7) and (b)

§ AAC 01.745. SUBSISTENCE QUANTITY AND POSSESSION LIMITS. The daily bag and possession limit for halibut is two. No person may possess sport taken and subsistence taken halibut on the same day.

Authority: AS 16.05.251(a) (3), (7), (10) and (b)

§ AAC 01.747. SUBSISTENCE FISHING POLICY FOR THE JUNEAU, PETERSBURG, WRANGLER, SITKA AND KETCHikan ROAD SYSTEMS. (a) Salmon streams flowing across or adjacent to the road systems of Juneau, Petersburg, Wrangle, Sitka and Ketchikan support only limited runs of salmon. Harvestable numbers of salmon in excess to the spawning escapement needs for those streams are normally of such a small magnitude that these numbers alone are not sufficient to support the consumptive demands of those communities. Therefore, permits allowing the use of nets shall not be issued for streams along the road systems of those communities.

(b) repealed 4/14/82

Authority: AS 16.05.251(a) (2), (3), (4), (7), (12) and (b)