CUSTOMARY AND TRADITIONAL KNOWLEDGE OF SOCKEYE SALMON SYSTEMS OF THE K`IIS XAADAS (Hydaburg Haida)

Final Report for FRMP 07-651

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K'iis Xaadas elder and noted TEK expert Robert Sanderson observing subsistence beach seining of sockeye salmon at Hetta Inlet, 2007

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FINAL REPORT SUMMARY PAGE

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Abstract: K'iis Xaadas (Alaskan Haida occupying the western region of the southern Prince of Wales Archipelago) traditional knowledge of and practices with salmon have developed over several thousand years in Haida Gwaii, British Columbia and southeast Alaska. This report provides an overview of that knowledge and those practices including information provided by K'iis Xaadas elder/experts on salmon biology, distribution, timing, habitat, behavior, ecological relationships, and the mythic charter that informs traditional relations with salmon. Also included is information derived from historic documents related to Xaadas territorial claims, early observations of US fisheries officials and stream descriptions from governmental reports.

Key words: Traditional knowledge, K'iis Xaadas, salmon, biology, ecology, streams, harvesting, traditional concepts, cultural practices, historic changes

Project data: Primary data for this study consist of tapes and transcripts of interviews conducted with K'iis Xaadas elders and experts, both in the village and in the field. Additional data was acquired from field visits to the streams, from historic documents and from published stream catalogues. Tapes, transcripts, photos, and other written materials used in the report have been archived with the University of Alaska Anchorage, Department of Anthropology, 3211 Providence Drive, Anchorage, Alaska, 99508 and also with the Hydaburg Cooperative Association, Box 349, Hydaburg, Alaska 99922.

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The interpretations and any errors in the report are the sole responsibility of Dr. Steve J. Langdon.

I. INTRODUCTION

For the K'iis Xaadas (Hydaburg Haida) of the southwest section of the Prince of Wales Archipelago, salmon have been at the heart of their existence since they moved to Alaska. Traditionally, sockeye salmon streams were of highest importance to the people. In early July 1799, William Sturgis, the most renowned of the Boston captains of the maritime fur trade era, traveled from Kaigani at the southern end of Dall Island over 40 miles "up a narrow intricate arm of the sea" to reach "Claglass [Klakas], "a summer village" (Sturgis 2000:50). Unbeknownst to him, Sturgis was visiting a K'iis Xaadas summer fish camp at which sockeye from the traditionally owned stream at Klakas were being harvested and processed for winter consumption and ceremonial distribution. Since that initial observation over 210 years ago, the K'iis Xaadas have maintained their relationship with and use of those same sockeye salmon. Though the technological, social, economic, political, ceremonial and cosmological bases for those relations have been transformed, sockeye salmon are still at the heart of K'iis Xaadas existence. That continuing relationship has been sustained through, among other things, the passage of traditional ecological knowledge and a powerful sense of trusteeship from one generation to the next which enables each generation to continue to construct a relationship with salmon.

Project overview

This is the final report of a research project concerning the sockeye systems of the southwestern quadrant of the Prince of Wales Archipelago of southeastern Alaska. More specifically the research reported addresses the subsistence use and K`iis Xaadas traditional ecological knowledge concerning these resources through a variety of sources including interviews with key elder/experts of the K`iis Xaadas. The report integrates information and data from a variety of sources including stream catalogues, historic documents, and legal proceedings to provide both a general view of the sockeye systems and system specific information. Further, the report documents the current status and use of the sockeye systems through field observation (including photos and video footage). In addition, the report discusses key issues related to the biological status of the resources and the subsistence use of the resources. Finally, the report presents recommendations based on the findings for future tribal actions related to sockeye system sustainability and the sustainability of subsistence uses of those resources by K'iis Xaadas residents of Hydaburg. Those recommendations are intended to assist federal fisheries managers in meeting their responsibilities in regard to the subsistence fisheries of the K'iis Xaadas.

The report is important to the objectives of Federal subsistence fishery management program in that it:

1) provides data about the status of critical subsistence resources;
2) provides information on early commercial impacts on these sockeye salmon systems;

3) provides an assessment of baseline expectations for the productivity of many of the sockeye systems used for subsistence based on 19th century harvest levels;
4) aids managers in understanding key issues in the management of these sockeye systems and the approaches the Hydaburg Cooperative Association seeks to utilize in addressing those issues.
5) offers recommendations concerning the development of tribal management of sockeye resources used by the K'iis Xaadas.

Finally, the research and this resulting report are also important in that activities undertaken to acquire data and the systematic recording and preservation of data, both TEK and biological/ecological, improve the technical abilities of the Hydaburg Cooperative Association as a tribe to acquire data, assess data and use the data in planning, decision-making and informing the tribal community. In particular, the on-site field observations portion of the research made it possible for two younger generations of K'iis Xaada leaders to learn from and receive traditional ecological knowledge training from the most knowledgeable elder/expert of the K'iis Xaadas, 80 year old Robert Sanderson.

The report is primarily addressed to the sockeye systems of the K'iis Xaadas traditional tribal territory. However included in the TEK data collection from elder/experts is information of a more general nature about salmon, subsistence use and changes in the position of various salmon species in the subsistence utilization mix over the lifetime of the elder/experts.

K'iis Xaadas Tribal Territory

K`iis Xaadas traditional territory extends minimally from Cape Chacon at the southern end of Prince of Wales Island west to Cape Muzon encompassing all of Dall Island and Forrester Island offshore, and passing north through Meares Passage separating Dall Island from Suemez Island to the vicinity of Waterfall then following a line to the middle of Prince of Wales Island and south to Cape Chacon (see Figure 1). This basic K`iis Xaadas territory appears in both Niblack (1888) and in Goldschmidt and Haas (1998) demonstrating the longevity and coherence of this geographic description of K`iis Xaadas territory.

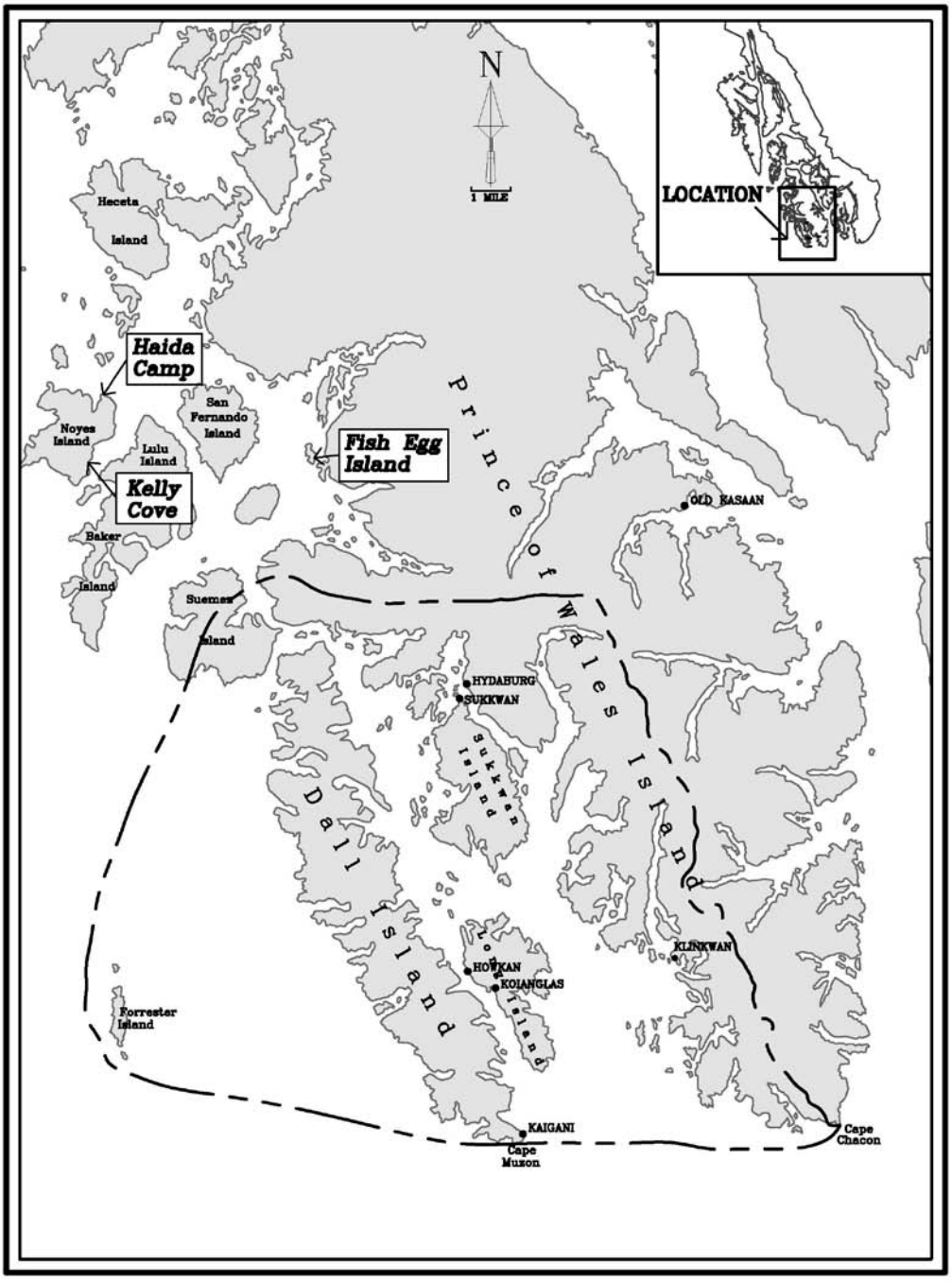


Figure 1 K'iis Xaadas traditional territory and villages. Also depicted are other key sites utilized and recognized as K'iis Xaadas territory

Within this traditional tribal territory, K'iis Xaadas recognize 16 sockeye systems about which traditional ecological knowledge based on oral tradition, personal use and observation exist. These streams which this report addresses are presented in Figure 2.

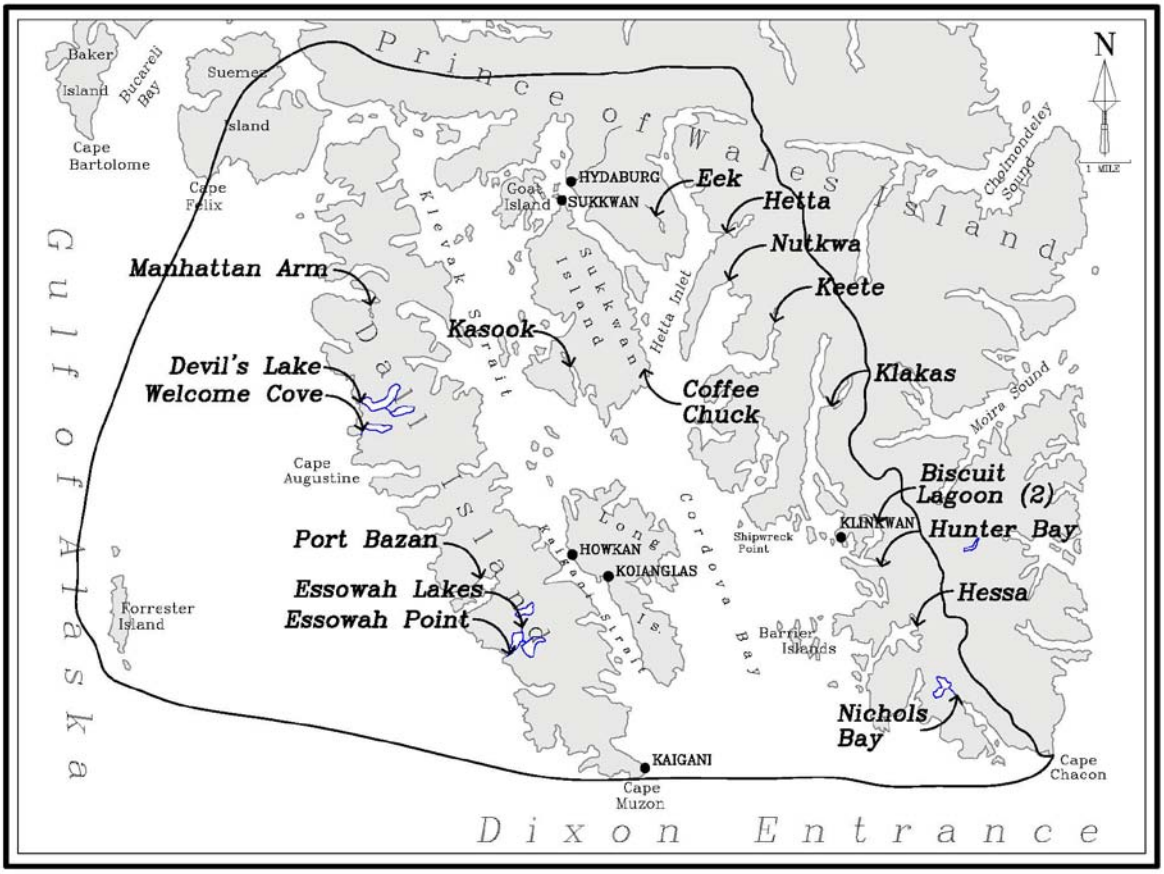


Figure 2 Customary and Traditional Sockeye Systems Utilized by the K'iis Xaadas

Objectives

Sockeye salmon are one of the most important subsistence resources utilized by the K`iis Xaadas of Hydaburg. Household subsistence studies were conducted in Hydaburg in 1987 and 1997 (ADFG 2002). According to the 1997 study, sockeye salmon were the most important single subsistence food obtained by the residents of Hydaburg (ADFG Community Profiles). A total of 37,086 pounds were estimate or nearly 100 pounds per capita. This amount represents 50% more than halibut poundage utilized and nearly three times the amount of deer meat harvested per capita for Hydaburg residents. Informal information on sockeye harvests obtained by Hydaburg Cooperative Association (HCA) leaders indicates that the amount of subsistence sockeye harvested may have been reduced by as much 75% in several recent years. In addition wide fluctuations in sockeye abundance and harvests from key streams have been documented in the period from 2000 to 2008. As a result, many tribal members and families have been unable to meet their subsistence goals. In addition, subsistence harvests on weak runs may cause reduction in future abundance.

In light of these circumstances and the critical questions concerning the status of sockeye stocks and their use as a key subsistence resource by Hydaburg residents, research to examine the issues was designed. The basic purpose of this collaborative project

involving the Hydaburg Cooperative Association and Dr. Steve J. Langdon of the University of Alaska Anchorage has been to address the issues of low sockeye returns by collecting customary, traditional and contemporary knowledge about sockeye salmon and uses, investigate underutilized sockeye salmon systems and address sockeye salmon sustainability, biologically and nutritionally, for the K`iis Xaadas.

Specific objectives of the project are to:

1) acquire traditional ecological knowledge (TEK) and use information on sockeye salmon from elder/experts concerning both utilized and non-utilized systems in the traditional territory of the K`iis Xaadas;
2) obtain biological, ecological, historical and other information on selected utilized and presently non-utilized sockeye systems;
3) conduct field site investigations of selected sockeye systems with elder/experts in order to document system conditions and current status (presence/abundance) of sockeye salmon;
4) integrate the information into a database including a GIS component;
5) develop recommendations for tribal planning and management to sustain sockeye abundance and human customary, traditional and nutritional uses of sockeye salmon by K`iis Xaadas tribal members.

Report Overview

The report is organized as follows: chapter II presents the research methods used, chapter III provides pertinent tribal background, chapter IV presents traditional ecological knowledge related to salmon generally and sockeye salmon specifically, chapter V provides integrated stream specific information, chapter VI provides a discussion of findings and chapter 7 presents conclusions and recommendations for future activities.

II. METHODS

The research undertaken to fulfill project objectives required a variety of research methods.

Traditional Ecological Knowledge Interviews

For objective 1, Dr. Steve J. Langdon designed an interview protocol for the conduct of interviews with elder/experts concerning traditional ecological knowledge of sockeye salmon similar to that used in research on Tlingit salmon TEK (Langdon 2006). The interview protocol can be found in Appendix A. The interview protocol is designed with several principles in mind. First, it solicits responses in the Haida language thereby making possible the identification of concepts and concept linkages within the language as given by the interviewees. Second, it builds on narrative practice by asking for accounts of particular activities based on experiences and traditional practices of story telling. Third, it searches for earliest remembrances of teachings about salmon from the interviewees either through myth accounts or through other oral traditions they have learned. Fourth, a series of structured, but open-ended inquiries are then posed on a variety of topics which still allow for variation and commentary by interviewees. For example, when asking about the names for parts of the salmon, one interviewee began discussing how he recalled elders' concerns about the prevalence of sea lice on salmon in the past. In addition, if at all possible, interviews should be place-based, that is conducted at the site of critical subsistence activities. For this research, it was not possible to follow-up these interviews with a group interview that can be useful to clarify questions and identify new information. Finally, a broad range of interviewees were identified that includes men and women and persons familiar with different places. Haida, like most other Alaska Natives, orient their activities on the land and sea towards different localities based on various cultural, historical and personal factors. Therefore often experiences and knowledge are place-based and significant information may be missed if attention is not paid to the spatial distribution of activities by different persons or sub-groups of the society.

Six elders were selected by Robert Sanderson in consultation with Tony Christianson and Gideon Duncan for elder/expert interviews. They were selected primarily on the basis of their age, knowledge and experiences. The six elder experts included Francis Carle, Claude Morrison, Woodrow Morrison, Harris Natkong Jr., Anna Peele and Robert Sanderson. With the exception of Robert Sanderson, who was interviewed in the offices of HCA, all other interviews were conducted in the houses of elder/expert. While the designed protocol was used to discuss key topics, interviewees were encouraged to provide narratives about their own experiences or other special topics of importance to them. Dr. Langdon conducted the interview with the assistance of Robert Sanderson; the interview was recorded on digital video by Gideon Duncan and Benjamin Young. Subsequently, at the University of Alaska Anchorage, audio files were extracted for transcript production. While interviewees were encouraged to provide narratives in Haida, only one person did so and only for a short portion of the interview. Transcripts were initially prepared by various staff members of the Hydaburg Cooperative Association and were subsequently edited by Dr. Langdon. All digital video and audio

CDs and interview transcripts are stored in the HCA offices in Hydaburg, Alaska. Dr. Langdon also has a copy in his office at the University of Alaska Anchorage, 3221 Providence Drive, Anchorage, Alaska 99908.

Documentary records and other relevant writings

Objective 2 involved the collection and integration of data from a variety of documentary sources, both primary and secondary. Biological and ecological data on the sockeye systems was acquired by Dr. Langdon from federal and state stream catalogues prepared during the past 50+ years by various federal and state agencies. The primary federal document was Orrell, Rosier and Simpson (1963) a stream catalogue summarizing available stream survey and weir count data for a number of streams in district 3 which includes the waters of Cordova Bay between Dall and Prince of Wales Island. This document, however, provided no data on the streams of the outer coast of Dall Island found in district 4. The state documents used for this study were Edgington et al. (1981) for district 3 and Novak et al. (1975a and b) for districts 2 and 4. State documents begin their coverage at 1960 without including previous observations. Primarily designed to track pink salmon productivity, the State documents do not provide summary information from federal documents created prior to Statehood. Both Federal and State documents vary in terms of their coverage of various streams with the streams of the outer coast of Dall Island having the most limited information while the highly productive systems such as Nutkwa and Hunter's Bay having a substantially amount of greater information. The information from these documents for most streams is typically based on one or two visits by biologists involving stream walks to observe and record habitat characteristics of the stream especially relevant to salmonid production. Also included are annual (or multiple in season) estimates of peak counts observed during walks or flyovers and the presence of various species of salmon. Notably absent in these documents is reference to conversations with local experts such as resident Haida, commercial fishermen or trappers who are present at the streams on a much more frequent basis that the fisheries biologists. Mr. Robert Sanderson carefully reviewed those documents and compared them to his own experiences and the information he has received during his lifetime from Haida elders and fishermen. The documents were useful in orienting the field research portion of the project. Historical documents with descriptions of the systems and commercial fisheries of the area of significance were also accessed as discussed below.

Of greater value were the reports, photos and deck logs associated with the visit of the Bureau of Fisheries vessel "Albatross," directed by Commander Jefferson Moser, to the area in 1897 and 1900 (Moser 1899, 1902). The reports provide crucial information on the beginnings of the commercial salmon (canning, salting and cold storage) industry in the area, and are particularly significant in establishing evidences for baseline sockeye salmon productivity in the primary streams utilized for subsistence sockeye by the K'iis Xaadas today. Moser also provides important information on the establishment of relationships between the non-Native commercial operators and the Haida leaders, in particular noting the use of leases between the operators and owners to pay for the rights to salmon from certain streams. The descriptions of the means of harvest, most especially the use of barricades at the mouths of streams to block upstream movement of salmon, are important to comprehending the consequences of early commercial salmon

harvesting practices for subsequent sockeye salmon productivity. In addition to the reports themselves, archival photos and log books of the Albatross were accessed in the holdings of the US Fish and Wildlife Service at the National Archives located in College Park, Maryland. Numerous photographs and sketches taken during Moser's field visits are included in this report.

Another key documentary source about the customary and traditional sockeye salmon resources of the K'iis Xaadas are the records associated with the US Department of Interior hearings on the Hydaburg petition for a determination on aboriginal rights to lands and waters filed in 1944. The petition, in its initial and amended forms, details the tribal territory jointly claimed, the specific territories within the tribal territory under the ownership/trusteeship of certain named leaders, and the salmon streams under the ownership/trusteeship of certain named leaders. Hearings were held in Hydaburg in September of 1944 before Judge Hanna at which time a number of Haida elder men were called upon by the Department of the Interior lawyers to testify to their knowledge

Figure 3 Important contributors to K'iis Xaadas cultural heritage information are pictured in this photo from 1912. Matthew Charles is on the far left in the back row. Paul Morrison, third from the left in the back row, holds his son Claude. Helen Sanderson, mother of Robert Sanderson, is the girl on the far right in the front row. Matthew Charles was a primary source for information about K'iis Xaadas traditional territories and stream ownership. Paul Morrison was a key witness at the Hanna hearings in 1944. Helen Sanderson was the primary translator at the Hanna hearings. Claude Morrison provided important TEK information as an elder/expert for this report. Photo courtesy of Woodrow Morrison.

about the traditional territories and waters of the Hydaburg people, the uses of those waters, and the impact of the commercial salmon fishery, particularly the establishment of floating fish traps, on Haida aboriginal rights and the salmon resources. Five elders gave testimony and were cross-examined during the hearings. They are: Powell Charles, Sam Davis, George Haldane, Paul Morrison, and Frank Nix. Their testimony provides important TEK data concerning K'iis Xaadas customary and traditional practices related to and knowledge of sockeye and other salmon in their territory.

Important ethnographic and anthropological publications were also reviewed for information relevant to the project. Niblack (1888) provides an overview and discussion of fisheries and technologies of a general nature while Swanton (1905) is the classic guide to the social structure and population history of the Haida, including the Kaigani Haida occupation of southeast Alaska. Swanton (1905, 1909) provide important myths and texts relevant to traditional Kaigani Haida relations with salmon. Subsequent ethnographic work by Blackman (1981, 1990), Vaughan (1985) and Wright (2002) also provided some information on the culture and history of the K'iis Xaadas. Vaughan (1985) is useful in tracing the 20th century institutional development of the community and the political and economic context in which it occurred while Wright (2002) provides important detail on the lineage relationships of key 20th century figures in Kaigani Haida life. Anthropologist Viola Garfield traveled to Hydaburg in 1944 under contract to the canned salmon industry to attend the Hydaburg hearings on aboriginal rights discussed above. Her notes of several interviews and observations of the hearings in Hydaburg at that time are on file in the archives of the University of Washington and were also reviewed as part of the documentary research for this project. Two important publications associated with Haida authors are Pulu (1983) and Cogo and Cogo (1986) which provide additional important information on K'iis Xaadas territory and salmon harvesting technology.

There has been an extremely limited amount of archaeological research done in the territory of the K'iis Xaadas and none that is specifically relevant to their customary and traditional use of salmon, especially sockeye salmon.

Field Observations

Objective 3, to assess the current status of sockeye salmon stocks, required field observations. Field observations were undertaken by vessel in July 2007 and August 2008. In July 2007, the following streams were visited by vessel and some form of observation of the estuary and lower stream was conducted. The trip in July 2007 was scheduled for the middle of July based on the expectation from traditional ecological knowledge that typically runs of sockeye salmon to the streams would be underway at that time. However, sockeye salmon runs began later than expected based in 2007 resulting so that relatively few observations of salmon in stream were made. The following streams were visited by vessel and stream surveys in 2007:

Prince of Wales Island: Eek, Hetta, Keete, Klakas, Hessa, Hunter's Bay and Nichols Bay

Sukkwan Island: Kasook

Dall Island: Manhattan Arm, Devil's Lake, Welcome Cove, Port Bazan, Essowah Lake and Essowah Point.

The 2007 vessel field observations did not include either Biscuit Lagoon or Coffee Chuck due to weather, tide or limited time.

On September 9, 2007 aerial observations and landings were made in order to determine if sockeye salmon had reached their tributary streams and if there were any blockages or beaver dams on streams located above the zone accessed during the vessel based field observations in July. During the aerial flyover, all 16 sockeye systems were covered however the quality of the observations varied primarily due to the canopy which blocked visibility of the stream or the dark waters of the stream. In addition to the aerial flyover, landings were made on the following streams: Devil's Lake and Klakas.

In 2008, vessel based field observations were made during the first week of August at the following streams:

Prince of Wales Island: Eek, Hetta, Klakas and Hunter's Bay
Sukkwan Island: Kasook

During the vessel field investigations the following procedures were followed. All members of the field crew watched for salmon jumps in the saltwater areas inlets and bays through which we passed in transit to the stream. K'iis Xaadas observers made species identifications based on the characteristics of the jump. The intertidal and lower stream zones were examined for evidence of precontact salmon harvesting technologies by Dr. Langdon. Tony Christianson, accompanied by Gideon Duncan, Marita Tolson and on occasion other members of the field crew, walked up the outlet stream toward the lake as far as possible. In a number of cases, the party was able to reach the lake while for longer systems such as Hunter's Bay, Nichols Bay, Hessa and Keete it was not possible to reach the lake. Christianson and others made observations in the stream of blockages due to dams or tree falls. In two cases, beaver dams blocking streams were removed. Stream observers were also watching for salmon, making special note to look for sockeye salmon. While Christianson and others made the stream investigation, Langdon interviewed Robert Sanderson at the mouth of the stream during which the basic traditional ecological knowledge of the system was recorded on digital video by Benjamin Young. Those digital videos were subsequently transferred to DVDs and copies of them are stored at the Hydaburg Cooperative Association offices in Hydaburg and in Dr. Langdon's office at the University of Alaska, Anchorage.

Photos were taken by Dr. Langdon throughout the vessel and aerial field investigations of precontact technologies, local conditions (such as tidal falls and rapid outflows), beaver dams, salmon presence, and other significant identifying features of the various sites. Dr. Langdon took field notes concerning observations and made sketch maps of key features at each of the sockeye systems visited.

The observational data was subsequently integrated through a discussion among Christianson, Duncan, Langdon and Sanderson in the fall of 2008 in which the site and

aerial photos were identified and assigned to various streams. Observations were also reviewed and corrections made where warranted.

Figure 4 Robert Sanderson providing a traditional ecological knowledge interview while being recorded on digital video by Benjamin Young at Eek Inlet, 2007.

III. K'IIS XAADAS CULTURAL AND HISTORICAL BACKGROUND

Tribal Background

The K`iis Xaadas are one of two components of the Haida people of Alaska who are collectively referred to in the ethnographic and historical literature as the Kaigani Haida (Blackman 1981, 1990; Niblack 1888; Swanton 1905; Vaughan 1985; Wright 2002). The other component of the Kaigani Haida are the Kas'aan Xaadas, who have resided primarily at New and Old Kasaan, occupying approximately the southeastern half of Prince of Wales Island from Thorne Arm to Cape Chacon. Other non-Alaskan Haida divisions inhabit Haida Gwaii (Queen Charlotte Islands) south across Dixon Entrance in what is now the Canadian province of British Columbia. While the timing is uncertain, the Haida movement from the Queen Charlotte Islands into the Prince of Wales Archipelago is generally thought to have occurred in the 18th century (Blackman 1981, 1990; Langdon 1977; Swanton 1905; Wright 2002).

Tribal Communities

In the 18th century at the time of Euroamerican arrival, K`iis Xaadas resided in four or five winter villages on the west coast of the Prince of Wales Archipelago including Howkan, Sukkwan, Klinkwan, and Koianglas (Blackman 1990; Cogo and Cogo 1986; Swanton 1905; Vaughan 1985; Wright 2001). Kaigani, near the tip of Cape Muzon on Dall Island, served as the trading village where K`iis Xaadas met outside traders in the 18th and early 19th centuries. Each winter village consisted of one or two matrilineal descent groups and numerous houses under the leadership of heads of named, totemic matrilineal lineages. The houses were occupied by lineal and other relatives, typically based upon marital ties. Slaves also comprised a portion of the house group population. Families from the houses traveled seasonally as groups in large red cedar dugout canoes to various owned resource camps to obtain food and other materials.

Social Organization and Culture

The social organization of the K`iis Xaadas divided the lineages (or clans) into two sides known as the Raven and Eagle. Social rules required that marriages be made with a member of a clan on the side opposite, thus a marriage can only be between a Raven and an Eagle. Children are members of the mother's lineage. Inheritance of position, status and resources flows matrilineally and therefore key positions in the society, as stipulated by Haida ethnographer George Murdock to Viola Garfield are inherited as follows:

> "When a clan or house chief (head) dies he is succeeded by his younger brother; by a nephew (sister's son) only in default of his own brothers. An inheritance is never split, although small objects of personal property may be distributed among several brothers and nephews. All privileges and all property of importance descend in toto to the inheritor" (Garfield 1944).

K'iis Xaadas culture practiced two primary and several smaller forms of potlatch - ritual distributions through which status and property rights were asserted by the hosting families and confirmed by the attending invited guests (Blackman 1990; Murdock 1936). Host lineages formally invited their in-laws and staged feasts, conducted ceremonials and dances, and gave gifts to their guests during the event. The guests were in turn expected

to reciprocate in order to sustain their own claims to status and property and uphold the position of their children in the society. Among the most important types of property owned were salmon streams and the lands nearby and those claims had to be ceremonially confirmed and continued through presence and use of the resource. Traditional territorial ownership including stream ownership is discussed in the next chapter.

Alaska State Library - Historical Collections

Figure 5 Howkan in the late 19th century. The totem poles (*gyaa.aang*) were erected on various occasions including as mortuary memorials for deceased leaders.

Tribal History

When Spanish voyagers undertook six weeks of extended exploration in the northern area of their region in 1779, K'iis Xaadas met with them peacefully and began trading salmon and halibut to them (Olson 2001, Tovell 2008). It should be noted that this trade of salmon began in early May, a time when only king salmon caught by the method of trolling could have brought forth the large salmon referred to in the Spanish accounts.

K`iis Xaadas participated fully in the late 18th and 19th century fur trade; the site and village of Kaigani was visited by over 85 different fur trade vessels between 1790 and 1815 (Vaughan 1985). After the collapse of the sea otter trade around 1810, the K`iis Xaadas adapted by engaging in major production of potatoes which they traded to Port Simpson, Sitka, and Wrangell supplying white populations with fresh food. In 1835, Hudson Bay Company employee John Work estimated the total population of Kaigani Haida as 1735 indicative of a thriving and vibrant population. About 1500 of those enumerated were K'iis Xaadas living in 46 houses distributed across the five villages (Swanton 1905:295). Howkan at 458 and Klinkwan at 417 were the largest villages.

Table 1 provides information on the K'iis Xaadas population in the first half of the 19th century. The number of houses listed by Work is his original census has been modified based on the corrections made by Swanton (1905:295).

Table 1 K'iis Xaadas Villages, Population and Houses: 1836-1841

Village	Population	Houses
Kaigani (You-ah-noe)	234	9
Klinkwan (Click-ass)	417	13
Koianglas (Qui-a-hanless)	151	3
Howkan (How-a-guan)	458	14
Shaw-a-gan (Sukkwan)	229	7
TOTAL	1489	46

Source: John Work cited in Cole and Lochner 1993:165

In mid-19th century, however, the establishment of Victoria and the subsequent travel of the Kaigani Haida to that city to engage in trade, set in motion a sharp demographic decline. Most significantly, the Haida populations suffered severe population losses due to the smallpox epidemic of 1862 and other introduced diseases. By 1880, Petroff's census indicates that the total Kaigani population had dropped to 788 persons. Ensign Niblack in the later part of the decade estimated the population of Howkan as 350 persons and that of Klinkwan as 150 (Niblack 1888). The village of Sukkwan was probably between 50 and 100 at that time. By 1910, the census indicates a total of 318 K'iis Xaadas living in the villages of Howkan and Klinkwan. This precipitous drop in population certainly was a factor contributing to the decision to create the new consolidated village of Hydaburg.

Figure 6 Sukkwan in the late 19th century

Beginnings of the commercial salmon fishery
The trader George Hamilton began a store and saltery at Klawock in 1870 and apparently drew on Haida connections to come north and assist with salmon production. Many K`iis Xaadas participated in summer labor at the Klawock fishery, and continued after the building of a cannery in 1878. Visitors to Klawock in the 1880s noted that the Haida had a separate village away from the Tlingits and the cannery. In 1886, the sockeye salmon resources of the K`iis Xaadas were brought into commercial development when James and Alec Miller established a saltery at Hunter's Bay with the assistance of families from Klinkwan. In 1896, the Millers interests were purchased by the Pacific Steam Whaling Company who built a cannery about a mile east of Klinkwan village. This set in motion an era of intense commercialization and competition from Euroamerican canneries and salteries that utilized destructive harvesting methodologies which led to the degradation of sockeye salmon populations (Langdon 1977; Moser 1899). When US Bureau of Fisheries official Jefferson Moser traveled through K`iis Xaadas territory in the late 1890s, Haida leaders came to him to inform him of the depredations to the sockeye salmon systems and to object to the harvest techniques that the cannery men were using (Moser 1899). More detail is provided on the nature and impacts of the early commercial salmon fishing activities in subsequent chapters.

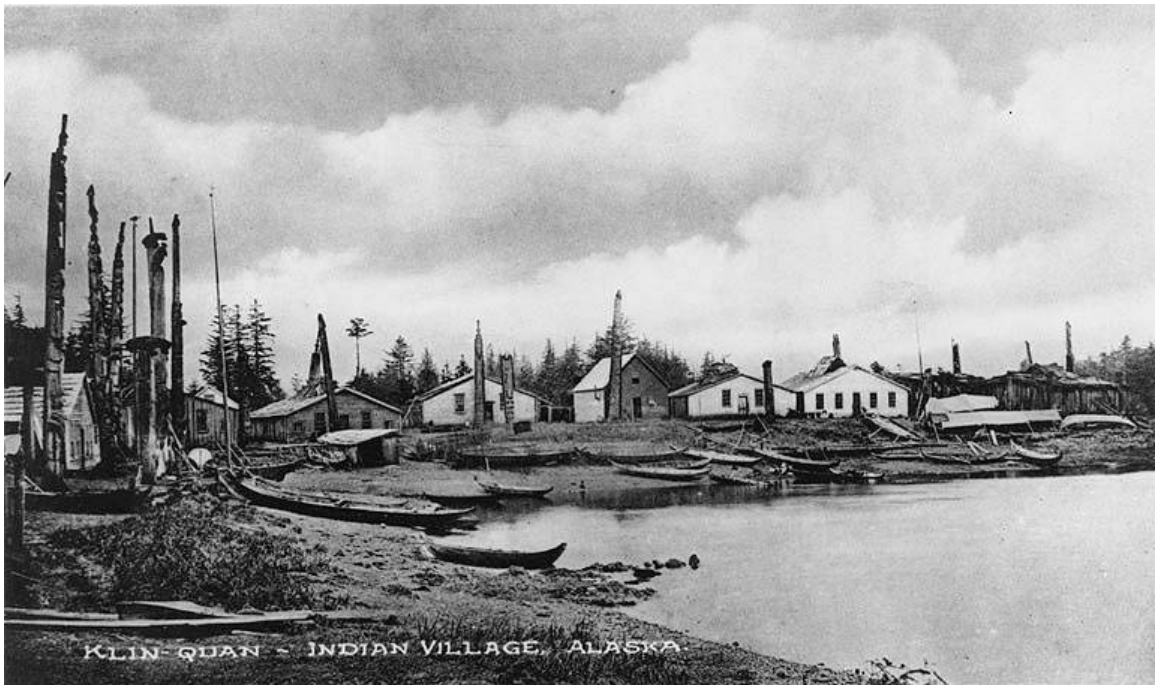


Figure 7 Klinkwan in the late 19th century

Establishment of Hydaburg
In the second decade of the 20th century, officials of the Bureau of Education promoted the consolidation of the K`iis Xaadas residents from the four villages into a new village, known as Hydaburg. The primary population movement associated with that re-settlement occurred in 1912; however over the next decade population relocation eventually resulted in all of the younger generations moving from the traditional villages

to Hydaburg. A reservation was established by executive order in 1912 however it was subsequently seen as a possible impediment to movement and further economic development and was abolished at the request of Haida leaders in 1927. In association with the establishment of the new community, Charles Hawkesworth organized the creation of a petition requesting US citizenship stipulating that the K'iis Xaadas would abandon their traditional language, social system, religion and ceremonial practices. The document was signed by 28 adult K'iis Xaadas men (Vaughan 1985:162) . Their expectation was that through this renunciation, they would become citizens of the United States according to the requirements of Alaska territorial legislation passed in 1915.

The establishment of the consolidated village heralded a new era in K`iis Xaadas history as many of the people envisioned a "new and better life" as American citizens and sought to unify and create a "solidary" community to undertake new developments. A cooperative store, sawmill and dock were constructed (Vaughan 1985). In 1927, Hydaburg was the first village to incorporate in the territory as a municipality, and in 1936, the Hydaburg Cooperative Association was formed, the first Indian Reorganization Act (IRA) council in Alaska. The village took out loans through the IRA to build a cannery, which began operations in 1939 and to expand the fishing fleet. However, throughout this period they were faced with intense economic pressure from an already established commercial salmon industry that was using capital intensive floating fish traps, positioned at key locations under federal license to harvest salmon which they did cheaply and efficiently, too much so for the tastes of the K'iis Xaadas (Langdon 1977; Vaughan 1985).

The fish traps required major adjustments by the K'iis Xaadas to be able to participate in the commercial salmon industry and make a living in their traditional territory. K'iis Xaadas fishermen as early as the mid-1920s had already taken their fishing boats out into the Pacific Ocean waters west of Dall Island to find locations to intercept salmon before they got into the inside waters. Traditional knowledge of salmon movement down the coast of Dall Island was certainly an aide in the development of these new salmon fishing grounds. Figure 8 shows a K'iis Xaadas vessel making a purse seine set off of Dall Island around 1925.

Efforts to establish reservations

As a small, poor and isolated Alaska Native village, Hydaburg was limited in the resources it could marshal to assert and protect traditional economic and subsistence rights in the face of powerful commercial and governmental interests. Nevertheless, its well-educated leadership maintained a pulse on various national developments and as noted above, were the first to establish an Alaskan Native IRA. They didn't stop there. In 1939, the village petitioned the federal government to establish a fisheries reserve for them based on a claim to aboriginal territorial rights. Figure 9 shows the area which they sought to have declared a Hydaburg aboriginal fishing reserve in order to ban fish traps. This comprises around 800,000 acres which would have included waters out to 3000 feet from shoreline, interestingly the same water boundary which defines the Metlakatla

Figure 8 The vessel "Bertha" captained by Boyd Nakatla (in the hat by the winch) hauling salmon aboard with a purse seine off Dall Island around 1925. Woodrow Morrison, about twelve years old at the time, is in the skiff pulling on the net. Photo courtesy of Woodrow Morrison.

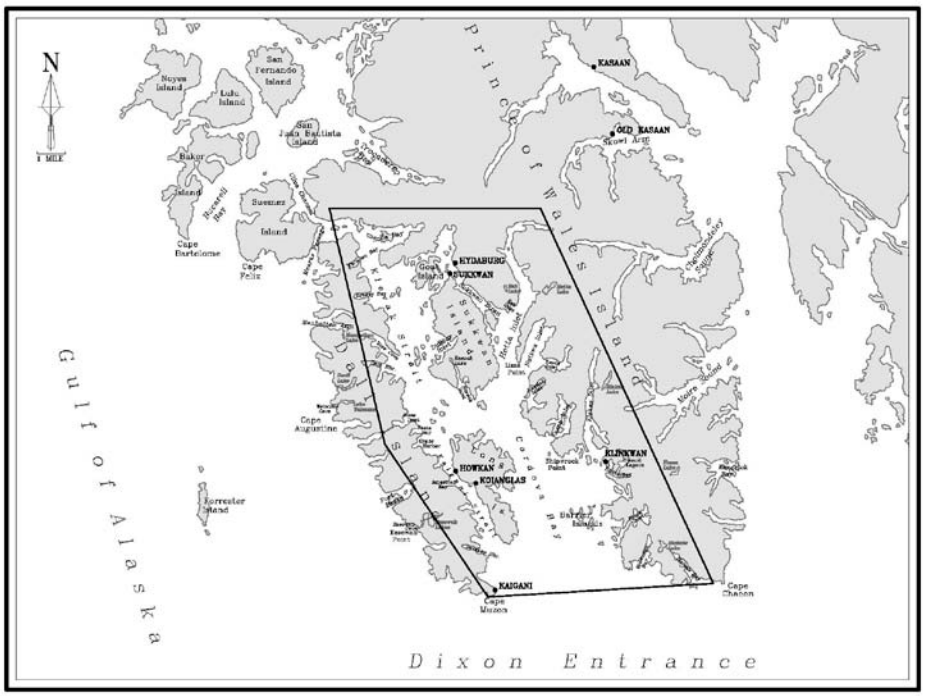


Figure 9 Tribal fishing reserve requested by the Hydaburg Cooperative Association in 1939. Source: Vaughan 1985:245

Indian Reservation of the Tsimshian Indians. While they were unsuccessful in their attempt to create this fishery reserve, Secretary Ickes of Department of the Interior opened the door for Alaska Natives to petition for reservations in 1941.

In 1945, Secretary of Interior Ickes determined that the Hydaburg Haidas held unextinguished aboriginal rights to approximately 10% of the total land and water they had claimed. Following Judge Hanna's logic and ruling, the remainder of the claim was rejected due to either the establishment of other claims that took precedent (mineral claims), from abandonment, or failure to object to use of the resources by whites. Nevertheless Ickes' successor Julius Krug, after an affirmative vote of a substantial majority of Hydaburg Xaadas residents, signed an order in November 1949 establishing a reservation, including water rights, of 101,000 acres for the Hydaburg people. Hydaburg residents were frankly disappointed due to the small size of the reserve and the fact that it in no way provided a base for the commercial or subsistence economies of the village. A subsequent court case brought by the Department of Justice to cause the cannery operators to cease operating their traps inside the boundaries of the Hydaburg reservation led to court ordered revocation of the reservation as illegally formed in October, 1952. Figure 10 shows the lands and waters claimed by the Hydaburg Haidas in 1941 and the lands where aboriginal title was deemed by Judge Hanna in 1945 to be unextinguished.

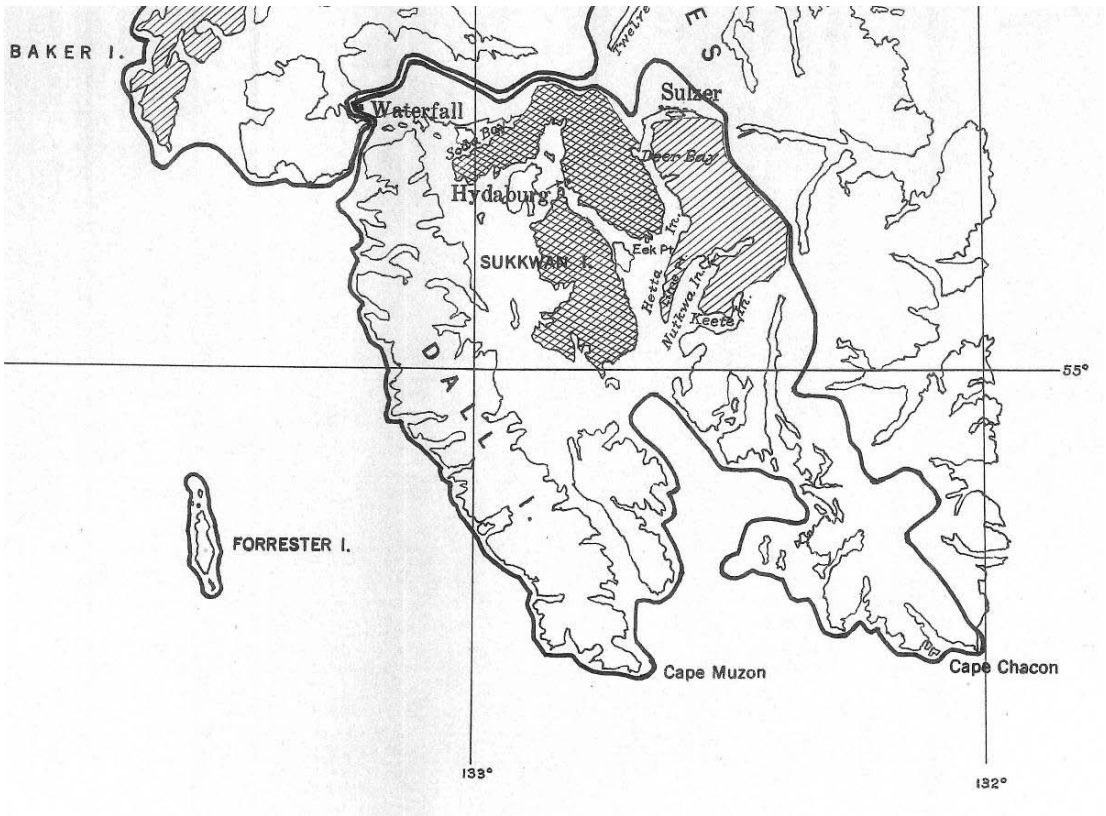


Figure 10 Lands and waters formally petitioned for determination of aboriginal title by the Hydaburg Haidas in 1941. The cross-hatched area are the lands that Judge Hanna determined in 1945 where unextinguished aboriginal rights continued to be held.

Changes in K'iis Xaadas salmon subsistence utilization
While K`iis Xaadas were involved at the beginning of the development of salmon commercialization in southeast Alaska, they continued their direct utilization and dependence on the various salmon streams from that time down to the present. Claude Morrison (2007) commented that after moving to Hydaburg, he recalled that as a child in the 1910s, K'iis Xaadas families generally made greater use of pinks, dogs and cohos with relatively few families traveling to their lineage owned streams for sockeyes.

George Haldane (USDOI 1944) recalled seeing the first independent internal combustion engine powered boat in the area in 1909. Ownership of such a vessel was seen as freeing Haida fishermen from cannery control and were energetically sought and rapidly adopted by the K`iis Xaadas. The new vessels allowed for greater mobility such that families could now return to traditional grounds or travel to other fishing systems. No longer were stream owner's rights being asserted or recognized. By the time of World War II, all Hydaburg Haidas were essentially using the streams of their region communally for subsistence purposes. Purse seine vessels would transport families or groups of families to sockeye streams and beach seines would be used with large power skiffs to harvest sockeyes in nearshore waters. The fish would then be transported back to Hydaburg where they would be processed in smokehouses and on stoves to produce various products.

By the mid-1920s the widespread adoption and use of the new fishing vessels in conjunction with the season and labor requirements of the canned salmon industry ushered in changes in K'iis Xaadas salmon subsistence patterns. Robert Sanderson indicates that people went primarily to Hetta and Eek beginning in mid-June in order to catch and process sockeye salmon by early to mid-July. The commercial salmon season would normally open toward the end of July when the adult and teenage men would go commercial fishing and the women would work in one of the canneries in the area. This would continue until the season concluded at the end of August. The older population would work on pinks and dogs obtained locally from Hydaburg Creek. Following the close of the season, subsistence activities would resume in early September on cohos and dog salmon, mostly from streams in the vicinity of Hydaburg. This pattern was followed well into the 1980s when the near disappearance of the local salmon fleet due to the sale of limited entry purse seine permits and the closing of the canneries created great economic hardship and necessitated new patterns.

Over the second half of the 20th century, several technologies emerged that led to new patterns of use. One technology was the emergence of increasingly high-powered outboard motors for open skiffs which replaced the large purse seine vessels as the primary means of transportation. With these vessels, K'iis Xaadas were able to quickly reach Hetta, Eek and on occasion Kasook. However, distance, weather, and uncertainty of harvest apparently kept the Klakas and Hunter's Bay systems from becoming major sources of subsistence sockeye. Relatively few families used these systems even in the 1970s for subsistence sockeye. A second technology that appeared was the freezer which allowed a new type of product, fresh frozen, to be added to the mix of products and was a major factor in reducing the numbers of fish that were hard smoked and dried. Changes

in taste noted as early at the 1940s by Haida witnesses at the Hanna hearings and the availability of store bought foods also led to some reduction in the overall level of salmon consumption. By the 1980s, tastes and cultural values had shifted such that sockeyes became seen as a primary source of subsistence salmon.

Sockeye salmon are now seen as the primary subsistence salmon food for most Hydaburg residents. The lack of availability of sockeyes from Hetta and Eek in 2002 and 2008 led to several types of adjustment. The first adjustment was for certain fishermen to look to other less utilized systems, notably Kasook, Klakas and Hunter's Bay for replacement sockeyes. Others shifted to cohos. Robert Sanderson reported a sizable increase in the harvests of coho from Hydaburg Creek in 2002 and 2008 which, however did not fully replace the foregone sockeyes. Another adjustment was to utilize more non-salmon fish, notably halibut, and deer while a final adjustment was to depend more on store bought food. The extraordinary harvest levels, requiring enormous amounts of labor which occurred in 2000 in association with the large return at Hetta certainly demonstrates the continuing significance of sockeye salmon to the food security of the K'iis Xaadas of Hydaburg.

IV. TRADITIONAL ECOLOGICAL KNOWLEDGE

This section summarizes traditional ecological knowledge information obtained from historic documents, Haida witnesses at the Hanna hearings and information obtained from K'iis Xaadas elder/experts during interviews with them about salmon and sockeye salmon that can be classified as traditional ecological knowledge. Traditional knowledge refers to the corpus of information acquired from elders, from other residents and from personal experience by persons, typically members of indigenous groups, who have been raised in households and places where cultural ties to resources are multigenerational. Traditional knowledge includes myths, narratives, accounts and observations that provide the person with a variety of information including the nature of organisms and relations among them, as well as the means to acquire and utilize various resources. As ecological knowledge it may include statements and observations about a variety of organisms, conditions, circumstances, and events related to natural ecosystem processes. Knowledge obtained as a result of personal experience and observation can be considered as local knowledge embedded within traditional ecological knowledge.

K'iis Xaadas Elder Interviewees

Six K'iis Xaadas elders were interviewed for this project using the protocol found in Appendix I at the end of the report. All six reside in Hydaburg, Alaska. The six interviewed are:

Francis Carle (known as "Amps"). Born in 1934 in Craig, Alaska. His mother was from Masset, a Haida village located on the north shore of Graham Island in British Columbia. He has resided virtually all of his life in Hydaburg. His primary occupation was as commercial fishermen in the southeast salmon purse seine fishery. He has and continues to participate in the subsistence harvest and production of sockeye salmon with his family and is known as one of the community's major producers.

Claude Morrison (known as "Meijou"). Born in 1910, Mr. Morrison was the first person born in the newly created village of Hydaburg. Mr. Morrison is a member of the Yakulanaas lineage. His family resided in Klinkwan prior to the move to Hydaburg. He has resided in Hydaburg all of his life. His primary occupation was as a commercial fisherman in the southeast salmon purse seine fishery and he has and continues to participate in the subsistence harvest and production of sockeye salmon with his family.

Woodrow Morrison. Born in 1913 in Hydaburg, Mr. Morrison is a member of the Yakulanaas lineage. He is the younger brother of Claude Morrison. He has lived the majority of his life in Hydaburg. His primary occupation was as a commercial fisherman in the southeast salmon purse seine fishery. He participated in the subsistence utilization of sockeye salmon throughout his life.

Harris Natkong, Jr. Born in 1931 in Hydaburg. Mr. Natkong comes from the Bullhead House of the Quetas lineage. His family background comes from the villages of Howkan and Sukkwan. Mr. Natkong has resided in Hydaburg for the majority of his life. He began working as a crewman aboard his father's vessel as a teenager and continued

commercial fishing as his primary occupation as a young adult. He has participated in the subsistence harvest, production and consumption of sockeye salmon throughout his life.

Anna Peele (maiden name Natkong). Born in 1922 in Hydaburg, Mrs. Peele is a member of the Tlingit L'eeneidi (Raven Dog Salmon) clan. Her family resided in Sukkwan prior to their relocation to Hydaburg. Her father and husband were commercial fishermen during their lifetimes. Her father was from the family considered the traditional owners of Eek. Mrs. Peele has participated in the processing of sockeye salmon for subsistence use since she was a teenager.

Robert Sanderson. Born in 1928 in Craig, Mr. Sanderson is a member of the Yakulanaas lineage. His mother was raised in Howkan and resided in Klinkwan after her marriage and prior to their relocation to Hydaburg. Mr. Sanderson has resided in Hydaburg all of his life except for the period of his collegiate education and military service. His primary occupation has been as a commercial fisherman during his lifetime. He has participated in the subsistence harvest and production of sockeye salmon throughout his life. Mr. Sanderson is widely recognized for the depth of his knowledge concerning the fisheries, waters and resources of K'iis Xaadas territory. TEK information provided by Mr. Sanderson on specific streams is provided elsewhere in the report.

Xaadas relations with salmon

MYTHIC TRADITIONS: WRITTEN AND ORAL

At the core of traditional existence for Xaadas were the cosmological beliefs and principles which structured practices and behavior. A fundamental principle of that cosmological core was the essential "personhood" of other entities and following from that the necessity of positive relationships in order to sustain human life and the lives of other entities crucial to human existence. As "persons" salmon (for example) are sentient, attentive and volitional – they communicate to us by their actions and observe our behavior toward them. As with relations among humans, respectful engagement that values and honors others is essential to sustaining relationships. Perhaps most importantly, human ritual behaviors are crucial to the recycling and return of the salmon from their home villages under the ocean to this existence. Mythic accounts establish these basic principles which can be termed "relational sustainability" (Langdon 2004, 2006, 2008).

Written Versions

The Haida share with other societies of the northern Northwest Coast region (Tlingit and Tsimshian) a quite similar account referred to as the "salmon boy myth." Swanton (1905, 1909) provides two different versions of this account, one from Skidegate and one from Kasaan, the Kaigani Haida village on east side of Prince of Wales Island.

The Skidegate version, entitled "Mouldy-Forehead", has a young man taken off by the "Salmon-People" to their offshore home following his refusal to eat a piece of dried dog salmon given to him by his mother (Swanton 1905:197). When he was in the village of

the salmon souls, he learned that after eating a salmon, he was to place all of the bones back in the fire. He was told that if he failed to do so, the salmon would become sick in the location of the missing bone. He then embarked on a trip back to his home with the other salmon and presented himself to his mother for harvest. After capturing him, she cut him open only to discover a copper necklace that she recalled her son wearing at the time of his disappearance. The salmon-boy was placed on the roof and the rain washed off his salmon-skin restoring him to human form. Following that he became a great shaman. Later he speared a white salmon jumping in the river and died instantly, having speared his own soul. Then his relatives "dressed him up, and let his body fall to the bottom of a hole in the salmon creek, up to which the salt water came" (Swanton 1905:197).

At Kasaan, the story is entitled with the Tlingit name of the salmon-boy, who is the central character in the account (Swanton 1905:243). In this version, the boy receives a moldy piece of salmon on several occasions which he threw back each time. Then, while swimming in the water with other children, he got in too deep and drowned. He was wearing a copper necklace at the time. But the Salmon-People took his soul to their town where he saw that the salmon "had bodies like ordinary people." Then he was shown where he could get salmon to eat. After he did so, he heard one of the children in the house next door crying. An old woman from the house came and asked if he had dropped any part of the salmon on the ground without throwing it into the stream. She told him to go back and see if he had left an eye on the ground. If he found it, he was told to put it in the water. When he went back he found the eyeball and threw it back in the water. When he returned to the village, the pain in the child's eye had disappeared. Sometime after he accompanied the salmon on their return trip to land encountering herring on their way back. He noticed that as the Salmon People stood up in the canoe, they were actually jumping. He eventually spotted his mother and stood up for her to see. But she couldn't catch him at first so "his mother …made a wall of rocks about herself, inside of which he fell and was killed" (Swanton 1905:244). When she then began to cut the salmon-boy open, her knife struck a piece of copper around his neck. She recalled that her son had been wearing such a piece at the time of his drowning. They decided to place the salmon on a mat and put it on the top of the house. The father observed that a human head was beginning to appear and after six days of ritually consuming saltwater, the boy emerged completely, discarding his salmon skin. After further ritual performance, the boy was transformed into a shaman. Later on the village people observed a beautiful, translucent salmon in the river at a time when all the other salmon were dead and dying. They were unable to catch it. The shaman, however, threw a sharp stick at the salmon, striking it in the head and killing it. At once he fell dead too. Prior to his death, he told the people to dress him up in his shaman regalia and place him in the deep water hole turning him around four times before letting him go. They then placed his drum and striker into the hole. He announced that if they were to hear noise from that place, that some misfortune would soon occur (Swanton 1905:243-245).

In both of these versions, the underlying "personhood" of salmon is revealed and instructions on how to treat salmon are given to the young boy by the Salmon-People. When those instructions are not followed, pain (and therefore disrespect) is inflicted on a

salmon person. Also demonstrated is the principle of shamanic transformation through which critical knowledge is passed to humans about their relations with salmon. Intriguingly, but ambiguously, the deep hole in the stream is positioned in both accounts as the location in which the deceased shaman was placed following death.

Oral Versions

One of the initial questions asked of the elder/experts during the TEK interview was to provide an account of what they learned about salmon from their parents and relatives. If the "salmon-boy" account was not given, a specific follow-up question was asked to prompt a perhaps overlooked memory. Of the six elders interviewed, only one provided an account of the "salmon-boy" story. Anna Peele (2007:15) gave the following account:

> "The only story I ever heard was the boy who turned into a dog salmon. The … part I remember is where the boy gets hungry and he was snaring seagulls and he got hungry so he went to his mother and told them he was hungry. The mother said "in the box over there, there's a piece of dried fish" so he went to get it and it was moldy. He laughed about it and he threw it back in the box and didn't want to eat it. When he went back to his snares he had a seagull on his snare and the seagull started flying away with it, and he started chasing it, and he fell off a ledge, and that was the last time they saw him. They couldn't find him or anything but they found his snare floating in the water, and then later when the salmon were going up the creek, he was caught in a net, and his mother was just ready to cut his head off when her knife hit a metal. She looked and she recognizes he had neck piece, that salmon had it on, so I don't know what happened to him later. And then one story I read, they caught him in a trap where the water went in and out, and they kept him in there until the fish skin came off. Then he became normal."

Mrs. Peele reported that she had been told the story as a child by her mother's grandfather, Sukkwan Bob, who had continued to live in his house at Sukkwan, across the strait from Hydaburg, after the new village was founded. She had been told the story in Haida.

The template for K'iis Xaadas life, as discussed in the background section, was dramatically altered in the period between 1890-1920 by the impact of Christianity, education and loss of power over local resources. Traditional language and culture were to a substantial extent devalued until well into the second half of the 20th century. However, a gradual revitalization, now strengthening and growing, of interest in traditional culture and language led to some of the elder women, notably Helen Sanderson and Esther Nix, coming to the school to revive cultural knowledge and teach the stories they had learned as children in the 1880s and 1890s. Tony Christianson provided the following two examples of stories he was taught as a child in the Hydaburg school in the early 1980s:

> "When I was in school, Haida elders Helen Sanderson and Esther Nix told us a number of stories about salmon. In one, a young boy spit on a piece of moldy salmon and then he walked out of the house and went down onto the beach. He met two boys on the beach and they took him out in the ocean to a village where

> he stayed and learned that salmon were like people and did all the things like people, potlatching, making poles. Eventually he left with the salmon people on a long journey. After some time, they went up a long narrow channel and he saw his mother on the shore. He started jumping in front of her to catch her attention. Finally he was caught by his mother. When she went to cut his gills, she noticed that embedded in them was the same sharpening stone that she recognized her son had when he left the house at the time he disappeared. She called to her husband and told him what she had found. They asked a shaman for advice and he told them to hang the salmon up high in the smokehouse. Overnight the skin slid off the body revealing that it was the boy. However he did not survive.
>
> In another story, the boy was taught all the appropriate procedures for showing respect – for caring for the fish, cutting it, cleaning it, smoking it and storing it so it wouldn't get moldy. When he was done he was told to take all the parts that hadn't been used, like the insides, bones, head, fins and tail and bury them in a hole in the ground. The next time he caught a salmon the boy tried to follow all the directions he had been given. When he buried all the remains, however, he missed one of the eyeballs. Soon after that, his eye became very painful and began swelling. He asked his parents what was wrong. They asked if he had taken care of the salmon the way he had been told. He thought about it and remembered that one of the eyeballs had been missing when he put the head in. So they went down to the site and looked around and found the eye. Then they dug up the hole again and put the eyeball in with the other remains. Then his eye got better" (Christianson 2009).

These two stories correspond very closely to the salmon boy myths that were taken down by Swanton in 1900. Salmon boy stories have now entered the formal training of K'iis Xaadas children and are taught as part of the cultural curriculum of the Hydaburg School District.

Forms of respectful behavior

A critical activity in the structure of northern Northwest Coast cultural practices built on reciprocity and the fulfilling of obligations to opposites is joyful welcoming when at the time of arrival to special events. Arriving canoe loads of guests were always energetically welcomed with song and carried ceremoniously ashore. Because salmon are "persons" traditional practice includes a formal joyful and thankful welcoming upon the arrival of the first salmon as described by Henya Tlingit elder Clara Peratrovitch (Langdon 2006:113). While no Xaadas elder described such practices, there is one behavior that would appear to have its roots in traditional welcoming behavior. Francis Carle (2007) commented:

> "…being a fisherman I always say Iyoo when I see that little humpy jump. Well when we say 'Iyoo' that means that was a salmon that jumped."

The welcoming cry upon seeing a salmon jump harks back to the salmon boy myth which always makes it clear that salmon jump as they near their home stream both to see where they are going and to make their presence known to the humans. The welcoming cry by

the modern Xaadas who spies a jumping salmon may be founded in that practice but now is a form of excited communication to others about the presence of salmon. The practice is also common when subsistence fishing as I heard it repeatedly used during our field observations when a salmon jump was spotted. Excited intensity can be heard when sockeyes are observed jumping when Xaadas men were preparing to make a set to capture the salmon for subsistence use.

There are a number of additional principles for the use of salmon that could have there roots in traditional spiritualized practices but are now more founded in material as opposed to spiritual pragmatics.

A first principle of this kind articulated was that of limiting harvests to what was needed. Francis Carle (2007: 21) stated:

> "I think that a lot of times your folks tell you in your own way not to get too much of anything and they teach you to take only what you need and a lot of times you take what you need."

Carle (2007: 21-22) went on to note that what was "needed" maybe more than that required for a single family or even an extended family living in Hydaburg:

> "And a lot times we take a lot more than that [household/family use] because there are people that can't get subsistence. A lot of people that are Haidas but they don't live in Hydaburg but live in places like Seattle and Anchorage some place where they can't put up stuff like that. Then we take a little bit and send them some."

While there are obligations, moral and cultural, to assist those in need, the expectation is still that human harvests should taken into consideration the need for salmon stocks to have sufficient escapement for return.

A second principle related to respectful treatment is to handle the caught salmon carefully and insure that processing occurs as completely and fully as possible so that none are wasted. To that end, Claude Morrison (2007:9) stated:

> "You were supposed to handle real careful so you don't break up the meat; you don't throw them when it hits hard it just gets mushy like."

A third principle was to carefully process the salmon harvested to insure the quality of the fish. Claude Morrison (2007:9) stated:

> "You have to be very careful the way you handle your salmon, the way you put them up."

This imperative relates to quality of the product that is the result of the processing.

Names for salmon species and salmon parts
Claude Morrison provided the terms and Benjamin Young the orthography for Haida terms for commonly recognized salmon as presented below:

Table 2
Salmon Names: Haida, Common English, Scientific

Haida	Common English	Scientific
Sgwáagaan	Sockeye, Red	*Onchorynchus nerka*
Sk'ág	Chum, Dog	*Onchorynchus keta*
Táay	Coho, Silver	*Onchorynchus kisutch*
Táa'un	King, Chinook	*Onchorynchus tsawytscha*
Ts'at'áan	Pink, Humpy	*Onchorynchus gorbuscha*

The following Haida terms for salmon body parts and features were provided by Claude Morrison and Anna Peele; Benjamin Young provided the Haida orthography.

Table 3
Haida names for salmon body parts, features and life stage

st'áay --- tail
ts'il --- fins, gills (Claude Morrison – term is the same for both because it refers to what is being cut off the fish)
kún --- nose
xáangii --- eye
ts'ild --- backbone
cháay --- eggs
tl'ak'wul --- milt
k'uug --- heart
sdláan --- intestines (referring to the insides of fish)
kíits --- stomach
hlk'ut'uu --- fish slime
t'ung --- sea lice

Some names of parts for fish are the same terms as are used for the parts on humans and other biological organisms(viz. nose and eye).

It should also be mentioned that Xaadas salmon terminology includes concepts for life stage – specifically the term ka'was means red fish in reference to both sockeye and coho salmon which turn red after they have been in freshwater and are near death.

Salmon stream habitat concept
Deep pools in streams were recognized by elder/experts as important types of habitat where salmon schooled and rested on their way to their spawning grounds. They were also recognized as being locations where cohos could be found in the winter if one was desirous of fresh fish. Claude Morrison (2007) provided the following Xaadas term for these locations: *gyak'hldii ńaas* . He translated the term as "where the fish lay" or "where it is deep."

Tony Christianson (2009) provided the following account of his understanding of a concept which appears to be related to Mr. Morrison's which he pronounced as "gii ly":

> "As a child my uncle, Jeff Peele, took me up Hydaburg Creek. He showed me various salmon pooling areas. When we reached about half a mile from the mouth, there was a large pool which he called a 'gii ly.' I came to know 'gii ly' initially as a fishing hole and later as a deep hole where salmon and trout rest. Going further up Hydaburg Creek there was a second 'gii ly' that was similar to first – a deep pool with lots of woody debris on the shore. While there are other deep holes where salmon rest while ascending the stream, they were not termed 'gii ly.' The characteristics of a 'gii ly' is a hole above an ascending rapids and below a shallow spawning area. The first 'gii ly' is no longer there due to a washing out of the logs that created the pool."

Claude Morrison (2007: 18) made the following remark about salmon instream behavior in association with debris in the stream:

> "One thing that I know … is when we were kids when the steelhead used to come in we used to go up the creek all the time to look for steelhead, under stumps and under logs. and I never noticed [a fish] where a fresh tree falls. And I never noticed the salmon underneath it [either]."

Traditional Territories
In 1944, the Hydaburg (K'iis) Xaadas filed an assertion of aboriginal rights to the lands and waters of their customary and traditional territories with the US Department of Interior (USDOI 1944). The claim was filed as a protest to the federal government allowing and permitting fish traps owned by corporations and other non-Xaadas to be established in their territory which disrupted their abilities to obtain fish including salmon, halibut and black cod. As part of their petition as "Indians of Hydaburg, Hydaburg, Alaska", they stated that they had "never sold, ceded, relinquished or abandoned any of [their] described lands and waters" (USDOI 1944).

According to an exhibit submitted in support of the Hydaburg petition for findings concerning aboriginal title to lands and waters, tribal territory was traditionally organized according in the following manner and stated that;

> "These claims have been handed down to the present date [1944] in the order they are listed:
>
> 1. Beginning at the north shore of Tlevak Narrows including Soda Bay to Halibut Nose is claimed by John High.

2. The district from Halibut Nose through North Pass including Hydaburg Bay, South Pass, and Sukkwan Strait to Eek Point is claimed by two parties, John Wallace's family and the family of the Nix's and Natkong's.
3. The district from Eek Point to Lime Point including Hetta Inlet was claimed by Mose Koolkeet, a descendant of the group that crossed the portage at Sulzer. He is now dead and the place has no claimants.
4. From Lime Point to Hassiah Inlet including Nutkwa Inlet and Keete Inlet is claimed by Ben Duncan and Robert Cogo.
5. Hassiah Inlet, Mable Bay, Kassa Inlet to Shipwreck Point was considered common property. Further explanation for this being that there are no real good salmon streams in this district.
6. From Shipwreck Point south to Klinkwan including Klakas Inlet was claimed by Edwin Scott whose descendants are Lloyd Scott and Katherine Young. During the life of Edwin Scott this claim was recognized by early cannery men and money was paid to him for the use of his streams.
7. Hunters Bay was claimed by Alex Peele whose descendants are Clarence and Morris Peele.
8. Tah Bay was common property.
9. Hessa Inlet was claimed by an old Indian by the name of Bill Okeet. He has died and there are at present no claimants.
10. From Point Marsh to Cape Chacon was common property, which can also be further explained by the fact that it is very rough and rocky country.
11. From Cape Muzon going north on the east side of Dall Island to Grace Harbor was common property, which can be explained by the fact that the Howkan was a village of sizable proposition and all land adjoining was considered common property.
12. Grace Harbor, Vesta Bay, Rose Inlet, View Cove, Breezy Bay and Fairlawn Bay are claimed by Matthew Charles. The large amount of territory may be explained by the fact that he is the oldest living descendant and patriarch of the clan.
13. All the rest of the territory was common property for all to use."

Traditional salmon system ownership

Within the traditional territories described above, a number of sockeye salmon streams were of major significance to the K'iis Xaadas. Another of the exhibits submitted in the City of Hydaburg's petition for a determination of aboriginal rights stipulated the following concerning the ownership of salmon streams:

> "In 1911 all [sic] the residents of Klinkuan, Howkan, and the few remaining at Sukkwan, moved to and built the present town of Hydaburg. They still held their rights to their fishing streams, which as follows:

Alec Peele	Hunters Bay
Edwin Scott	Klakas Inlet
Ben Duncan	Hessiah Inlet, Nutkwa and Keete Inlet
Moses Kolkeet	Hetta Inlet
John Wallace	Sukkwan Strait to Eek Point
Matthew Charles	Rose Inlet, View Cove, Breezy Cove and Grace Harbor

> These were all recognized as just and lawful possessions of the families mentioned above. Other fishing sections were considered as common property for all to use."

There are other documents in which "ownership" of sockeye salmon systems by K'iis Xaadas is stipulated. In general, the pattern noted above is generally followed but there are some differences. In regard to sockeye salmon systems, one notable difference from the above listing is that offered by Paul Morrison at the hearing in 1944 who testified that his uncle, Cogo, was the owner of Nutkwa who received payment from the whites for fish from his stream (USDOI 1944). If Ben Duncan was the nephew of Cogo, he perhaps became the owner of the system based on the traditional pattern of matrilineal inheritance. In addition, at the present time, it is generally asserted that Frank Natkong was the last recognized owner of Eek (R. Sanderson PC) and Mrs. Peele likewise affirmed that her father was considered the owner of Eek by others (Peele 2007:8).

While the above statement constitutes the formal principles of K'iis Xaadas ownership, it was common for other Xaadas to utilize the streams through relationship or explicit authorization. It should also be noted that: "These facts were obtained from interviews of the older people in town particularly John Wallace and Matthew Charles."

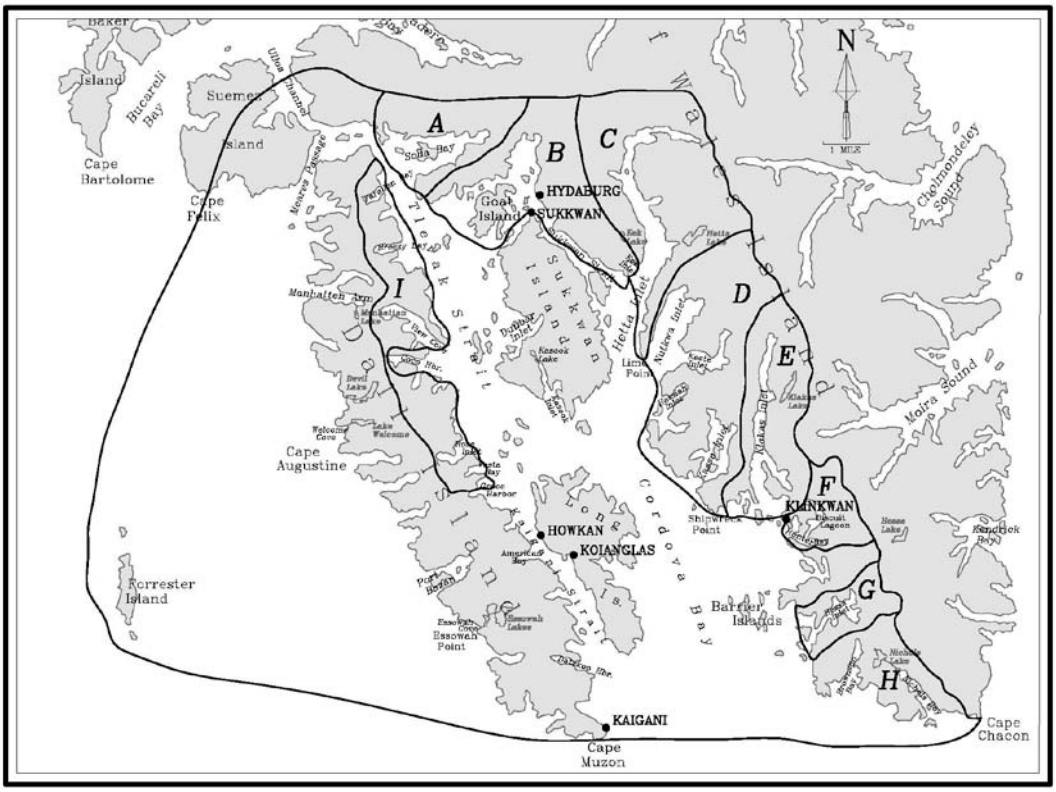
Owner/Trustee Rights and Responsibilities

Traditionally, it is reported that lineages house groups acted as the production unit traveled first to their own sockeye streams where they dried salmon. Only those with kinship rights or authorized by the owners were able to use specific streams. While several house groups might be found at a particularly productive location, such Hetta or Hunter's Bay, other smaller systems, such as Kasook or Eek might have only one house group. After completing sockeye production the house groups would further subdivide, perhaps to the extended family level.

There are no discussions in the literature about how a stream owner operated, that is what kinds of rules and activities were associated with that ownership. One piece of tantalizing testimony was provided by Frank Nix at the Hanna hearings. Concerning Moses Kolkeet's practices as stream owner of Hetta, Frank Nix (USDOI 1944) was interpreted to state that:

> "..his uncle showed him how to fasten these sticks together, and without his saying nobody could go out there and get the fish. He had to o.k. first before somebody else could get the sockeyes."

Nix's statement makes reference to establishing a point-to-point line from the location where Kolkeet had his camp on the point at the south entrance to Hetta Inlet to a landmark on the opposite shore. Only fishermen from canneries who had paid the lease were allowed to fish inside that line. These practices were in force from the late 1880s until the mid-1890s. Moser (1899: 78) states that when Hunter's Bay cannery began they refused to pay lease fees and therefore such payments and practices may have ceased in 1896.



Territory	Area	Sockeye stream	Size	Owner
A	Soda Bay	None	-	John High
B	Hydaburg Vicinity	Eek	Medium	Wallace, Nix, Natcong (Eek
C	Hetta Inlet	Hetta	Large	Moses Kolqueet
D	Nutkwa Inlet to Keete Inlet	Nutkwa, Keete	Small	Ben Duncan
E	Klakas Inlet	Klakas	Medium	Edwin Scott
F	Hunter's Bay, Biscuit Lagoon	Hunter's Bay	Large	Alec Peele
		Biscuit Lagoon (2)	Small	
G	Hessa Inlet	Hessa	Small	Bill Okeet
H	Nichols Bay	Nichols Stream	Large	Unknown - with Kasaan
I	Northeast Dall Island	None	-	Matthew Charles

Figure 11 K'iis Xaadas traditional territories and salmon stream ownership as reported in 1944.

Nix (USDOI 1944) indicated that Kolkeet had lived at his camp on the western point of entry into Hetta Bay and that the alignment began from that point. Robert Sanderson pointed out that Kolkeet was buried at the site of his camp and that a grave marker stood there for many years but had now fallen down. Sanderson suggested that the "sticks" were probably positioned in such a manner excluding fishing from the inner bay and requiring harvesting activities to take place only outside the lines. Figure 12 indicates two possible ways in which the sticks could have been positioned based on Sanderson's traditional ecological knowledge of Hetta Bay.

Given the significance of "Moses Kolkeet" and Hetta to the K'iis Xaadas the following information on the name was provided by Christine Edenso (nee Kilgeese), a half Haida and half Tlingit woman born in 1891 who spent her childhood growing up in Howkan. The quote below provides important historical context about the name "Kolkeet".

> "We'll now go to Xit'aa which belonged to chief Kuhlgiit. Moses Kuhlgiit and his house used to sit on a little fort islet there, right off from the bay. He had his smokehouse there and his residence. They were right next to each other, or they

Figure 12 Moses Kolkeet's camp and grave marker. Indicated at the entrance to Hetta Bay by the black arrow. The red lines indicate possible "stick" alignments used to close inner waters to fishing as suggested by Robert Sanderson.

> were connected to each other. He had held on to this land for a number of years. He was one of nine Kuhlgiit chiefs. At this time, there were probably six Kuhlgiiits who preceded him in title and who had possession of Xit'aa creek. …The fort islet itself belonged to Kuhlgiit and it was kind of a fort in the olden days. It was kind of a stronghold and he had his house and smoke house there. There used to be a lot Haidas who came to fish there in season; to seine in the great big seine skiffs" (Pulu 1983:32).

Traditional salmon harvesting technologies

K'iis Xaadas harvested salmon from a variety of contexts including oceanic saltwater, inside bays and inlets, estuaries, streams, lakes, and tributary streams. A variety of techniques were used to harvest the various species of salmon in these different contexts.

SALT WATER: TROLLING AND SPEARING

Salt water is the first place that returning salmon are available for harvesting. Frank Nix (USDOI 1944) stated at the Hanna hearings: "Certain clans claimed certain creeks, but the salt waters were open to all people—to all Haida people."

In salt water, two technologies were mentioned for taking salmon, trolling and spearing. King salmon was the only species that was mentioned as being harvested in salt water using the trolling method. K'iis Xaadas interviewees and Hanna witnesses were aware that king salmon did not go up any stream in their area but they were available at various times and locations in salt water. One location they were known to occur was on the outer coast of Dall Island, especially in the vicinity of Forrester Island. Kaigani Xaadas regularly traveled to Forrester Island in May and June for the harvest of seagull and other bird eggs which is the time in which king salmon are present in those waters. Hanna hearings witness Matthew Charles stated the following concerning locations where king salmon were taken:

> "…all over outside of Dall Island shore. All along that outside shore was the trolling grounds for king salmon, up around Noyes Island and around those places. In fact the best place for king salmon trolling at one time was Forrester Island" (USDOI 1944).

Frank Nix observed similarly:

> "Forrester Island was the only place that they noticed the most king salmon. All of his life he was out there – he was there all the time. That is, whenever it was necessary to go there, he would be out there with his people. When he was very young, he went out here for picking up eggs. They went in canoes" (USDOI 1944).

Trolling as a technique involves using a baited hook attached to a line that trails behind the canoe or skiff. The line is delicately attached to the side of the canoe with a small split stick that looks like a clothespin. The stick is carefully watched for movement to determine if the hook has been taken. The bait is intended to lure the king salmon to take the hook as they are feeding. When the hook is taken, the fisherman in the canoe then grabs the line and begins to play the fish by hand and hopefully eventually landing it. A similar technique was identified by Tlingit elders (Langdon 2006). The following

statement by Frank Nix describes a related form of trolling in salt water formerly used by K'iis Xaadas:

> "We fished for king salmon in olden days but we used different kind of gear to catch king salmon with, and different bait. …You know these cockles that you get on the beach? They are bent already, he says, in the shell. And when you get them out and you put them on a hook without a swivel, it swings, and that is the way that we used to fish for king salmon in olden days. It rides on the top of the water. They used a root spun into a line" (USDOI 1944).

The reference to Forrester Island as a site where king salmon trolling occurred is corroborated in federal documents (Bower and Aller 1915, 1917) and also by the personal experience of George Hamilton (Langdon 1977: 244). Bower and Aller (1917:40) reported that in 1915, the refuge reserve warden on Forrester Island issued 111 Native [Haidas and Tlingits] fishermen trolling permits.

While king salmon rarely are seen in large schools at the surface, the other four species of salmon are often observable traveling in schools of large numbers of fish on and near the surface of the salt water on their migratory routes back to their home streams. Paul Morrison commented that:

> "In the olden days when the fish comes, they school up all along everywhere, and they had a spear, a special spear, and they would go along and they would run into that school of fish and they would spear one, and they go fish for their lunch when they went ashore" (USDOI 1944).

The technology he describes, the spear, may be the same device that is pictured and discussed below in the section on in stream harvest. That spear could also be used in salt water as the manner in which the hook is attached to the shaft allows it to disengage when the hook is embedded in the fish. The line attached to the shaft would float free and the shaft would float. The shaft would act as a partial drag on the fish and allow the fisherman to pick up the shaft and then carefully haul in the salmon. Morrison's remark indicates this was an occasional activity done to obtain fish for a meal and not a technique that would supply large amounts of fish for processing and storage.

ESTUARIES: STONE TRAPS, WEIRS AND BASKET TRAPS

Salmon gradually but sometimes with great rapidity move through the bays and inlets toward their home streams. On occasion, they are found in large multispecies, multistream schools as they advance up Cordova Bay gradually breaking off into smaller streams as they travel the final distances to their homes. A critical habitat for the returning salmon is the estuary where in the mixing zone of fresh and salt water, the biochemical changes occur that set in motion spawning and subsequently death.

The estuaries and the shores near the mouth of the streams were a location for a different type of salmon harvesting technology. Two basic types of structures have been identified that K'iis Xaadas utilized in these locations. One technology is that of intertidal stone traps that were constructed in half-circle form with the open back of the trap facing the upland. These structures are typically found at the mid-tide level. They operate on the

principle that salmon schools, particularly those of pinks and dogs, will lie at the mouth streams waiting for freshwater conditions in the streams that will allow them to ascend. On the flood of the tide, the school will advance up to the high tide area, and some may ascend, but if conditions are not appropriate, they will then back out into the bay on the ebb tide. Langdon (2006, 2007, and 2008) identified these same structures operating in the Tlingit areas of the Prince of Wales Archipelago to the north of the K'iis Xaadas. The positioning of these structures in the mid intertidal zone, usually on one side of the estuarine stream means that they will not block salmon moving up on the incoming tide and are completely inundated and unobservable at high tide. They are able to capture salmon only during the first half of the outgoing tide; Langdon (2006) refers to this pattern as "tidal pulse fishing." Its genius lies in insuring that salmon have the opportunity to move into the stream and on to their spawning grounds on each high tide.

Hanna hearing Haida witness, Sam Davis commented as follows on stone traps:

> "You go down to the cannery and you will see rocks piled up into something like a trap. When the high water comes, the fish comes over them, and then when the tide goes out the fish are high and they are dry – they are high and dry, in other words" (USDOI 1944).

Christine Edenso, whose mother was Tlingit and father and husband Haida, traveled extensively in both the Tlingit and Haida regions of the west coast of the Prince of Wales Archipelago during her lifetime. She states as follows concerning the intertidal stone traps:

> "I've observed in my younger days that…Tlingits [and Haidas] used to trap fish at the mouth of the streams. If you go around today by the mouths of the old creek flats, you will see these rocks still piled up as they did in the old days. You will be able to see the outline of where they laid a bunch of rocks to form a wall. In that way, when the tide went out, the fish were trapped behind them and they were easier to catch then. They used to catch all the fish they needed as time went on. Some of the creeks were readily adaptable to this kind of fishing, and that was why they caught their fish by this method. The fish would go up to the mouth of the creeks at high tide. They would get behind the wall and would be trapped then the people would gaff them and pull up all the fish they needed right there. That was how they used to catch their fish. When you go along the beach low tides, you can still see these places where they made these rock walls and traps and they are quite visible. They are the works of the people a long time ago…You can see these rock enclosures all over Southeastern Alaska on the west coast, in the tidal flats…and at any place where there was a good number of people. … They used the network of fish traps to corral the fish momentarily while the tide was going out. They used to gather their fish in that way." (Pulu 1983:36)

Claude Morrison, Woodrow Morrison, Robert Sanderson, Francis Carle and Harris Natkong Jr. all reported observing intertidal stone traps at various locations in the area during their lifetimes. Francis Carle (2007:29) commented as follows on his understanding about intertidal stone traps:

> " I guess they had them all over. But the reason they don't work here is because they would take branches and stick them up like this all the way [around]. Then they would plunge in them. Then when all they fish would go in there they would block it off. The reason there was walls [was] if there was a lot if fish in there they couldn't spread out. [They] stayed right in, the walls kept [them] in. So the rocks were not only there to hold the branches up but to hold the fish in there."

Mr. Carle's comment about the trap not working "here" was in reference to a recent effort to recreate a stone trap on the beach below his house in the intertidal area on the north side of Hydaburg Creek estuary. The trap was also enclosed at the back toward the beach rather than being open as a semi-circle in the manner of traditional trap construction.

Mr. Morrison stated that the Haida term for these structures was "sk uum" which he translated into English as trap.

Locations where intertidal stone traps were reported or observed in K'iis Xaadas territory include:

Prince of Wales Island: Eek, Hydaburg Creek, Hunter's Bay, Keete, Saltery Creek
Dall Island: Grace Harbor, Coco Harbor
Sukkwan Island: Kasook

This is not an exhaustive listing as there are likely other remnant stone intertidal trap structures elsewhere in K'iis Haida territory.

In the section dealing with specific stream information that follows, descriptions of the structures identified during the field observations are provided.

Figure 13 Intertidal stone fish trap on the west coast of the Prince of Wales Archipelago. Seen about half tide on the ebb stage. Photo by John Autry

Figure 14 Intertidal stone traps at the K'iis Xaadas site in Kelly Cove on the southeast side of Noyes Island. The picture was taken at low tide. The arrow points to the stone traps which are observable as rock alignments. Photo by Terry Fifield

The other type of technology that was utilized in the estuaries are wood stake alignments which created weirs for funneling salmon most likely into some type of basket trap. This type of structure was most clearly identified in the intertidal estuary at Hunter's Bay but was also found at Nichols Bay. The arrangement of the wood posts at Hunter's Bay indicates that they comprise a diagonal foundation to which lattice walls were attached. While it is not entirely clear, it is possible that the structures when located in the estuary could also be designed to operate on the principles of "tidal pulse fishing" (Langdon 2006). The Hunter's Bay and Nichols Bay features are described in greater detail in the section below on information from specific sockeye streams.

STREAMS: WEIRS AND BASKET TRAPS AND SPEARING

Once they have migrated back into the streams, salmon species take different paths to spawning and death. Sockeye are the only species that require a freshwater lake as part of their lifecycle, a fact clearly understood by K'iis Xaadas TEK interviewees. The three other species which spawn in the streams of the area (chum, coho, pink) may or may not use a lake and possibly a tributary stream which flows into the lake. The K'iis Xaadas report using two methods for harvesting salmon in freshwater stream contexts. These were most frequently utilized in outlet streams for the sockeye systems but can be used in streams without lakes as well.

The primary system utilized in stream is likely to have been a modified form of the weir system discussed in the previous section used in conjunction with basket traps. These systems involved the placement of stakes driven into the streams beds at several foot intervals to which were attached lattice fences composed of wood slats bound together by root rope. The weirs thus constructed would divert the ascending salmon toward basket traps which were likewise composed of wooden slats bound together. These basket traps were place at various openings in the weir walls to which the salmon were funneled. These apparatuses were put in place in the spring based on the directions of the stream owner and then the weirs and traps were taken out at the culmination of the fishing season when sufficient quantities had been taken for processing. The foregoing description is based on information from Tlingit sources elsewhere in Alaska.

An eyewitness account of the placement and operation of two traps in a Kasaan Haida (east side of Prince of Wales Island) sockeye system is provided by James Swan who voyaged to Alaska in 1875. Swan visited Kasaan in 1875 and during his time there was taken to the Karta River where he observed salmon fish traps in operation. His description of them follows:

> "In the afternoon…went in the Dingy boat…up a small stream near Baronovitch's place to the salmon traps. A few Indian boys were at the mouth of the stream and my party went to visit them...After we had visited, we got into a canoe with two Indians who took us up the rapids to the salmon traps which are very carefully made and very effective. The form these traps is like the head of an arrow with the point up stream in this shape [see sketch below]. The salmon swim upstream and enters a narrow aperture in the direction of the arrow indicated and the upper point is closed. It turns and runs down into a long cylinder made of strips of wood bound together by hooks. The force of the current and the speed of the fish drive it down the cylinder and finally the fish fill it full. These traps extend nearly across the stream except a passage way near the shore left open for canoes to pass and which enough salmon go up the stream to spawn and keep up the supply. The Indians are apparently aware of the fact that if they caught all the fish, the supply would cease in a few years."

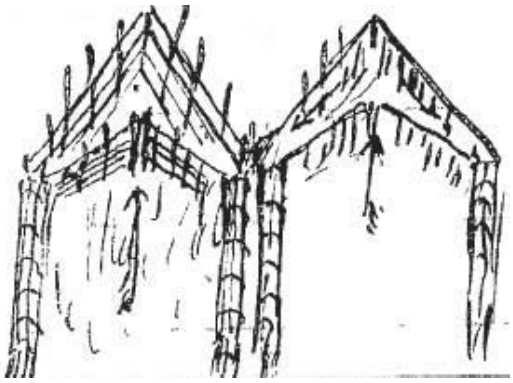


Figure 15 Karta River fish trap observed by Swan in 1875. The arrows point up stream. Source: Swan 1875

It is important to emphasize two of Swan's observations, first that the traps do not extend completely across the river and that a portion of the stream is left open so that the salmon can reach their spawning grounds. That this observation was made in 1875 prior to the onset of severe commercialization is an important refutation of the common statement by early federal fisheries enforcement officials that the Indians were worse than early Euroamerican commercial fishermen in their destruction of stocks by obstructing stream channels. The second point of emphasis is Swan's inference that the Haida were aware of the necessity for "conservation" that is providing for the reproduction of the salmon stock by limiting their harvests.

Swanton (1909:187-188) provides a sketch and description of a weir and trap structure (see Figure 16) described for him in 1900 by a consultant in the village of Skedans in Haida Gwaii. The structure appears quite similar to the one described by Swan and notably also the placement allows passages for upstream salmon movement as well. In the sketch, the weir segments are the dots labeled "b", described as posts; the openings into the trap are labeled "c" and the sides of the trap forming the triangular apex are labeled "a". Swanton (1909:188) states that the flat front sections positioning the trap in the hole in the weir (labeled "d") "were made one fathom higher than the other parts, and were painted on the upper section on the side downstream." An intriguing possibility is that the painted sections "d", positioned to face salmon coming upstream, may be related to the carved trap stakes which Tlingit attached to the front of intertidal wood weir and

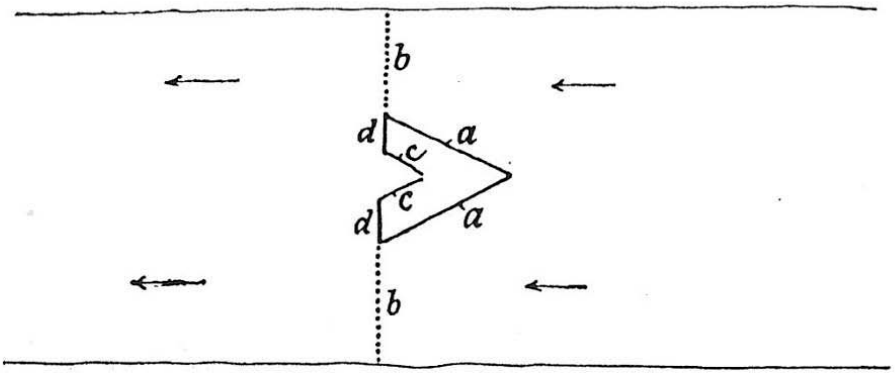


Figure 16 Sketch of instream weir and trap system used in Haida Gwaii. Arrows indicate the direction of the stream current. Source: Swanton 1909:188

stake structures. The purposes of the carvings, and in the Haida case painted planks, may have been to indicate the identity of the stream owners (their totemic crest) or to indicate knowledge of and fidelity to the salmon boy mythic account of respectful treatment (Langdon 2006, 2008).

There is no reported observation or use of the weir and trap system by either Haida witnesses at the Hanna hearings or TEK interviewees for this study. Moser (1899, 1902) does not report observing any of the weir and basket trap complexes in place when his crew did their stream surveys. However in several locations, including the Kasaan

Figure 17 Lattice weir fence and circular basket traps observed by Jefferson Moser in 1897. These were seen next to a stream on Kuiu Island. The black arrow points to the rolled up lattice weir fence and the red arrows to the circularbasket traps.

Xaadas sockeye salmon system at Karta Bay on the east side of Prince or Wales Island, he did observe the lattice weir walls and basket traps stored along the shores of the stream. The K'iis Xaadas may have ceased using this technology in the 1880s when the barricades and beach/drag seines were introduced by whites for commercial salmon fishing. Claude Morrison reported hearing about these systems and used the same Haida term, "*sk uum*" (trap), for these apparatuses as he did for the intertidal stone fish traps.

The other technology used for in stream harvesting of all species of salmon and steelhead (Turek 2004) is termed a "spear" by K'iis Xaadas interviewees. The Haida name for the spear provided by Claude Morrison is *kitúu*. The "spear" consists of a long wooden shaft, typically 12-15 feet in length to which at one end is attached a medium-sized curved and sharpened unbarbed iron hook approximately six inches in length. Mr. Morrison heated, bent, pounded and filed a piece of iron into this shape. The point has to be re-sharpened from time to time. The base of the hook is tightly wrapped with root rope providing a line that will uncoil when detached from the spear. It is attached to a braided line about 8 inches in length. It is seated under a piece of caribou or suede cloth which is lashed with about eight wraps of green twine. The hook is then attached to the head of the shaft in firm but not fixed manner. When it is in use as a spear, the pointed portion of the hook will be away from the shaft such that when it is thrown it will penetrate the salmon and twist, becoming detached from the shaft. The hook can also be reversed with the point turned toward the thrower. When configured in this manner, it can be used has a gaff. When used as a gaff, it is not thrown or released but rather the hook is positioned in the vicinity of the salmon's head on the side opposite of the fishermen and then with

quick motion the gaff is pulled toward the fisherman, impaling the salmon and pulling it quickly to shore. Mr. Morrison explained that when in use as a spear, the device is held so that the hook is not upright but positioned approximately at 2 o'clock. Then as it is thrust forward, it rotates into the 12 o'clock position for hitting the fish on the top. When the hook hits the fish it detaches from the shaft. The pole is lifted quickly from the water and the fish dangles as it is swung to shore.

The staff is made out of hemlock and is at least 50 years old according to Mr. Morrison.

Figure 18 K'iis Xaadas elder Claude Morrison holding his 12 foot long spear in front of his house, 2007.

Figure 19 K'iis Xaadas elder Claude Morrison demonstrating spear position when preparing to throw it.

Figure 20 Hook detached from spear showing how the lighter line is wrapped around the hook and attached to the shaft. Also shown are the heavier lines which hold the hook in place on the shaft.

LAKES AND TRIBUTARY STREAMS

Sockeye and coho salmon are known to survive into the winter months in certain locations and systems. In Hetta Lake, for example, Robert Sanderson and Claude Morrison observed that they have seen sockeye salmon in the lake in December. On at least one occasion, Claude Morrison used his spear in Hetta Lake to try and catch a sockeye salmon but was not successful. Francis Carle (2007: 30) made the following observation:

> "I heard a lot of the old timers talking about like going up to Hetta. They knew just where to cut the holes in the ice and get the sockeye out of there."

Cohos are known to live well into the winter after they spawn in the deeper pools of various streams in the area. K'iis Xaadas interviewees Robert Sanderson and Claude Morrison reported using their spears in the pools of Hydaburg Creek and other nearby creeks in the winter to get old coho. Francis Carle (2007:29) noted:

> "Not too much on sockeyes but lots of cohos because as fish eaters we always want fish. I remember even going up this stream and cutting holes in the ice and chase the cohos back and forth and try to snag them out of there."

Anna Peele (2007) reported her male relatives going to streams on Sukkwan Island with their spears to get cohos in the winter time.

Salmon return migration

By what routes do salmon return to the stream in K'iis Haida territory? As lifetime purse seine salmon fishermen, the Haida TEK interviewees relied upon their own experiences and the oral traditions of other fishermen to answer this question. All of the Haida men TEK interviewees agreed that there were two primary routes by which salmon migrated back to the streams in the area. They agreed that the salmon migrated south on the outside coast past Noyes Island, Baker Island and Suemez Island.

A portion of the run then turns up Meares Passage separating Dall Island from Suemez Island. The men reported several fishing locations, known as "hook-offs", along the northern coast of Dall Island where salmon moving in this direction could be taken. Salmon entering from this northern direction then turned south traveling through Skookum Chuck and then down splitting off in several directions. Some entered directly into Soda Bay while others continued south to Halibut Nose. At Halibut Nose, some turned east and went down North trait and into the streams around the upper portion of Sukkwan Strait including streams on Goat Island, in Natzuhini Bay and Hydaburg Creek. From Halibut Nose, another section of the run continued south down the westside of Sukkwan Island. Finally a segment of the run entering through Meares Pass turned south and went to the streams on the eastside of Dall Island, perhaps as far south as View Cove. The salmon headed for eastside Dall Island streams were generally some of the last fish to arrive in the season.

The major portion of the salmon return continues past Suemez Island and down the outer coast of Dall Island. As lifetime salmon purse seine fishermen, the Haida experts were intimately aware of the various headland locations along the Dall Island shore where the

migrating salmon could be harvested. During the month of July, primarily, they occasionally intercepted darker sockeyes salmon along this shore which they interpreted as being bound for one or another of the small outer Dall Island systems. The last recognized place for intercepting salmon on the outer Dall Island coast was Security Cove. According to Robert Sanderson, strong currents and tidal activity in the vicinity of Cape Muzon apparently pushed migrating salmon offshore into Dixon Entrance. He noted that there were no locations from Security Cove east around Cape Muzon and then north up Kaigani Strait where salmon could be intercepted in July or early August. Rather than head north into Cordova Bay, Sanderson observed that most salmon that were headed for streams on the west side of Prince of Wales Island and Sukkwan Island traveled eastward across Dixon Entrance from Cape Muzon. Tide and currents drove many of them past Cape Chacon before they turned around and followed the southern shoreline around Cape Chacon and then north up the coast. He pointed out that major locations for purse seine interceptions of these schools were found first at Brownson Bay, then Marsh Point, then Shipwreck Point and then Lime Point as the fish moved northward before branching off to head up the fjords, inlets and bays to their spawning streams on southwestern Prince of Wales Island.

Later in August, pink and chum salmon headed for the east coast of Dall Island did make sharper turns around Cape Muzon but still were not intercepted until they re-schooled up along the southwest shore of Long Island or the Dall Island shore immediately opposite.

Sanderson estimated that approximately 85-90% of all salmon south of Tlevak Narrows (or Skookum Chuck) came around Cape Muzon to enter streams in Cordova Bay and only 10-15% entered via Meares Passage.

Salmon movement and schooling behaviors

Elder/experts had various views on the nature of schooling behaviors among salmon. On certain occasions, especially in ocean contexts, schools of mixed stocks of fish would be harvested by purse seines. However, as the salmon continued their migration toward their home streams, the tendency was for schools to be of the same species. Not only were they of the same species, but the schools tended to be of similar size fish, which the elders interpreted as heading toward the same spawning grounds. Claude Morrison (2007: 12) commented:

> "A lot of time you know different groups like when you're trolling sometimes you run into a bunch of cohos and they're small, they're small. And then you go around the same place and another school you run into are good sized cohos. That's [what] I noticed when I trolled."

Salmon can move in waters at various depths. As noted by Hanna hearings witnesses, prior to the onset of commercial fishing and especially the disruptions associated with the positioning of floating fish traps, large schools of salmon could often be seen on the surface of the water. Often this can be detected by behavior known as finning, in which the top dorsal fin and the upper part of the back are above water while the head and rest of the body remain below. Salmon can also be found at mid-water depths and occasionally in shallows.

Salmon tend to follow the shorelines and often mill about at points and headlands especially where tidal currents from different directions mix. However, they will also travel in the middle of channels and virtually anywhere across a channel. These patterns do not appear to be noted by elder/experts as varying by species.

Another issue related to schooling behaviors was whether males and females traveled together in schools and if this pattern varied. Several commentators (Carle, Morrison and Sanderson) had noticed on occasion that certain schools could be predominantly of one gender or another but that more often they traveled in schools of the same species with approximately similar quantities of males and females.

Elder/experts also made observations concerning differences among salmon species in their patterns of schooling and movement. In this respect, Robert Sanderson noted that sockeye salmon were always moving. In Hetta Inlet, schools would move in and out of the bay in front of the stream and up and down the inlet on occasions when conditions and tidal stage did not allow them to move immediately up the stream. This was observed to be the case for sockeye at other systems as well. Sockeyes are also considered to be the fastest of the species and therefore have to be quickly encircled and captured by seines or they will escape. By contrast, pinks and dogs tend to move much less when they are in position in bays or estuaries waiting to go upstream. They will move up with the tide and back out with the tide but tend to lay in schools in relatively shallow areas while waiting the next tide or appropriate water conditions to attempt to go up the stream. Cohos tend to be intermediate in that they move more than pinks and dogs but not as much as sockeyes and not with the speed that sockeyes move. They are also typically found in smaller schools than the other species.

A final point concerning salmon species movement is the observation that under certain conditions and in certain locations, dog salmon would dive to escape from under a purse seine net. Such behavior was recognized by all of the elder/expert fisherman interviewees. Francis Carle (2007: 21) made the following observation on this tendency:

> "I used to catch a lot of dog salmon but they can't call me a dog salmon fisherman. But I kind of had it figured out. I used to get up early in the morning because early in the morning they couldn't see the net then. I used to get them late in the evening for the same reason - they couldn't see the net to dive underneath it."

Salmon presence: signs and jumps

One of the keys for elder/expert Haida fishermen in their professions was to be able to identify the kinds of fish in the ocean by various signs and displays. The presence of feed (schools of smaller fish, such as needlefish and herring), birds, seals and sea lions are all primary indicators that salmon may be in the vicinity. The finning and rolling of salmon on the surface would indicate presence. Most importantly, Haida fishermen watch for jumps. K'iis Xaadas elder/experts often used hand motions to demonstrate how salmon of different species jumped (see Figure 21).

Jumps vary by species and each of the elder/experts was able to provide a description of the manner in which salmon of various species jumped. There was also strong agreement among them on these patterns of jumping. Francis Carle (2007:20) made the following observations on jumping:

> "If you see the salmon jump like a steady jump that means there's a good school. Sockeye jumps are similar to a dog salmon where he won't jump out of the water. He will skid along the water like this when they jump and the dog salmon will do almost the same thing. Where a Coho jump he will jump way up like this then fall almost like a whale but smaller. A humpy jumps he don't care where he jumps; he goes way up in the air!"

Pink salmon, the most numerous salmon, were small, and jump vertically typically with a slight flopping of the body or wiggling of the tail. Their jump has little velocity associated with it so they tend to land relatively close to where they began their jump.

Sockeye salmon, the most prized salmon, tend to make a very rapid jump and stay relatively low to the water. They generally have a slight role to the side, showing the silver on the lower portions of their body, before entering the water at an angle. Their direction of movement is generally evident in how they jump.

Figure 21 K'iis Xaadas salmon researcher Gideon Duncan demonstrates how coho salmon jump out of the water to Tony Christianson and Marita Tolson. K'iis Xaadas use hand motions such as these to show how various species of salmon will jump out of salt water. Photo by Terry Fifield

Dog salmon, tend to come out of the water on their side relatively low to the surface and cover a substantial distance during the time they are out of the water. They exit the water at a fairly rapid speed but this can vary more depending on the relative nearness of the salmon to the stream and thus their age. They are more energetic at a distance from their spawning stream. They too will roll from their side as they proceed through their jump.

Coho salmon tend to jump higher out of the water than sockeyes or dogs and can typically be seen for a longer period of time. They come out energetically, accompanied by more spray, than the other species. They have a lesser amount of role to their jumps than the other species.

King salmon are relatively rare jumpers. Sometimes the entire fish will not come out of the water and roll sideways as they re-enter.. They tend to be straight up and down when they exit and do not cover a very great distance during their jump.

Sockeye salmon run timing

Traditionally and today, subsistence harvests of sockeye salmon have taken place in close proximity to or within the streams to which they return to spawn. Planning for harvests requires a basic idea of when the salmon are likely to appear and observation or monitoring practices to identify when numbers returning make it efficient to engage in harvests. K'iis Xaadas elder/experts have models of run timing for each system comprised of earliest appearance, period of greatest abundance and spawning period. However, those models recognize the possibility of substantial variations of several weeks early or late as being possibilities for any of the aspects of run timing identified. Further, it is also recognized that each system may independently vary in a given year or there may be a general pattern characteristic of a particular year. Robert Sanderson supplied the most complete and elaborate models for each of the systems based on traditional ecological knowledge and his views are used in the presentation below.

Most of the systems follow a relatively similar pattern. Sockeye salmon are expected to begin appearing toward the end of June, and the peak of run when the most fish enter is seen as varying between approximately July 10 and July 20. Sockeye are expected to have completed their spawning in the tributaries of their lakes by the end of September. For all systems except Hetta, the sockeye salmon run is seen as a singular population and not divided into different runs.

The sockeye system of Hetta Lake varies considerably from the others. Robert Sanderson's characterization of the system is found in the section on stream information which follows in the next chapter. Here only the matter of run timing is addressed. In discussing his first experiences with salmon, Sanderson (2007: 2) observed:

> "Historically we usually see the first jump around Memorial Day and they would increase and the early run will be in June then they taper down toward fourth [of July] then pick up again then taper off toward the end of the month [that's] the second population. And the third run which now is the bulk of the run [would follow in August and into September]."

Sanderson observes that the three distinct populations spawn in different locations in the lake and tributaries. Only the first run spawns in a stream and their spawning is completed by September, similarly to other systems. The two later runs are thought to spawn in different portions of the lake. The late run does not conclude its spawning until late in the winter and it has been observed that some late sockeyes do not spawn until after the first of the year. A schematic of Hetta run timing and abundance according to Sanderson is presented in 22.

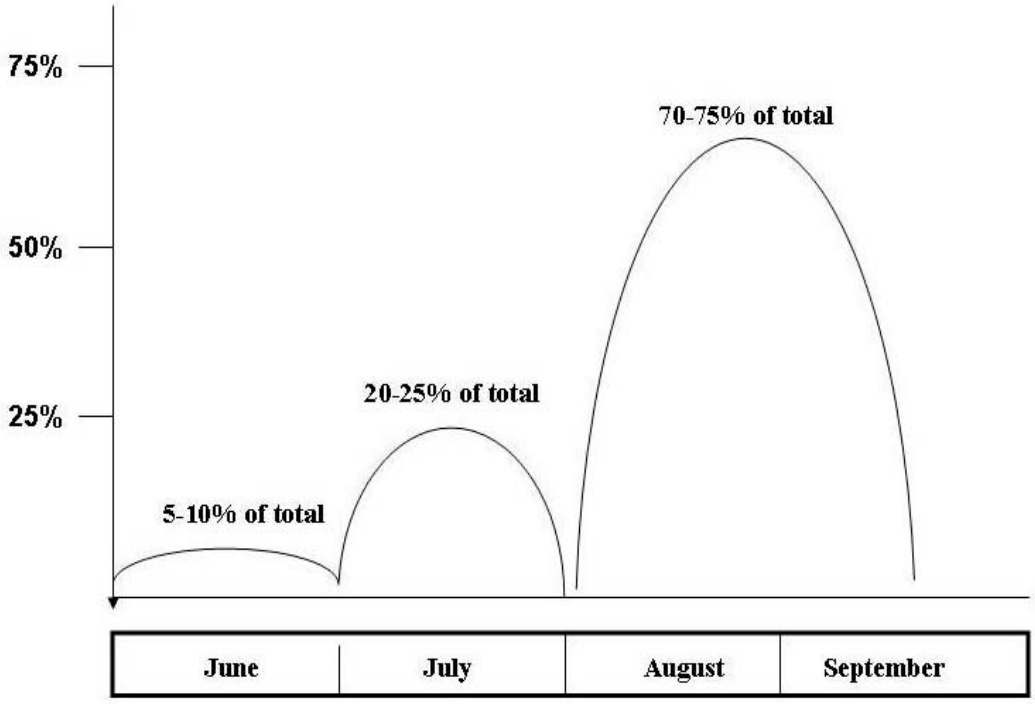


Figure 22 Schematic of run timing and abundance of Hetta's three sockeye salmon populations. Source: Robert Sanderson

K'iis Xaadas elder/experts in general do not have strong views on what factors affect run timing. The one observation that was made by several elder/experts is that a late or cool spring may cause the appearance of the run to be delayed somewhat. Robert Sanderson also noted that cooler ocean temperatures in May and June also seem to delay the appearance of sockeyes.

Sockeye salmon abundance

In general, elder/experts were of the opinion that it was virtually impossible to account for the amount of salmon that might return in any year. Harris Natkong Jr. (2007) simply said that salmon go out and return and no one knows what will happen in between. Robert Sanderson (Sanderson in Carle 2007:30) observed:

> "One thing when we grew up when we looked at salmon there was salmon everywhere. Then a few years later you think there would be lots again [but there wasn't]. Several times I got fooled badly. Sometimes nothing came back. I went through certain extremes, you know, some times ten fish spawn and one came

> back and another time one fish spawned and fourteen came back. Looking at the forecast and what really showed up there is other factors besides escapement. Now you mentioned Hunters Bay we were there four years ago [and there was nothing there yet] there was eighteen hundred sockeyes taken there the last week of July. [Then] they just disappeared but the run was substantial. At the same time at Hetta we figured that was the worst run ever recorded any time in 2002 and 2005 was even worse. Look what happed this year, the last two years - last year 18,000 sockeyes and twenty-some thousand escapement and this year it's going to be up to 15,000 or 16,000 at least. That's from a lousy little escapement. I mean the survival was high and that's the first thing I thought about when you mention coming down here there was 1800 caught [in Hunter's Bay] this year."

Mr. Sanderson's observation makes two crucial points:

1) You can get a poor return off an excellent escapement and you can get an excellent return off a poor escapement.
2) The size and timing of the returns in any year might be quite different from one sockeye system to another.

More discussion concerning factors that elder/experts regard as affecting salmon abundance is provided in the section on impacts on salmon

Sockeye salmon size

Sockeye salmon vary in their size according to the TEK interviewees and other observers. Three categories are typically used: small, medium or average, and large. Small and large are calibrated from a medium, approximately 6 pound sockeye salmon. The size of sockeye salmon may vary in a number of ways (length, weight, girth) and for a number of reasons. The first reason for differences in size is the number of years the fish spend in salt water.

Robert Sanderson explained that there are early differences in the size of fish from one season to the next based on what proportion 4-year olds or 5-year olds are of the total return. For example at Hetta, he noted that if they are predominantly 4-year olds then sockeyes will be medium in size while if they are predominantly 5-year olds then they will be larger. Feed in the ocean would then be an additional factor affecting the relative size of fish from different year classes.

Other observers tended to provide a general characterization of the size of fish returning to a stream. Among the reasons for variation in the size of returning salmon may be the feed abundance in the lake prior to out migration and the availability of food during the time in the ocean. The relative sizes of the sockeye salmon for different systems are reported as follows:

Coffee Chuck – medium (Sanderson 2007)

Eek – large (Morrison 2007, Natkong 2007)

Essowah – large (Douville 2007)

Hetta – small to large, depending on dominant year class (Sanderson 2007)

Kasook – small (Morrison 2007, Natkong 2007)

Nichols Bay – large (Moser 1899)

Hunter's Bay – medium (Sanderson 2007)

Welcome Cove – medium (Natkong 2007)

No assessments of the size of sockeyes from the other systems were provided.

Taste differences of salmon

During the Hanna hearings, several Haida witnesses noted that elders made taste discriminations about the flavor of salmon from different streams. For example, Paul Morrison (USDOI 1944) remarked:

> "It is funny sometimes with the Indians, how people say, 'This creek does not taste good.' So they would go to some other place to get fish. They would say, 'Better fish around in the other creek', you see. So they would go to that creek and they would dry humpbacks."

Powell Charles (USDOI 1944) similarly reported:

> "Now, according to my father …they claimed …that some salmon from some streams were better than the other. In grade I suppose what they meant. …Some has got more oil in them and some has got less. And I guess that is what they meant."

TEK interviewee Anna Peele (2007:11) noted in a similar vein:

> "One year my brother got some from Klakas, I think it was. My mother dried it and it was tougher than the others. It was tougher than the Eek or Hetta dried fish."

Thus flavor (possibly based on the amount of oil in the fish) and toughness are attributes of taste differences among salmon from different stream recognized by K'iis Haida.

Salmon processing and products

There are a wide variety of manners in which the species of salmon were processed and consumed by the K'iis Xaadas.

<u>Fresh</u>

All species of salmon could be consumed immediately after harvest in salt water or estuaries as fresh fish prior to spawning. Common methods included baking and roasting. They could be baked on beaches in pits where they were covered with skunk cabbage leaves and then a fire built on top of the pit. Another method was to roast a fillet of salmon over an open fire by attaching the salmon portions to pointed wooden stakes driven into the ground around the fire, suspending the fish above the flames.

Salmon roe could also be eaten from freshly caught salmon; usually they are boiled prior to consumption.

Smoked and dried

In the 1870s and 1880s, Xaadas left their villages in June to travel to the fish camps at the mouth of streams where they had kinship rights to harvest. Sockeye salmon, followed by pinks, cohos and dogs would be smoked at smokehouses located at the mouths of the streams where they were caught.

In the fall, dog salmon were taken and "hard dried" for use in the winter. This species was preferred for this technique due to their low fat content and therefore a relatively short period of time was required in the damp, rainy season of September to complete their processing. Following the move to Hydaburg, chums were taken from creeks near to the village such as Hydaburg Creek, Bennett's Creek on Sukkwan Island, and Natzuhini Creek to the north of the village. Francis Carle (2007:4) remarked:

> "A long time ago, they used to put up lots of humpies and dog salmon and they used to kind of cut it and soak it out winter time and eat that."

The standard portions of salmon used for smoking and drying were fillets from the body of the salmon. These might be prepared in what is termed "newspaper" style, that is the body is not cut in two but folded open from a cut down the center and then sliced horizontally. The salmon are placed over a rack along the backline with the flesh exposed, that is, inside out. Salmon bodies might be prepared in strips as well. Strips are vertical slices along the long axis of both sides of the body. Sometimes this form of product was referred to as "necktie" style as the two sides are held together by the tail section. In this technique the long strips of flesh are generally turned inside, and the skin face out when the salmon is hung from the rack.

Using either of these techniques, salmon portions may be half-smoked, producing a moist, oily strip or fully smoked producing a firmer, less oily variety.

Other parts of the salmon beside the flesh were also smoked and dried including the eggs and the backbones, a special treat with Claude Morrison delights in to this day.

Figure 23 Smokehouses are positioned along the beach in Hydaburg behind the homes of their owners. Five smokehouses can be identified in this photo.

Figure 24 Robert Sanderson's smokehouse and fish processing station

Figure 25 Hard smoked sockeye salmon strips prepared by Robert Sanderson

Salted

In the late 19th century, mild curing, which is a form of salting salmon prior to preparation as lochs, was introduced to the Xaadas. The practice was adopted by a number of Xaadas who utilized it in the first half of the 20th century primarily. However, a number of families continued it into the second half of the 20th century. Harris Natkong Jr. (2007:3) stated that cohos and dogs were the commonly salted species. They were stored in barrels, and prior to consumption the fillet had to be soaked in freshwater to remove the salts.

One of the specialty products that used to be consumed as salted were salmon bellies.

Canned and jarred

The commercial salmon industry was built primarily on canned salmon. This technology, first utilized for salmon in California and Oregon in the 1850s and 1860s, required the forming of cans from tin sheets, the cutting of fresh salmon to fit into various sized cans, the sealing of the cans and their subsequent steaming in high temperature pressurized machines called retorts. The resulting canned salmon product has a substantial shelf life and became the preferred means for processing the majority of salmon for family consumption by the 1930s as noted by Haida witnesses at the Hanna hearings (USDOI 1944). Robert Sanderson (2007:12) noted:

> "We canned a lot you know and jarred too. Primarily sockeyes and sometimes coho. I don't remember canning humpies or dog salmon that was always smoked or for fresh fish for home use and some of the old beat up one we use for boil fish."

At one point in time during the 1940s, the cannery operated by the Hydaburg Cooperative Association in Hydaburg canned cases of coho salmon as the last act of the season and distributed them to households who had been unable to meet their goals (Sanderson 2007). It is unclear during which years and for how many years this distribution occurred. However, the cannery also cooked cases for families who hand packed sockeyes, pinks and cohos from their own catches and brought them down to the cannery for cooking in the plant's retort.

Jarring appears to have become important in the 1950s and has gradually supplanted canning as the primary form of preservation. Both canning and jarring require the careful sealing of lids and the subsequent use of a pressure cooker or boiling in a pot of water for a sustained period of time to create a finished product. These procedures must be followed precisely or the product may spoil and botulism could result from eating bad canned or jarred fish.

Canning and jarring can be done with fresh fish producing "plain pack" products and can be done with smoked salmon cut into strips. Half-smoked jarred strips of salmon are referred to as "kippered."

Figure 26 Cases of jarred half-smoked sockeye salmon strips. Those awaiting cooking are in the back; in the foreground are empty cases to be filled.

Fermented salmon products

One of the traditional methods used in processing was fermentation. Two basic types of fermented fish product were and are produced. The first of these is fermented dog salmon heads which are called "gink." Francis Carle (2007:14) observed in his TEK interview:

> "I remember this old guy named John Bennet used to make it all the time. He really love it then they would take it down to the beach then dump all the heads they make a rock circle like this then put the heads in it then lay all those leaves over it then cover it with rocks so the seagulls and everything won't get at it then let it get real ripe. They probably let it go about a week or more. A lot of times they would take it and open the skin up because the best part was the nose part where all the gristle and muscles were."

Anna Peele (2007:8) reported that gunnysacks were used to place the fish heads in when they were placed on the beach. While dog salmon were used, cohos and pinks could also be used. She noted that they were typically placed at the low water ebb in front of the village and allowed to ferment for approximately a week. Mrs. Peele commented:

> "They just used to cut the nose part off, the gristle part. They pulled the skin off all the bones and they'd eat it. …It would be crunchy; it was good."

The second type of fermented product had two forms one of which is referred to as "Indian cheese." Salmon roe, especially from dog salmon, were used to make both these products. The first product consisted of fermented eggs which could be taken from their skeins. Anna Peele (2007: 8) recounted:

> "From the dog salmon, they used to ferment the eggs. They used put it in barrels and let lay for about, gee I don't know, sometimes they might use it all winter I think. They let it ferment for about two weeks. They're supposed to keep it in a cool place."

Harris Natkong (2007: 5) commented:

> "They used to call it stink eggs, you know. You'd ferment it for a long time or they'd make cheese out of it, you know."

The "cheese" referred to by Natkong is made by mashing the eggs together inside of the skein and then maintaining it in a cool place. This product could be cut into slices or small pieces for consumption. Francis Carle (2007:23) provides the following account of the production of "Indian cheese":

> "What they would do is take the eggs and let it ferment for about a week so it would get kind of strong then they would take the whole thing and hang it on sticks you know while it was still on the skein. Then they would smoke it. Then after they got that done they would take it down and cut it up like you said and my mother and them used to take it and make it like a round ball. Then they would take skunk cabbage leaves then roll it then get that cheese cloth. Then they tie it up then smoke it again for a couple days so it get like a crust on the outside. "

Spawned out salmon

A specialty often associated with elders is boiled fish made out of "widebody" (male) humpies that had turned white or old dog salmon from the creek. Francis Carle (2007: 24) stated:

> "[Humpy] was the kind they always said was the best but I noticed my Uncle Harris, he and I used to get dog salmon. When we used to get it would be kind of white. When he would get it like that he would take all the skin off. When we would bring it home they wouldn't know what they were really eating but soon as you put it in boiling water it would get kind of milky then it had its own flavor. It tasted better than humpies. "

K'iis Xaadas also prepared by baking or frying older spawned out salmon which they acquired from the streams in the fall. The most common of these was coho which could be taken from "gee lay" or deep pools in Hydaburg Creek late in the year. This fish could be consumed as fresh fish even though they had turned very dark. Anna Peele (2007: 6) reported eating cohos from a "stream across the way" in the winter. To her they were good and she did not notice any difference in taste from fresh fish caught earlier in the year.

Abnormalities and Anomalies

One of the topics addressed in the TEK interviews with elder/experts concerned their observations of abnormalities and anomalies in salmon physical characteristics and behavior. The most frequently noted abnormality was described as follows by Anna Peele (2007: 10) who stated:

> "We use to see some with white things in there. It was usually around the tail. Nobody knew what that was. We never took those."

Mrs. Peele went on to report that these were found in humpies most frequently.

Francis Carle (2007:13) in response to this question answered:

> "Since I'm a fish eater I always notice things like that (laughter). It ah, not very often but sometimes you'll open one and ah you'll see like it has white specks around in it and you say hey, throw it away."

Mr. Carle noted that he had seen the "white specks" in sockeyes primarily.

In addition to the observations about the white abnormalities, Robert Sanderson commented as follows on other abnormalities in salmon that he had observed through the years:

> "Well I've seen diseased salmon. I've seen one or two a year at Hetta. There was one with a big white growth on it just recently but you don't run in to many of those."

He also noted that on one occasion he had seen a tape worm in a king salmon (Sanderson 2007:12).

Francis Carle (2007:13) made a different observation concerning abnormalities in sockeye salmon:

> "I noticed even this year like on the scale parts like ah like it's got little

> [bumps], like it's not right. You know, and if it don't look right I don't [use it]. Almost like it's got something underneath it that you can't see."

Robert Sanderson observed that he had been brought two fish by the Hetta weir crew this season displaying similar characteristics. He commented:

> "I saw two like that in Hetta this year that the guys brought, [and asked me] 'what's wrong here'?" (Sanderson in Carle 2007:13).

He said that he didn't know what it was and had not seen it before.

An anomaly refers to an occurrence that is significantly different from what is expected to be noteworthy and therefore deemed unusual. Only two observations were offered by the elder/experts in response to this question. Claude Morrison (2007: 18) provided the following account:

> "When it was real stormy, it stormed for three days and I was going into Hetta. Here were all the sockeye, they were all over, red ones. I don't know how they all moved back into the ocean. I made a set and got 1,100, and the Corrine, we had to tow them off the beach. It was so stormy, his seine was just full of sockeye. I don't know just what happened."

Mr. Morrison believed that an enormous number of sockeyes had backed out of the lake for some reason, a condition he never observed before or after that time. While he did recall the approximate year of this occurrence, it might have taken place at the time of the logging that took place around Hetta Lake in the early 1950s.

Robert Sanderson commented that he had heard about an anomalous underwater cave and lake system in the area which had a sockeye run that but had not observed it himself.

Impacts on salmon: Environmental and Human

During the TEK interviews, Haida elder/experts were asked for their views on various sources of impact on salmon presence and abundance. This section reports those views.

ENVIRONMENTAL

Trout and Birds

Haida elder/experts were asked about possible impacts on salmon from other species. One of the species mentioned was Dolly Varden (*Salvelinus malma*); Francis Carle (2007:26) did feel that dollies could have an impact on salmon numbers:

> "I'm pretty sure they do. It seems like the dollies come in just when the smolts are going out and the dollies then feed on the fingerlings very easy."

None of the interviewees indicated that they had heard about Dolly Varden as having an impact on salmon either by eating eggs or on smolts during their outmigration in the spring for elders or others during their lives. In addition, none of the other elder/experts reported observing any impacts or believing that dolly varden abundance might impact salmon productivity.

A second category that was discussed was ducks and seagulls. Francis Carle (2007:27) observed:

> "Bob and I we almost lived up that creek [Hydaburg] and once in awhile you see saw bills up there but not too much."

However, as noted in his comment, he did not believe that ducks or other birds consumption of salmon eggs had any impact on productivity.

Beavers *(Haida: Tsang)*

A substantial body of traditional ecological knowledge exists concerning possible impacts of beavers on salmon, particularly the stream blockages created by their dams. During the Hanna hearings, Haida witness commentary on beavers was acquired in response to queries about their traditional uses of the uplands away from the coasts. Quotes from Haida witness testimony concerning the presence, location and methods for harvesting beaver appear below.

Frank Nix on beavers:

> "And when hunting beavers, why, they hid by ponds, and in the early evening he estimates around six o'clock, why the beavers would come out, and they would shoot them with these muskets. …but the beavers, he said, there were none on Dall Island, but on Prince of Wales Island, up way back, he said there was" (USDOI 1944).

George Haldane on beavers:

> "Beaver is hunted with trained dogs…Beaver is an animal that lives in freshwater. They don't get out into the salt water, because if they do they are no good at all. So all beavers are found in freshwater, in lakes and in creeks. …my grandmother told me that when her parents go after a beaver, they would go way up in Karta Lake. My grandmother was descended from Kasaan people. …And they go almost to the---well, you might say the middle of Prince of Wales Island" (USDOI 1944).

Paul Morrison on beavers:

> "And beaver, too. When they hunted beaver, they had to go back" (USDOI 1944).

These remarks do not address the issue of beaver dams and appear to be related to capturing beaver for sale in the fur trade. Nevertheless, the beavers could only be found "way back" which may indicate that they were not allowed to move downstream. In addition, Frank Nix's observation about the lack of beavers on Dall Island is interesting implying that beavers had not reached that outer island from Prince of Wales Island during his lifetime or perhaps they had been kept off by K'iis Xaadas.

During the TEK interviews for this project, respondents were asked about beavers and their impacts on salmon. In response to the observation that HCA personnel had identified that in certain locations beaver dams often block the sockeye streams,

Woodrow Morrison (2007: 10) concurred and provided the following information in this exchange:

> "WM: Yea that's right. SL: Did you ever hear about this as a young man? WM: Yea they used to talk about them. They used to block them [salmon] off from going up the stream. SL: Who would talk about that, do you remember? WM: The older people. SL: The older people huh. Did they have any idea about what should be done about it? WM: Some of them broke their dams up. Yea they broke a hole in it. You can tell where the dam is built. That the runs would drop down."

Harris Natkong Jr. (2007:12) stated:

> "The stories I heard was they'd built their dam you know, shut off the water to the creek. But those Haidas they used to go up break it apart and let the water go through. That's the story my dad told me."

Claude Morrison (2007: 17) noted in his interview that "Since the beaver dam is in Kasook there's hardly any [showing up there]."

Robert Sanderson made the following comment on beavers:

> "One is that [there is an] effect of beavers on small creeks. Three of these little sockeye creeks are completely blocked off now by beavers. They weren't there when I was young" (Sanderson in C Morrison 2007:12)

He commented that he had observed coho salmon jumping over beaver dams in the upper part of Hydaburg Creek. Nevertheless Sanderson (Sanderson in Natkong 2007:14) stated:

> "In my memory, that was back in the '40s they took the Hydaburg beaver dam out. My mother was mayor. That was one of the largest beaver dams I've ever seen. It had a big conical house right out in the center. As far as these 16 sockeye creeks we looked at, [we've] identified five beaver dams and when I was growing up they weren't there at all."

While in the field at the site of the beaver dam in Kasook, Sanderson made the following summative observations on the impacts of beaver dams:

1) They block the stream access of sockeyes and pinks to spawning grounds. This is far more significant for sockeye salmon as the dams often occur just below the outlet of the freshwater lake or just above the outlet of the the freshwater stream to the lake. Since sockeyes must enter the freshwater lake and most then have to ascend to the tributary stream, beaver dams can eliminate a run if it is in place for a four or five year cycle. [See photos of beaver dams in streams in the next section.]
2) They slow the water immediately below the lake outfall and increase the lake level which increases the water temperature. Since salmon, and sockeyes, are sensitive to water temperatures, the increase in temperature may inhibit sockeye movement upstream even if they are not blocked.

3) They lower the stream level and slow the stream flow below the dam. The reduction in the amount and velocity of movement of the water below the dam can affect the ability of salmon to move up the stream especially in low water conditions.

Over escapement

Salmon streams have certain areas in which salmon can spawn. In years of extremely large returns, there may be huge numbers of salmon seeking to spawn in the same areas. This phenomenon has been referred to as "over escapement." One of the TEK questions inquired about the elder/expert views on this subject to which Francis Carle (2007:25) replied:

> "A lot of times we talked about that. [When] all the captains [would get] together we talked about over escapement. Like the last ones that came like kicking up to spawned ones that was already there and kicking them out of the gravel."

Robert Sanderson (2007:12) noted in addition to his affirmation of the possibility of over escapement harming future productivity, this additional effect may occur when too many salmon crowd into a stream to spawn:

> "It can. Say you have a stream just plugged up with salmon and there will be a lack of oxygen and you have a die off."

Other Environmental Conditions

K'iis Xaadas elder/experts recognize a number of other environmental conditions that contribute to the success or failure of salmon populations. Robert Sanderson indicates that in his experience the most serious of these factors is extreme cold in the winter which results in the freezing of rivers. He noted that the collapse of southeast Alaska salmon populations in the late 1960s and early 1970s was directly linked to cold winters. Likewise, the return of abundance in the late 1970s he associates with milder, warmer winter weather which has continued. Francis Carle (2007:21) commented:

> "I think sometimes we have a good year sometimes it has a lot to do with our water temperature the kind of winter we had and it depends a lot on big storms. When we have big storms and the creek gets running like a river we see seagulls diving in the creek. You know what they are diving for they are getting the eggs washing down and that makes a big difference too. I would say temperature, and how much water we have. If we have a big freeze or something but if we have a good mild winter then we have big escapement."

Drought conditions in the summer were also recognized by elder/experts as a major threat to salmon abundance as lack of rain and low water can lead to salmon being unable to get up to their spawning grounds and can also lead to die off before spawning even if they reach the streams.

Sanderson noted that streams that have springs in them or are spring fed seem to have better returns and indicated that the springs, by providing a relatively steady flow of water, can counteract some of the effects of low water and drought conditions and possibly winter freeze-up as well.

Elder/experts noted that there have been longer periods of warm, hot weather in July and August in recent years and that fall rains have been characterized by very large rain drops and enormous downpours over several days. Robert Sanderson noted that such a rain fall pattern occurred one fall in the late 1990s that led to large slides on the Hollis Highway in steep areas of second growth.

HUMAN

K'iis Xaadas elder/experts recognized a number of ways in which humans have and can negatively impact salmon presence and abundance. Among these are blocking streams (barricades), excessive harvest, and logging. Interestingly, mining was not mentioned but it was not directly inquired about in the interviews.

Barricading streams

During his visit to K'iis Xaadas territory in 1897, Jefferson Moser heard objections raised by a number of Haida letters to the barricades in streams (Moser 1899). During the Hanna hearings, these practices were not commented upon, however, one case of the actions of a Haida leader (Edwin Scott) to halt these practices at the Klakas sockeye system he was the owner/trustee of is discussed in the next chapter.

In reviewing the Moser report, the number of sockeye salmon harvested in the early commercial era from the mid-1880s to 1900 and the evidence that nearly every single recognized sockeye system on Prince of Wales Island, Kasook on Sukkwan Island and even Essowah on Dall Island had at sometime been barricaded, led Robert Sanderson to the conclusion that the original productivity of those systems had been damaged by the barricades.

Excessive harvests

Three types of excessive harvest can be identified. Shortly after barricading streams ended around 1900, new types of floating traps were place in the bays and inlets on the migratory routes of the salmon back to their home streams. In was the floating traps (and a few pile-driven standing traps) that the Haida witnesses at the Hanna hearings objected to. The floating traps were operating virtually the entire time between June or July and September, and although they were supposed to be closed on Sundays, there was very little enforcement of these regulations in the 1920s. Smaller streams were seen to be particularly vulnerable to excessive harvest due to the indiscriminant manner of catches that would occur in the inlets. Claude Morrison (2007:18) noted that a floating trap positioned on the southwest corner of Sukkwan Island and in close proximity to Kasook Inlet was "known as a million dollar trap" indicating that the trap was a consistently high producer. At the same time, the predominantly Haida purse seine fleet that fished the waters of the southern Prince of Wales Archipelago could also have occasionally been responsible for excessive harvesting due to patterns of surreptitious fishing in waters closed by federal and then subsequently state regulations near stream mouths. While the extent of the practice is unknown, a number of Haida fishermen did periodically engage in "creek robbing" as these practices were referred to. Finally, it is possible that at times of extremely low runs (for example as experienced with Kasook beginning around 2004),

excessive harvest for subsistence use could have occurred that might damage or reduce the size of runs. This might be the case with Eek and Kasook. All three of these are recognized as potential sources of excessive harvest by Haida TEK elder/experts.

One additional point should be made concerning the status of the smaller stocks of sockeye that return to the streams on the outer coast of Dall Island. Due to the fact that those stocks generally return during early to mid-July, the likelihood of them being damaged by purse seine fishery conducted on large migrating schools on the headlands in the latter part of July is considered to be unlikely. Nevertheless, those stocks may have occasionally received excessive harvesting by the practices of purse seining at the tidal outlets to several of the streams reported by several Haida fishermen (Natkong 2007, Sanderson 2007).

While no longer mentioned as a major impact on salmon populations in their area, K'iis Xaadas elders had observed that high seas interception gillnet fisheries conducted offshore by foreign fleets may have had impacts on runs from the 1950s to the 1980s. This was not mentioned as a current concern though occasionally they observed net marks resulting from gillnetting on salmon they caught.

Logging

The final category of human impact on salmon presence and abundance is that of logging. The most important case of impact sited by Robert Sanderson and Claude Morrison is that of the damage that logging around Hetta Lake in the early 1950s did to the sockeye runs. In Sanderson's view (see below for his description of those activities), this highly productive sockeye salmon system, contributing a substantial economic and subsistence return to the community in the late 1940s, was devastated by the logging activities that occurred at that time. In his view, it was over 40 years before the system returned to the level of productivity that it had recovered to by the late 1940s.

Another example of logging impacts identified by several observers was that of Natzuhini Creek located to the north of Hydaburg. In the view of Haida elder/experts the banks of the stream were insufficiently protected Robert Sanderson (2007:20) described what happened and the consequences as follows:

> "Now Natzuhini had a good run in the past. But Sealaska [logged along the stream and] that fall there was a slide at the head of the bay and the minerals underneath it turned to liquid just like clay and the whole bay turned white. And the second year the same thing [happened] so it affected both cycles of pinks and the runs went down for about six years before they start to recover somewhat you know. The humpies and dogs [recovered somewhat] but the cohos have not come back yet. I think what we did was wiped out two cycles of cohos and they have to spend to whole year in fresh water. We had that suspended clay in the whole bay up there [which] turned white from the discharge. We investigated and found out it looked like rock until it was exposed by the land slide then it liquefied."

Francis Carle (2007: 26) also commented on how logging affects salmon production referencing the Natzuhini case as well as Long Island:

> "I've been a logger and then a fisherman too. If you log too close to the stream for some reason, the bark has something to do with it, [and if logging] causes silt to go in that stream that cuts the oxygen off from the eggs. It seems like a lot of places where they logged the creek will get silt for some reason. Right now we are having a problem with up the head of the bay where Sealaska was logging in Natzuhini where we used to get a run of maybe sixty, seventy thousand fish going up that stream - big dog salmon, lot of cohos but mostly pinks. We stopped by there the other day and we were standing on the bridge. I thought maybe I had my son Richie with me and asked him 'How much fish are we looking at there?' He said about two hundred. You see cohos quite a ways on one side or the other side because what we had two landslides since they logged and really knocked our run down up there. Since Klukwan [has] been logging on Long Island it was mostly private land [so] I don't think the Forest Service watched the logging that close. I think lot of time they pull the logs right over the creek and was affecting us in a lot of ways cause a lot of that fish we could have used aren't there now."

Concerning the status of Coco Harbor, a system noted as a large producer of fall or late season dog salmon on the east coast of Dall Island, Robert Sanderson (Sanderson in Carle 2007:27) noted:

> "I looked at it [Coco Harbor] yesterday and it made me kind of mad. When we went over Devil's Lake, [I saw that Sealaska Timber Corporation] logged that whole watershed on the main creek and it looked like they got right down to the trees on the edges in certain places. You could see the limestone. That's one … Fish and Game have escapement [estimates] for probably a minimum of 20,000 salmon and some years much more. I didn't see any jumps yesterday although they may be further out yet."

He also commented: "Ham Cove has never come back after three times logging" (Sanderson in Carle 2007:27). The reference to "three times logging" refers to the fact that the location had also been logged on a small scale basis two other times earlier in the 20th century prior to recent logging by Sealaska Timber Corporation.

V. SOCKEYE SALMON SYSTEMS

Information on the customary and traditional sockeye systems of the K'iis Haida are presented in this section. For each stream, the following information is provided:

- Name – English and Haida (if available) and locational information
- Information from published biological literature – stream size, sockeye presence, peak observations, other significant information
- Precontact salmon harvesting technologies - Documentary and observational information;
- Information from published historic literature on commercial harvest;
- Traditional Ecological Knowledge (TEK) – specific system information from documents and interviews including commentary by R. Sanderson on sources and harvest information;
- Historic impacts – barricades, overfishing, traps, landslides, logging, etc.
- Recent subsistence use – trend since 2000
- Field observations – foot and aerial investigations, including pertinent photos.

Sockeye system information will be presented by island in the following order: Prince of Wales Island, Sukkwan Island and Dall Island. The information is organized from north to south on each island.

Figure 27 K'iis Xaadas Sockeye Systems Field Research Team – Left to Right: Tony Christianson, Marita Tolson, Steve Langdon, Ben Young, Gideon Duncan, Robert Sanderson. July 2007 at Eek Inlet. Photo by Terry Fifield

Eek ***Haida: íikw***

Eek Inlet is located on southwest Prince of Wales Island where Sukkwan Straits enters Hetta Inlet.

ADF&G District and Number: 103-25-009 Lat N 55° 14' 86" Long W 132° 66' 53"
Area: The sockeye salmon system outlet stream is located near the head of Eek Inlet on the north shore.

Distance from Hydaburg: Eek Lake is located approximately seven miles southeast of Hydaburg at the head of Eek Inlet.

Biological data: The Eek system consists of two lakes connected by a short stream to each other. Both lakes are about one mile long and the upper lake drains into Eek Lake by a stream about 100 yards long, and over a series of rapids. The lower lake is only about six feet in elevation above high tide in Eek Inlet. A five foot waterfall with a deep pool is located on the connecting stream between the two lakes. During the period of federal jurisdiction, observations of the system were made on six occasions from 1949 to 1963 with sockeyes reported in each year ranging from a low of 50 in 1949 to a high of 23,500 in 1959 (Orrell et al 1963). Edgington et al. (1981) provide a sketch map of the outlet stream to the first lake that show no beaver dams no blockages from tree falls. The peak recorded escapement of sockeye from 1960 to 1980 was 3-4,000 in 1962 (Edgington et al. 1981:300) but no survey of the system occurred between 1964 and 1980. Edgington et al. (1981: 301) comment that stream flow due to water depth could be a factor controlling spawning and rearing in the system.

Precontact salmon harvesting technologies: The remnants of two intertidal stone fish traps were identified in the estuary of the Eek outlet stream. The intertidal zone is unusual as there are two relatively flat bedrock platforms with an abrupt drop of 6-8 feet between them. At normal low tide both platforms are exposed while at high tide both are inundated. The remains of the stone trap are clearly discernible on the upper platform where a semicircular portion of tightly fit stones remains. One fork of the stream flows through the trap and a pool that form in a natural depression. On the lower platform, the structure has much less integrity. The structures are similar to intertidal stone fish traps identified elsewhere on the west coast of the Prince of Wales Archipelago and appear designed to catch salmon on the ebb tide using the "tidal pulse" fishing strategy (Langdon 2006, 2007).

Figure 28 Eek upper intertidal stone trap – arrow points to feature

Figure 29 Eek lower intertidal stone trap – arrow points to feature

Historic records of commercial harvests: Moser (1899:75) states: "The Klawak cannery has taken a few scattering redfish here, but never more than 1,000 during a season." Eek salmon production for 1896-1897 are provided in the table below.

Table 4 Eek Salmon Harvests: 1896-1897

Year	Harvest Date	Species	Number	Cannery
1896	July 10-Aug. 25	Sockeye	8,688	HB (Hunter's Bay)
1897	July 14-Sept. 26	Sockeye	9,213	HB
	Aug.16-31	Coho	473	HB
	July 31-Aug. 31	Humpbacks	25,400	HB

Source: Moser 1899:75

Moser (1899: 75) estimated the annual sockeye production of the stream to be 7,000.

TEK: Exhibits submitted in support of the Hydaburg petition stipulated that "…Sukkwan Strait to Eek Point is claimed by two parties, John Wallace's family and the family of the Nix's and Natcong's" (USDOI 1944). John Wallace is listed in other documents submitted as exhibits in support of the petition as the owner of salmon streams along Sukkwan Strait to Eek Point (USDOI 1944). Paul Morrison commented as follows on the status of production from Eek in the 1940s:

> "All along this inside coast is interfered with by traps. Like Hetta, like Eek. That [Eek] used to be a sockeye stream, but you do not see any sockeyes in that stream now, and nobody fishes there at all. Because the fish is gone."

TEK consultant Mrs. Anna Peele's father was Frank Natkong who was a "Brown Bear" (Peele 2007:4). Brown bear is the name of the first house of Quetas lineage at Sukkwan village and the primary crest of that lineage (Swanton 1905: 294). She reported traveling to Eek and processing sockeye salmon with her family as a child in the 1930s at a cabin which her father had near the mouth of the stream. She stated that during her childhood she did not observe anyone asking her father for permission to fish or bringing him some sockeyes from their catch. It was her impression that "anybody went in there and got there fish, they didn't have to ask" (Peele 2007:4). Neither did he make any decisions concerning when fishing could occur, where it could occur or how many fish could be taken. According to Robert Sanderson (PC): "Frank Natkong was a member of the lineage that held ownership of Eek. He had a camp on the left side of Eek Inlet just before you reach the stream. His family and relatives came there and put up sockeyes in July."

R. Sanderson characterization: "Sockeye first start to show around the fourth of July and continue through the entire month of July, sometimes to the tenth of August during a drought. The sockeye run historically varied from a low of about 2500 fish, to perhaps 25,000 in peak years. Because of the early timing of the return, not many sockeyes from this system are caught in the commercial fishery, except for some fish caught in District 4, by purse seiners on the outer coast of Dall Island in the month of July. Historically, this stream was ranked second only to Hetta, providing for the subsistence needs of the community of Hydaburg.

During the year 1993, the Hydaburg Cooperative Association accessed the abundance of sockeye by a mark-recapture method, and it was determined that the sockeye escapement was about 1400 fish. Approximately 2,000 coho salmon were recorded as escapement in September. From personal observation and stream counts the following years, the total escapement was at least double over that of the preceding year, probably totaling over 3,000. About 2,000 coho salmon were also observed at the inlet stream during that time. The sockeye average mostly large fish in the system, probably primarily five year-old fish.

Beaver have caused problems in the recent past building a dam on the outlet stream that blocked sockeye access to the lake. The dam was later removed."

Historic impacts: During his visit to the stream in 1897, Moser noted that: "Part of an old barricade was found between the entrance and high-water mark" that is in the stream channel proper between the tidal outlet and the outlet of the first lake. Paul Morrison (see above) and other Haida witnesses during the Hanna hearings contended that floating and pile fish traps that were installed in the 1920s had significant negative impacts on salmon populations to various systems, one of which was Eek.

Recent subsistence use: According to R. Sanderson:

> "For the subsistence harvest of Hydaburg residents, the Eek system is a substantial contributor which in low years provides about 1,000 sockeye. Peak years will produce much more, sometimes over 5,000 as in 1980. In several years in the 1990s and other times past, Eek has contributed at least that much to the subsistence fishery. Perhaps 10% to as high as 25% of the subsistence sockeye harvests by the residents of Hydaburg are taken from the Eek Lake system."

Field observations: Eek was visited in July 2007 on foot and by aerial observation on September 2007. On July 14, 2007, Eek Inlet, stream and lake were visited on foot. No sockeye jumps were observed traveling down Eek Inlet. No salmon were observed in the estuary or stream. Tony Christianson walked up the stream to the lake outlet and observed no beaver dams or obstructions due to fallen logs.

Figure 30 Eek Lake sockeye system

Hetta ***Haida: íítta***

Hetta Inlet is an arm off of Cordova Bay on the southwest coast of Prince of Wales Island.

ADF&G District and Number: 103-25-047 Lat N 55° 16’ 81” Long W 132° 57’ 92”
Area: The Hetta Lake sockeye salmon system outlet stream is located on the right side of the inlet about approximately two miles from Sukkwan Straits. The outlet stream is approximately a mile in length; a small isthmus separates the outlet stream from the lake outlet for in the middle section of the stream course.

Distance from Hydaburg: Hetta Lake is located approximately 10 miles southeast of Hydaburg on the east shore of Hetta Inlet.

Biological data: Orrell et al. (1963) reported that 14 annual observations were made of the Hetta system between 1940 and 1962 with sockeyes being reported in seven of those years. On three occasions 10,000 or more sockeye salmon were reported in the stream system (Orrell et al 1963). Edgington et al. (1981) summarize the ADFG estimates of peak sockeye escapements from 1960 to the last reported visit in August, 1979. Over these 20 years of State of Alaska management, sockeye were observed on only three occasions, the peak number being 53 sockeyes reported for Sept. 13, 1978. During the August 23, 1979 visit, no sockeye were reported observed. An extremely large quantity of logs was reported at the lake outlet, some of which had sunk to the bottom; the report suggests that as a result of this logjam “access to lake may be blocked” (Edgington et al. 1981:356). Interestingly, Moser (1899:74) commented that the “outlet at the lake end is covered with driftwood, which, however, does not prevent the passage of fish.”

Precontact salmon harvesting technologies: No precontact salmon harvesting technologies are identifiable at Hetta and none have been reported.

Historic record of commercial harvests: Moser interviewed the superintendent of the Hunter’s Bay cannery in 1897 and again in 1900 (Moser 1899, 1902). The two tables below present the salmon harvest figures he obtained for Hetta on those two occasions:

Table 5 Hetta salmon harvests, 1887-1897

Year.	Klawak cannery.			Hunter Bay cannery.		
	Species.	Dates.	No.	Dates.	Species.	No.
1887	Redfish	July 3 to Sept. 14	24,022			
1888	do	July 4 to Aug. 26	47,468			
1889	do	July 6 to Aug. 23	48,585			
1890	do	July 6 to Aug. 28	59,673			
1891	do	July 11 to July 16	1,089			
1892	do	July 16 to Aug. 22	51,479			
1893	do	July 11 to Aug. 23	10,586			
1894	do	July 7 to Aug. 31	47,769			
1895	do	July 3 to Aug. 24	78,464			
1896	do	June 29 to Aug. 23	104,602	July 10 to Sept. 20	Redfish	96,697
1897	do	July 7 to Aug. 30	84,980	June 27 to Sept. 26	do	114,796
1897	do			Aug. 22 to Sept. 26	Cohoes	12,964
1897	do			July 20 to Aug. 31	Humpbacks	28,196

Source: Moser 1899:74

Table 6 Hetta salmon harvests, 1898-1900

Species.	1898.		1899.		1900.	
	No.	Date.	No.	Date.	No.	Date.
Redfish	179,109	June 10–Aug. 3	250,834	June 15–Sept. 5	138,733	June 17–Aug. 23
Cohoes	290		539		.....	
Humpbacks	25,000	July 25–Aug. 25	229,556	June 27–Aug. 23	58,216	

Source: Moser 1902: 301

Moser (1899:74) suggested that Hetta may be "able to yield 150,000 redfish though under average conditions 50,000 seems the limit."

TEK: Exhibits submitted in support of the City of Hydaburg petition in 1944 concerning aboriginal titles held by lineage/house heads indicate that: "The district from Eek Point to Lime Point including Hetta Inlet was claimed by Mose Koolkeet, a descendant of the group that crossed the portage at Sulzer" (USDOI 1944). Further, in regard to ownership of the stream at Hetta, the exhibit stipulates that Moses Kolkeet was the owner of Hetta Inlet (USDOI 1944). As noted earlier in the report, a copy of the lease between Moses Kolkeet and superintendent Wadleigh of the Klawock cannery to use Hetta sockeyes was filed with the recorder in Wrangell in 1896, the year when Hunter's Bay cannery opened (see Appendix 2). Haida witnesses at the Hanna hearings corroborated these statements and added additional commentary on the manner in which "Moses Kolkeet" conducted his ownership of Hetta. Frank Nix asserted that his uncle "George Kilzer" was the owner of Hetta – but was known to the whites as "Moses Kolkeet" (USDOI 1944). Sam Davis (USDOI 1944) commented:

> "I know with reference to Hetta here that the cannery at Klawock I think paid them fifty dollars a month, if I am not mistaken. I don't know the amount, but I heard that it was fifty dollars a month. And a man from Hunters Bay, because he could not pay anything, he could not seine in that body of water until later on."

This statement indicates that Kolkeet was able to control access of cannery fishermen to Hetta sockeyes and that he was paid by the cannerymen to access the fish. Moser (1899:74) states that: "When fishing for this [Klawak] commenced here the rights of the Indian claiming the stream were recognized and a 20-year lease was made with him at an annual rental."

R. Sanderson characterization:
"The Hetta Lake system is located on the east side of Hetta Inlet, southeast of Hydaburg on Prince of Wales Island. Hetta has long been known as one of the finest sockeye producing systems in southeast Alaska. As such, it is the primary source of subsistence sockeye for Hydaburg residents. The system consists of about a half a mile long stream that drains the lake in which large numbers of pink salmon spawn up to 150 yards from lake outlet. Coho salmon enter the lake in September and October with runs up to 4000 escapement having been recorded recently.

As previously noted, the owner of Hetta when the commercial salmon fishery began in the 1880s was a man named Moses Kolkeet who lived in Howkan (Wright 2002).

Sockeye salmon begin appearing in the latter part of June and continue throughout July. Hetta is the only system in which the sockeye run is primarily in August continuing into September with the last fish showing at the end of month.

The one tributary stream to the lake that supports sockeye spawning enters the lake on the northwest side above the outlet stream. It is a fairly short stream in which only the salmon from the June run spawn. Sockeyes that return in July, August and September spawn along the shores of the lake, in upwelling areas, near underwater springs and on the edges of the delta areas of lake tributaries.

A hatchery was operated for about 25 years in the early 1900s managed by A.J. Young who reported observing sockeye spawning around Christmas and even after the first of the year. In the past, Haida people speared sockeyes during the winter and early spring in association with trapping activities. During an HCA trip to Hetta on December 5, 2006, sockeye were observed spawning at various locations in the lake.

There are three populations of sockeye that return to Hetta. About middle of June to July 4th the first run enters the lake. The peak of the run is June 20-25. This run historically supported a good subsistence fishery but in recent years, this run has been considerably reduced. Fish from this run spawn in the east tributary and by the end of September are spawned out. The second population enters the lake at the first of July and continues to the end of the month. This is a substantial run of sockeye, contributing a large part of the subsistence catch, plus lesser amount to the commercial fishery. This run spawns in various locations in the lake as mentioned above. Spawning starts in mid-September and continues through October, November into the winter. The third population of sockeye enter the lake beginning about the first of August, normally peaking between August 17-20. The run continues in substantial numbers to the end of the month and then tapers off through the middle of September. In 2007, however, a very large portion of this run appeared during the first half of September with significant numbers entering between September 7 and 10th.

Hetta salmon have provided substantial quantities for the commercial salmon industry. Recorded harvests from around 1900 for canneries show that in excess of 200,000 sockeyes were taken in two years while over 100,000 on several other occasions. During the period of the operation of HCA cannery from 1938 to 1975, sockeye salmon taken after July 26 and into August provided a substantial portion of the pack averaging around 20,000 per year with one year estimated at 86,000 sockeye in the mid-1940s.

One of the major historic impacts to the Hetta salmon system was the logging activities that were conducted in 1949 and 1950. The HCA submitted a letter to the Forest Service at this time opposing the logging indicating that in the previous year about 90,000 had been taken commercially by the Hydaburg fleet from the Hetta system. At that time, the value of the harvest was estimated to be approximately $50,000 to the economy of the

village. The Forest Service put the burden of proof on the village requiring us to demonstrate that the proposed logging would have a detrimental effect on the salmon run. The Forest Service approved the logging plan and the timber was harvested. An A-frame system was utilized in which trees felled from various location around the lake were dragged across the lake and then through a high-lead down the outlet stream and into the salt water.

One of the areas logged was northwest of outlet stream in proximity to a non-sockeye salmon spawning stream. The logging triggered a large landslide which spilled into the spawning area. The fish had been observed in this area recently. The largest areas in the lake for spawning sockeye salmon are at opposite end of lake with the largest amount of spawning occurring on the northeast shore to the east of the sockeye spawning stream and abundance spawning also occurring in the small cove on the southwest end of the lake. Logging occurred in proximity to both areas and the felled logs dragged through the beach areas where the salmon spawn. Debris from the logging operations remain on the lake shore even to this day.

At the time of the logging operations, the runs of sockeye were recovering, at times even approaching historic high levels. About five years after logging had ended, the sockeye runs dropped off sharply, effecting both subsistence and commercial harvests. The runs did show any recovery until the mid-1980s with gradual improvement continuing to the year 2000.

Of all the areas where timber harvests have occurred near Hydaburg, this is the one that has affected the community the most due to its impact on the economy of the village and subsistence catches. I know of no other logging operations that have affected the community of Hydaburg to this extent.

In recent years we have considered 40-50,000 a goal for escapement levels. Probably the system could produce 150,000 on a sustained use basis."

Historic impacts: Moser (1899:73) reported that “There are no barricades in the stream now, though it is said that until a few years ago it was barricaded every year.” He observed obstructions across the stream “which could be readily utilized as barricades’ (Moser 1899: 73). Historic impacts to Hetta beside barricades include early cannery high level harvesting (in excess of 200,000 sockeye in 1896 and 1899), inside waters fish traps in the 1920s and 1930s, and possibly purse seine interceptions. A landslide triggered by logging activities occurred on the northwest side of the lake around 1950 which appears to have had a negative impact on sockeye production from the tributary stream in that area as did other activities associated with logging around the lake. Edgington et al (1981:357) note that “On old maps, the stream is labeled ‘logging canal’.”

Recent subsistence use: Hetta is the primary source of subsistence sockeye production for the K’iis Xaadas of Hydaburg. Recent harvest levels have fluctuated dramatically in response to various factors primarily involving the size of the returning sockeye population but also other factors such as gasoline costs. Table demonstrates that

subsistence harvests have ranged from a high of approximately 40,000 in 2000 to as low as 800 in 2002.

Table 7
Hetta Sockeye Salmon: Subsistence Harvest and Escapement, 2000-2008[1]

	Subsistence Harvest No. of Fish	Escapement	Comments[2]
2000	40,000	70,000	Excellent - poor return
2001	5,090	Est – 11,000	Fair
2002	800	2,000	Poor, one of lowest ever
2003	5,700	Est-	Fair
2004	5,900	Est-	Fair
2005	800	2,000	Poor, one of lowest ever
2006	9,500	19,500	Good
2007	3,500	14,000	Late run peak in September
2008	3,600	4,800	Fair return, late run strongest

[1] Estimates are lacking for the years 2003 and 2004 due to technical problems with the catch and release method of run strength assessment

[2] Assessment based on rating of excellent, good, fair and poor

Source: R. Sanderson

Field observations: Hetta Lake was visited in July 2007 and August 2008 for this project. A weir project was underway on both occasions. Reports of those investigations provide detail about the recent status of sockeye returns to the Hetta lake system. The large logjam at the lake mouth of the outlet stream was still in place. At the end of September of 2008, a large landslide near the tidal mouth of the outlet stream occurred, and some of the materials (logs, earth) reached the other side of the stream entry but did not block salmon access. A slight alteration of the bottom occurred as a result of the deposition of rocks which elevated the intertidal estuary level.

Figure 31 Lower portion of Hetta outlet stream just above tidal entrance

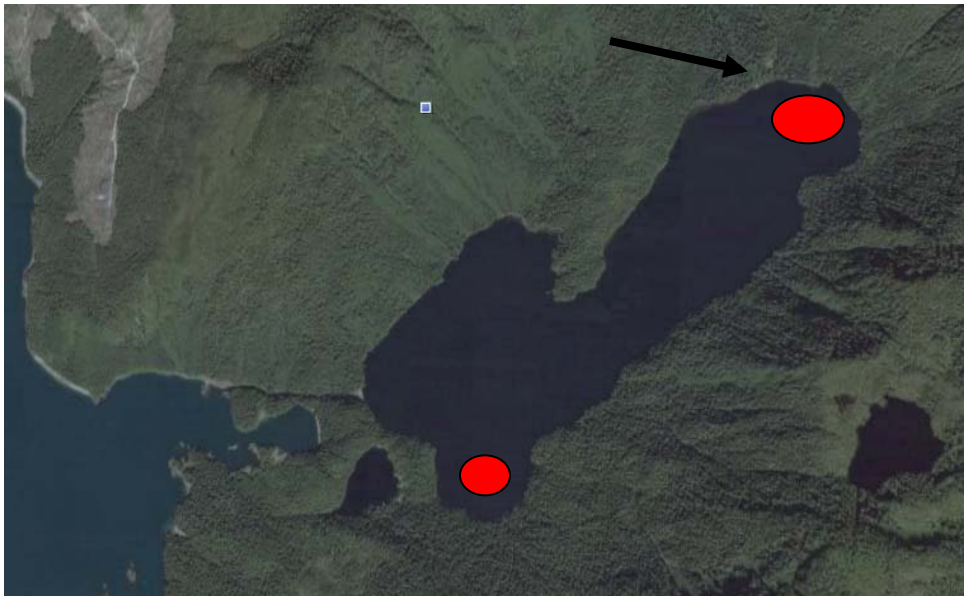


Figure 32 Hetta Lake sockeye system showing spawning areas; black arrow shows sockeye tributary stream and red ovals show areas of lake spawning.

Nutkwa ***Haida: Nutkwa (possibly Tlingit)***
Nutkwa Inlet and the entrance to Nutkwa Lagoon are located about 16 miles southeast of Hydaburg, between Lime Point and Keete Inlet.

ADFG District and Number: 103-21-08 Lat N 55° 08' 49" Long W 132° 27' 28"
Area: Nutkwa Lagoon and the sockeye systems are located on the southwestern shore of Prince of Wales Island in Nutkwa Inlet.

Distance from Hydaburg: It is approximately 12 miles from Hydaburg to Nutkwa Inlet.

Biological data: Nutkwa Inlet is a lagoon that is salt-water influenced on each tide. The sockeye salmon stream is located at the eastern head of the inlet. Federal records indicate that stream observations were made at Nutkwa on 14 occasions between 1929 and 1962 during which time sockeyes were recorded on five occasions ranging from a low of four to a high of around 300. A weir installed on August 9, 1929 recorded 83 sockeye salmon (Orrell et al 1963). Due to the fact that Nutkwa Lagoon is one of the largest pink salmon producing systems in southeast Alaska, it was subsequently visited on numerous occasions by ADF&G biologists with a peak count of over 100,000 pink salmon estimated in 1975 (Edgington et al. 1981:198). Their visits to the system were generally in late August or September and therefore provide little information on the sockeye portion of the system which occurs in July. However, between 1960 and 1980, sockeyes were observed on nine occasions with a high peak estimate of 1400 in 1971 with a next high of 600 in 1970 (Edgington et al. 1981:199). The stream is considered "spotty" for sockeye production (Edgington et al. 1981: 198).

Precontact salmon harvesting technologies: None are reported and since the stream was not visited, none were observed.

Commercial harvest records: According to Moser (1899: 73) "In 1896, 850 sockeye [were] taken for Hunter's Bay cannery at Nutqua Inlet." Apparently Alec Miller also operated a saltery at Nutkwa as is described below. No other published commercial harvest figures for Nutkwa sockeye production are known.

TEK: During the Hanna hearings, Paul Morrison provided the following testimony concerning Nutkwa:

> "I understand that the white men, like at Klawock Cannery and Hunter's Bay cannery, recognized the owners of the [traditional] traps until it comes to my uncle, an old man, that was claiming Nutkwa. When Alec Miller established a saltery at the mouth of the falls – at the falls out of Lake Lagoon – the old man had a camp at the mouth of the falls, and, he was paid by the day to take fish out. His son is still living. His name is Hugh Cogo. …. Alec Miller was paying him by the day for taking the fish out of his claim. …I know it…because I was with him. He was paid for taking fish out of his claim. My Uncle Cogo camped right at the mouth of the falls there [Nutkwa]. Alec Miller's boat goes out and catches the fish. Ben Nathan's father was seine boss in that skiff. Uncle didn't do

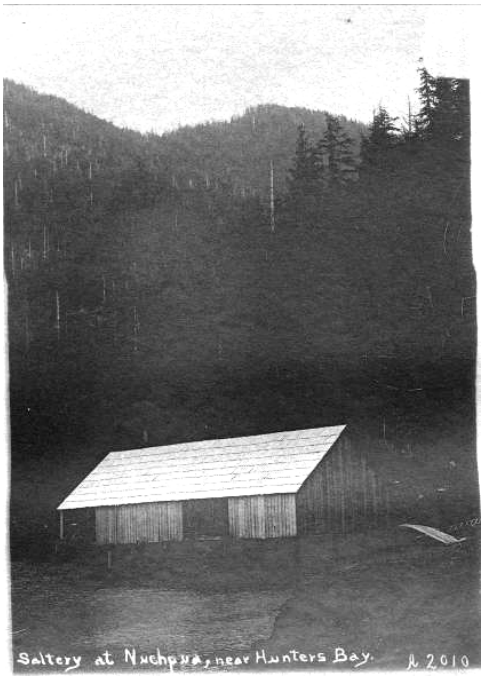


Figure 33 Saltery at Nutkwa, 1897 (Moser 1899)

> anything – he just camped at the mouth of the falls there – below the falls. Ben [Nathan's] father and his native crew were the ones that caught the fish. Alec Miller paid them for the fish, so much a day. My uncle was paid by the day too – just the same day's wages as the crew of fishermen were getting" (USDOI 1944).

R. Sanderson's characterization: "A saltwater rapid is located at the mouth of the lagoon, which is impassable to salmon except at high tide. Three small streams enter the lagoon and one large stream at the upper end of the lagoon. The large stream supports a very large run of pink salmon, one of the largest in all of southeast Alaska. The stream splits into two forks about ½ mile from the mouth. About one mile of the south fork is accessible to salmon up to a large waterfall. The north fork of the stream produces the bulk of the salmon to this system. A small lake is present, about three miles upstream of the north fork. This lake supports a small run of sockeye in July, perhaps 700-800 sockeye in total. The peak of the run is expected during the middle of July. During the last week of July, strong runs of pinks and silver salmon migrate into the lagoon and upper stream, at about the end of the small sockeye run producing a mixed stock fishery in which it becomes difficult to harvest only sockeye salmon."

Field Observations: No field visit to Nutkwa Lagoon and stream were possible due to tidal conditions during the time at which we were in proximity to the area in July 2007 and August 2008. During the flyover of the system on Sept. 9, 2009, no salmon were observed and no beaver dams were observed blocking the tributary or outlet.

Historic impacts: Due to the utilization of Nutkwa sockeye salmon in 19th century saltery and cannery, it is quite likely that either the stream was barricaded as elsewhere in the

area or was subject to high levels of harvest. Subsequent interception of sockeye from the system in 20th century purse seine fisheries may have occurred.

Recent subsistence use: It is unknown if there has been any use of Nutkwa for subsistence sockeye production since 2000.

Figure 34 Nutkwa Inlet – the sockeye stream is the large stream at the head of the inlet, upper right hand corner.

Keete ***Haida: unknown (possibly from Tlingit)***
Keete Inlet is the next embayment south of Hetta Inlet on the southwest coast of Prince of Wales Island.

ADF&G District and Number: 103-21-018 Lat N 54° 06' 44" Long W 132° 49' 61"
Area: The sockeye system is located at the northeast head of Keete Inlet.

Distance from Hydaburg: Keete stream is located at the head of Keete Inlet, approximately 15 miles southeast of Hydaburg.

Biological data: Federal records indicate that stream observations were made at Keete in 17 years between 1929 and 1962 (Orrell et al.1963). On three occasions sockeye salmon were reported, the last occurring in 1950; a weir installed July 21, 1930 recorded 70 sockeye but in 1942 30,000 sockeyes were estimated on September 19th. There are no observed or reported sockeye salmon in ADF&G records for Keete stream. Edgington et al. (1981) includes a sketch map of the outlet stream from the mouth to just below the lake. The sketch map shows a number of areas with fallen logs across the stream but no blockages resulting from these trees. It also reports the presence of "beaver dams 0.3 miles from lake" (Edgington et al. 1981: 216)

Precontact salmon harvesting technology: A possible semi-circular stone fish trap was identified on the north side of the estuary in a grassy flat area of the lower zone. A possible depression was also identified in the middle of the feature.

Figure 35 Possible semi-circular intertidal stone fish trap at Keete. Located on the northside of the intertidal area at the mouth of sockeye salmon system. The arrow points to the rock alignment.

Historic records of commercial harvest: Keete is not discussed in Moser (1899) as a source of sockeye salmon for the early salteries and canneries. No other historic records of commercial harvest are known.

TEK: The Hydaburg petition exhibit states that: "From Lime Point to Hassiah Inlet including Nutkwa Inlet and Keete Inlet is claimed by Ben Duncan and Robert Cogo" (USDOI 1944). It goes on to list Ben Duncan as the owner of the stream at Keete.

R. Sanderson characterization: "This is a small system with limited information from elders or historic documents. On one occasion, I obtained 60 sockeye from here. I accompanied James Edenso, Fred Grant and another elder to the site on that occasion."

Field observations: Observations were made on the Keete Inlet stream by foot in July 2007 and by air in September, 2007. Field observations were made at the sockeye stream on the left hand side of the head of Keete Inlet on July 18, 2007. No sockeye salmon were observed in the bay or estuary of the stream. Tony Christianson walked up the outlet stream for approximately 200 yards but did not observe salmon of any kind. There were no blockages or beaver dams observed. Aerial observation of the Keete system took place on September 9, 2007; no blockages or dams were noted on the outlet stream; however, a beaver dam was identified just above the outlet to the lake of the tributary stream (see below).

Figure 36 Robert Sanderson discussing traditional ecological knowledge of the Keete Inlet sockeye salmon system

Figure 37 Estuary of sockeye salmon system at the head of Keete Inlet

Figure 38 Beaver dam located on Keete tributary stream just above lake outlet

Figure 39 Keete Inlet – sockeye system is located at the head of the bay on the stream with the lake.

Klakas ***Haida: tla kaas (from Tlingit)***
Klakas Inlet is a narrow fjord oriented northeast/southwest which extends fifteen miles from its head to its entrance into Cordova Bay.

ADG&G District and Number: 103-15-027 Lat N 54° 08' 19" Long W131° 60' 64"
Area: Klakas Lake sockeye system is located on the east side of Klakas Inlet, ten miles northeast from Cordova Bay.

Distance from Hydaburg: Klakas Lake is approximately 30 miles southeast of Hydaburg.

Biological Data: Several weir counts at Klakas were thought to have been made in the mid-1930s but data from them were not identified. Orrell et al. (1963) report that federal biologists made observations at Klakas on six occasions between 1950 and 1962. They reported seeing sockeye salmon on only two occasions; in August 1959, 7,000 sockeye salmon were reported above the falls. Edgington et al. (1981: 157-159) provide a sketch map of the outlet system estimating that the tidal falls are thirty feet high at low water. During high water they are perhaps ten feet in height. Moser (1899:71) estimated it as "about 20 feet." Edgington et al. (1981) provide a sketch of the course of the outlet stream that shows a very open stream with no blockages and no evidence of beaver dams, either old or new. The peak sockeye escapement estimate provided by Edgington et al (1981:160) 13,000 on August 17, 1960. However from 1965 through 1980, no sockeye were ever reported in the system even though visits occurred during the prime period of mid to late August.

Precontact salmon harvesting technology: No evidence of precontact harvesting technologies were found in the estuary of Klakas nor in the stream above the falls. None have been reported.

Historic records of commercial harvest: Moser (1899: 70-71) was provided with substantial information on commercial salmon production from Klakas by the superintendent of the Hunter's Bay cannery.

Table 8 Klakas Salmon Harvests: 1887-1897

Year	Harvest Date	Species	Number	Cannery
1887	July 3-Sept. 13	Sockeye	6,960	Klawock (KL)
1888	July 11-31	Sockeye	2,370	KL
No data but likely that harvests occurred				
1896	July 1-31	Sockeye	3,932	Hunter's Bay (HB)
		Humpbacks	1,269	HB
	Aug. 1-30	Sockeye	3,382	HB
		Humpbacks	31,200	HB
		Coho	417	HB
	Sept. 1-20	Coho	2,657	HB
1897	July 4-Sept. 26	Sockeye	23,330	HB

Source: Moser 1889: 71

Moser (1899:71) was told that an average capacity for Klakas was considered to be 7,000 sockeye salmon.

TEK: The Hydaburg Petition, Haida expert testimony at the Hanna Hearings and Claude Morrison in his TEK interview all indicate that Edwin Scott of Klinkwan, a member of the Yakulanaas lineage, was the owner/trustee of Klakas in the late 19th and early 20th centuries. Concerning Scott's role and relationship with the canneries, Sam Davis (USDOI 1944) testified at the Hanna hearings in Hydaburg that:

> "The fact of the matter is that I fished with one man myself who got paid at Klakas. …Edwin Scott was his name. I fished with him. I didn't see the money handed to him, but I fished with him, and I saw him with the superintendent of the cannery, and he told me afterwards that he got so much money for the use of his place – for the use of his stream."

Davis made the following additional comment on Scott's decision making as the Klakas stream owner in his relations with the Hunter's Bay cannery:

> "When he was hired by Hunter's Bay, he refused to put up those wire nettings across there to keep those salmon from going up the river, and I refused to do it and I got discharged."

R. Sanderson characterization:
"Klakas Lake stream is located midway up Klakas Inlet on the eastern shore. The stream drains Klakas Lake. A small village was located at the mouth of this stream. The village was occupied to the time of creation of Hydaburg was established in 1912 as a summer village and subsistence camp utilizing salmon from the Klakas Lake system. Remains and ruins of old buildings are still identifiable at the site. Edwin Scott and his family, the clan leader at the time of the move to Hydaburg, occupied the site in summer. There was a deed to the site similar to the that of the Natkong family at Eek Inlet. This deed was lost during the time that Tlingit and Haida Central Council was involved in pursuing litigation to settle aboriginal rights in southeast Alaska.

The stream produces sockeye, pink, chum and coho salmon. The run of sockeye salmon probably amounted to 8000 fish in historic times. However, at present, escapements have been estimated at 2000-3000 annually with about 150-200 being harvested for subsistence during the last few years.

This lake is a poor producer for the size of the lake and surrounding watershed. Sockeye are present during the month of July.

Falls and a series of rapids are located at the mouth of the outlet stream when it enters salt water. The falls are impassable to salmon, except for period of extreme high tides, coupled with sufficient flow water in the streams. This creates a real problem for sockeye salmon in July; however in September, extreme high tides occur at which time, pink, chum and coho can ascend the falls. The falls present difficulty primarily for sockeye due to fact that they arrive in July. On one occasion during the mid-1980s, I traveled with several families to Klakas to attempt to harvest sockeye salmon. Upon our

arrival at low tide, we observed an estimated 1500 to 2000 salmon milling in several schools in bay and estuary. As they tide rose, we were able to observe many of the salmon as they approached the falls. We noticed that many of them had bruises, abrasions and cuts apparently the result of endeavoring to jump over the falls and striking on rocks as they fell back (see Figure 41). I have never seen this on any other sockeye system. Later we made a set and caught 186 sockeye. Following our successful set, we walked up to the falls and observed the salmon trying to leap over them. During our period of observation, no sockeyes were successful in making it up the stream. Often they would fall back into the water, apparently dazed as the swam listlessly on top of the water. Many of these were scarred and beat up as we had observed in the estuary. Several of our party ascended the stream above the falls and came upon a rapids. About 200 yards above the rapids we came upon a large pool. We observed about 10 salmon in the pool.

I have participated in commercial seine fisheries in Klakas Inlet several times in the past. The seine openings usually occurred during the last week of July. Very few red salmon were caught due to the timing of the run and the fact that the area near Klakas Lake stream was closed.

Since 2000, probably about 100 sockeyes on average have been taken from Klakas by Hydaburg residents."

Historic impacts: Klakas was one of the primary sources of sockeye salmon for the saltery and cannery that operated at Hunter's Bay. In 1897 Moser's crew observed a barricade at Klakas located at the top of the falls further impeding the movement of salmon up into the stream and lake. The productivity of the Klakas Lake system may have been damaged by this activity.

Recent subsistence use: Klakas has received occasional use by Hydaburg residents for sockeye subsistence harvests since 2000. Such use is usually associated with low abundance at Hetta and Eek.

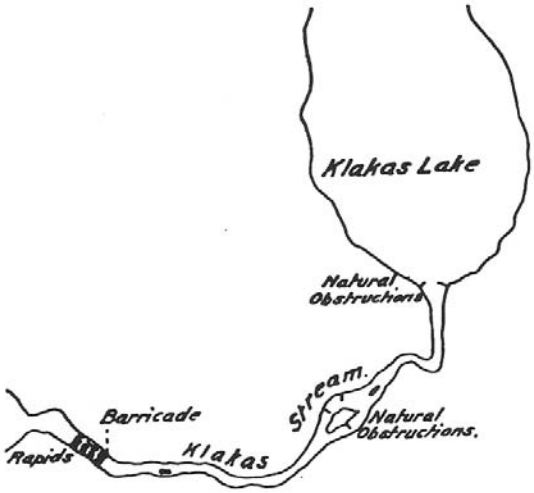


Figure 40 Sketch of Klakas sockeye system (Moser 1899)

Figure 41 Barricade located at the tidal falls of the Klakas outlet stream observed in 1897 (Moser 1899)

Field Observations: The Klakas system was observed by field visits in July 2007 and August 2008. Aerial observation and landing occurred on September 9, 2007. On July 16, 2007 a field visit to Klakas Inlet was made by Robert Sanderson, Steve Langdon and Gideon Duncan. Several jumps and finners were observed during the approach to the stream. Examination of the bay and estuary revealed no salmon. We observed the falls for approximately 15 minutes and did not observe any salmon jumping at the falls during that time. Aerial observation including landing on Klakas Lake near the outlet was conducted on September 9, 2007. Tony Christianson walked several hundred yards up the lake tributary stream and observed numerous schools of sockeye salmon (interspersed with some pinks) at various intervals. He estimated that at least 2,000 sockeyes were in the tributary system. He also observed numerous spawned out carcasses of sockeye salmon. An additional 200-300 sockeyes were observed at the mouth of the tributary stream preparing to enter the tributary stream. All of them appeared to be red or darker in color (see Figure below). Contact with ADF&G was made to report observation of salmon; they estimated 3600 escapement in the system. On August 8, 2008, field observation in Klakas Inlet and estuary was conducted. Robert Sanderson and Steve Langdon observed numerous salmon schooling in the estuary and abundant numbers of salmon jumping and attempting to pass up the falls.

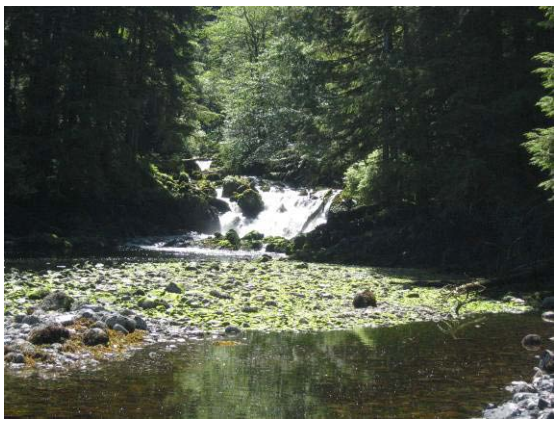


Figure 42 Falls at the tidal entrance of the Klakas Lake outlet stream, July 2007

Figure 43 Sockeye salmon in Klakas lake stream, September 2007

Figure 44 Klakas Lake sockeye system – red arrow shows tidal outlet area of observations and black arrow shows tributary outlet area of observations.

Hunter's Bay ***Haida: taa kúu***
Hunter's Bay is a located north of Cape Chacon on the southwest coast of Prince of Wales Island.

ADF&G District and Number: 103-11-017 Lat N 54° 86' 97" Long W 132° 29' 47"
Area: The sockeye salmon system outlet stream is located at the eastern head of Hunter's Bay.

Distance from Hydaburg: Hunter's Bay is located approximately 30 miles southeast of Hydaburg.

Biological data: Federal records show that Hunter's Bay Creek was visited in 21 of 22 years between 1940 and 1962 (Orrell 1963). In only two years (1948 and 1962) are sockeye salmon noted as being observed with the largest number being 1,000 in 1948. Edgington et al (1981) provide a sketch match of Hunter's Bay stream to the lake. No evidence of beaver dams is noted. The stream is wide and relatively unaffected by tree fall. While the system is not listed as being a sockeye producer, on four occasions from 1961 to 1980, sockeye were reported in the system with the highest reported number being 200 in August, 1963. None were reported after 1972.

Precontact salmon harvesting technologies: Hunter's Bay sockeye stream estuary is the site of the remains of the largest precontact salmon harvesting system identified in the K'iis Xaadas region to date. Located on the southshore of the stream estuary, the site is approximately 150 yards long. It is primarily located on an abrupt intertidal slope that rises at a sharp angle from the estuarine stream and flattens on the top where the terrace extends toward the treeline. The site is defined by numerous (in excess of 100) carved wooden stakes appearing both randomly and in alignments. At the upper end of the site near the stream mouth, it appears that former lattice walls or other forms of construction have fallen over and now appear as matted layers. Arranged in shallow diagonals from the stream to the flattened terrace are five alignments consisting of large posts spaced at approximately three foot intervals up the side of the channel. These may have been the base to which lattice walls were attached. The site has been dated to the same time frame as the Nichols Bay intertidal wood stake site, between 2200-2400BP (Fifield PC). No other archaeological investigation has been conducted on the site.

Figure 45 Wood stake salmon harvesting system on south shore of Hunter's Bay

Figure 46 Carved stake in the Hunter's Bay estuary

Figure 47 Matted, layered areas of the Hunter's Bay intertidal salmon harvesting system. The tops of large wooden posts can be seen in the left central part of the photo as indicated by the arrow.

Historic commercial harvest records: Moser (1899) reports that this is the second most important stream to the Hunter's Bay cannery in terms of sockeye production exceeded only by Hetta. Moser (1899) indicates that Mr. Miller believes the Hunter's Bay stream should yield 50,000 sockeyes annually. No other published data on salmon harvest from Hunter's Bay are known.

Table 9 Hunter's Bay salmon harvests: 1896-1900

Year	Harvest Date	Species	Number	Cannery
1896	July 10-31	Sockeye	5,318	HB (Hunter's Bay)
	July 10-31	Humpbacks	4,937	HB
	Aug. 1-31	Sockeye	2,300	HB
		Humpbacks	80,845	HB
		Coho	4,836	HB
	Sept. 1-20	Coho	8,845	HB
1897	July 6-Sept. 26	Sockeye	3,848	HB
	July 24-Aug. 20	Coho	44,501	HB
1898 and 1899, no report of harvest				
1900	June 18-Aug. 10	Sockeye	100,198	HB
	July 17-Aug. 28	Humpbacks	589,787	HB
	July 31-Sept. 10	Coho	36,630	HB

Sources: Moser 1899, 1902

Figure 48 Hunter's Bay cannery in 1897 (Moser 1899)

TEK: The Hydaburg petition stipulates that "Hunters Bay was claimed by Alex Peele whose descendants are Clarence and Morris Peele." It should be noted that the "descendants" are Alex Peele's sons, not his nephews (Wright 2001). Exhibits in support of the petition elsewhere state that Alex Peele was the owner of Hunter's Bay stream (USDOI 1944).

Francis Carle (2007) noted that the fish from Hunter's Bay were similar in size to those from Hetta.

R. Sanderson characterization:
"Hunter's Bay is large stream with a large capacity for spawning of salmon species. It is a known sockeye producer that has contributed to both subsistence and commercial fisheries of Hydaburg residents. At the head of the long outlet stream are four lakes which are likely available for sockeye spawning but it is unknown whether they all support sockeyes. The original owners of the stream were residents of Klinkwan who worked with the Millers in establishing a saltery at Klinkwan. Haidas fished for the saltery and then the Hunter's Bay cannery until it closed. They first used beach seines and later came with purse seine vessels to catch sockeyes in the bay. The run occurs almost totally within the month of July. Due to its distance from Hydaburg, it has received less subsistence use by Hydaburg residents than Hetta, Eek, Klakas and Kasook. We don't know what the productive capacity of this system is due to a lack of systematic harvest by Haida fishermen. There is wide variation in reports about what the system has produced in recent years and what it might be capable of producing. However, in good years there is probably substantial production from the system, exceeding Eek and Klakas but not as much as Hetta."

Historic impacts: Extremely heavy harvesting of Hunter's Bay sockeye occurred in early cannery period. Moser (1899, 1901) does not record a barricade in the system. It was considered by the Haida witnesses at the Hanna hearings to be one of the streams most damaged by the cannery fish traps (USDOI 1944). It also was heavily utilized in the first half of the 20th century by purse seine fishermen who made their catches in the bay.

Recent subsistence use: Hunter's Bay has been an occasional producer of subsistence sockeye harvests for a few K'iis Xaadas families since 2000. It has been particularly important during times when quantities available at Hetta are low.

Field observations: Hunter's Bay was visited on foot in July 2007 and August 2008. Aerial observation of the system occurred in September 2007. On July 18, 2007, field investigation of Hunter's Bay by vessel occurred. Several jumps were seen far out in the bay away from the estuary. Tony Christianson ascended the system for approximately half a mile and observed no salmon and no blockages of the system from tree falls or beaver dams. R. Sanderson commented that it appeared that the runs were arriving late in keeping with the colder weather experienced in the spring of the year; he estimated 1500 salmon were laying in the intertidal zone. Tony Christianson ascended the system for approximately half a mile and estimated 300 salmon in a pool immediately above the high tide line. On August 8, 2008 field visit, several schools of salmon were seen swimming in the bay and a number of jumps thought to be sockeyes were observed in the bay as well. During the aerial observation of Sept 13, 2007, no salmon were observed but the dark water of the streams and lake made viewing difficult. A possible beaver dam was sited in the upper portion of the drainage. At the outlet of the stream below Hessa Lake, a salmon jump was observed. R. Sanderson commented that there is a complex system of water connections between Hunter's Bay, Hessa and Nichols Bay and actual drainages from these areas may shift from time to time.

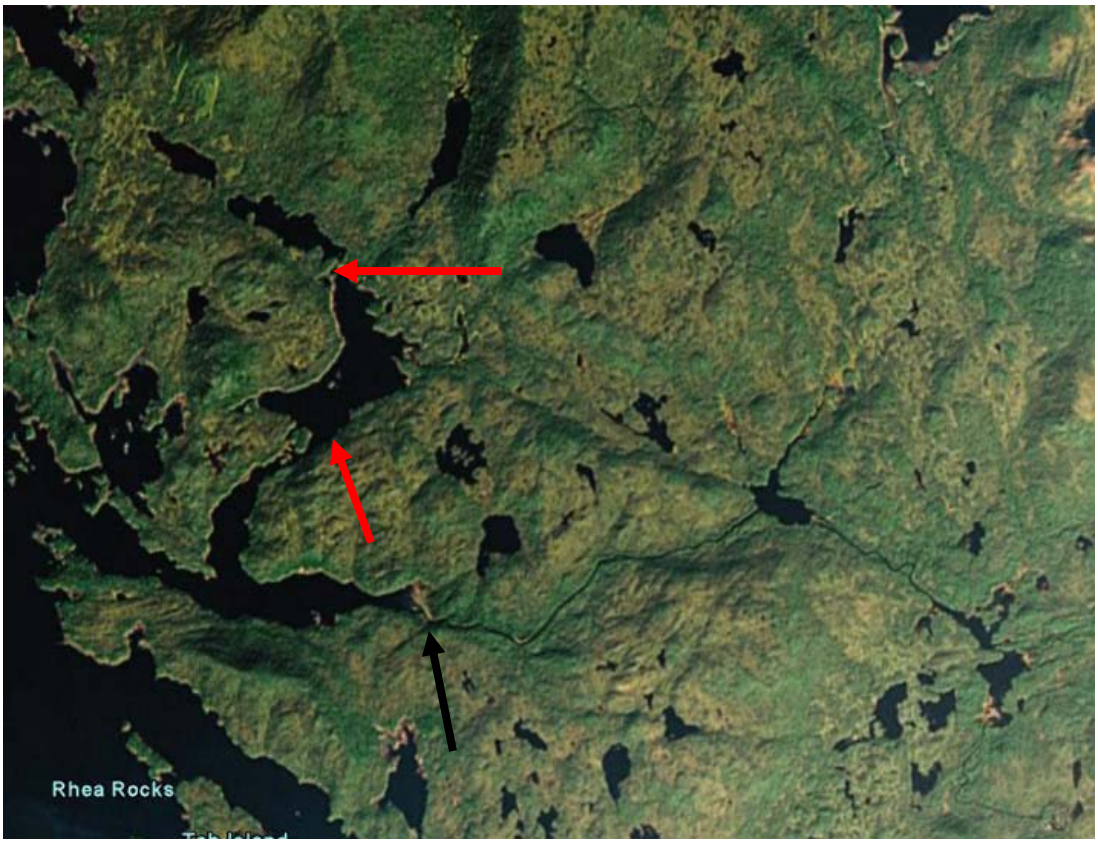


Figure 49 Hunter's Bay (black arrow) and Biscuit Lagoon (red arrows) Sockeye salmon systems

Biscuit Lagoon ***Haida: unknown***
Biscuit Lagoon is an arm of Hunter's Bay extending north approximately a mile and a half from the entrance to Hunter's Bay.

ADF&G District and Number: 103-11-015 Lat N 54° 89' 30" Long W 132° 34' 50"
Area: The sockeye stream in Biscuit Lagoon is located two miles north of Hunter's Bay on the right hand side of the arm. It can be entered only at high water as currents are strong and there are numerous rocks in the area. Another sockeye stream may possibly exist at the extreme upper end of the lagoon.

Distance from Hydaburg: Biscuit Lagoon sockeye stream is approximately 32 miles by boat south of Hydaburg.

Biological data: Edgington et al. (1981) do not record any observations of sockeye and do not list Biscuit Lagoon as a sockeye system. The sketch map of the outlet stream shows no blockages and no evidence of beaver dams. The tributary stream is located on the upper east side of the small lake.

Precontact salmon harvesting technology: There is no report of precontact harvesting technology at Biscuit Lagoon.

Historical records of commercial harvest: Moser (1899:70) writes: "Below the cannery [Hunter's Bay] an arm makes to the northward from the bay. At the end of this arm is a narrow passage, or 'skookum chuck,' as it is called in this country leading into a bay which received a small stream carrying a few redfish; it was barricaded." This is the only published historic report concerning sockeyes in Biscuit Lagoon. Moser does not report any harvest figures for the system.

TEK: No information was provided by interviewees or in the Hanna hearings on this system.

R. Sanderson characterization: "This is a very small system about which little is known. I was once in the area with Fred Grant who reported that sockeye were available both in the upper area above the second chuck and in the stream known as Biscuit Lagoon on the right hand side. Occasionally reports are received of jumps in the lagoon in front of the stream."

Historical impacts: The barricade reported by Moser (1899) is likely to have led to a reduction in the sockeye salmon production of the Biscuit Lagoon system.

Recent subsistence use: No subsistence harvests of sockeye salmon from this system have been reported in recent years, since 2000.

Field observations: No field visits were made to Biscuit Lagoon. During the aerial observation on September 13, 2007, no salmon were observed. A beaver dam was observed immediately above the upper system in the lagoon.

Hessa ***Haida: Hessiah (maybe from Tlingit)***

Hessa Inlet is located on the southwest coast of Prince of Wales Island approximately 12 miles from Cape Chacon.

ADF&G District and Numbers: 103-11-025 and 027 Lat W 54° 90' 30" Long N 132° 31' 00"

Area: Hessa Inlet is accessed by a narrow salt chuck opening from Cordova Bay. At the northeast end of the inlet are located two small streams within less than half a mile of each other that support sockeye salmon.

Distance from Hydaburg: Hessa Inlet is located approximately 30 miles southeast of Hydaburg.

Biological data: Orrell et al. (1963) has no information on either Hessa stream. No reports of sockeye salmon in either system are found in ADF&G salmon stream catalogues. Edgington et al. (1981:64) provide a sketch of one stream last visited in 1979 that indicates the location of "remains of old beaver" dam with a pool full of much debris immediately behind it. More significantly, it also indicates an active beaver dam immediately below the lake outlet at the time of observation. Coho were observed throughout the system including the lake.

Precontact salmon harvesting technology: No evidence of precontact harvesting technologies was observed at either stream and none have been reported.

Historical records of commercial harvest: Moser (1899:72-73) reports for 1896 that "…the superintendent stated that about 2,000 redfish [sockeye] were also taken. Mr. Miller states that Hessa formerly yielded about 12,000 redfish but probably it would not yield that number now." Sockeyes had apparently been harvested from the Hessa streams for the Miller saltery at Hunter's Bay. No other published records of commercial harvests have been identified.

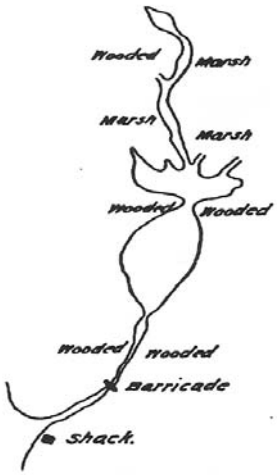


Figure 50 Barricade and shack at Hessa, 1897 (Moser 1899)

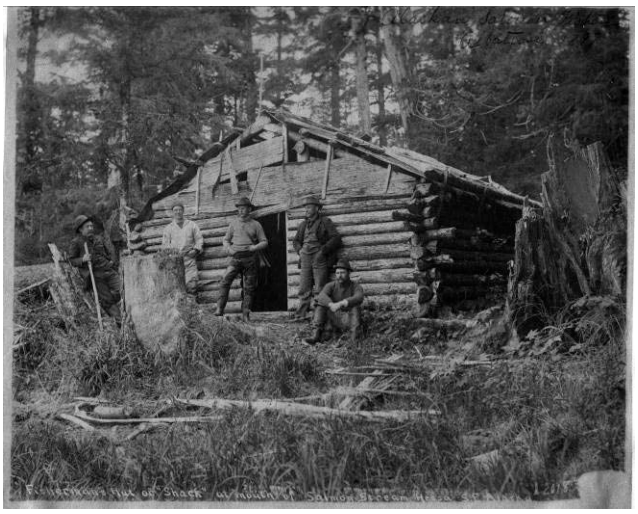


Figure 51 Hessa camp with fishermen (Moser 1899)

TEK: In the K'iis Xaadas submission concerning territories and fishing rights for the Hannah hearing, an old man known as Okeete was identified as the owner of the system prior to his death (USDOI 1944).

R. Sanderson characterization: "Hessa Inlet is known to have two producing sockeye systems. The lakes in each system are approximately a mile from tidewater. It was utilized by Klinkwan families and known for abundant coho in addition to sockeyes. Commercial catches were made of sockeyes and cohoes by Haida purse seiners. In my lifetime, I am not aware of any subsistence harvest taken by Hydaburg residents from this system."

Historic impacts: The establishment of the barricade on at least one of the Hessa sockeye streams during the early commercial fishery first for the saltery and subsequently the cannery at Hunter's Bay appears to have greatly reduced the original sockeye salmon productivity of these relatively small systems. Moser (1899: 72) noted:

> "In the outlet, at the head of tide water, is a barricade across the full width of the stream built in the usual manner, but with the addition of 2-inch-mesh wire netting, the whole forming an effectual obstruction that not a single fish can pass upstream."

Figure 52 Stream barricade on sockeye stream in Hessa Inlet, 1897

Recent subsistence use: It is unknown if there has been any sockeye taken for subsistence by K'iis Haida since 2000. None have been reported.

Field observations: Hessa Inlet was visited by vessel for ground observation in July 2007 and by aerial observation in September 2007. On July 18, 2007, Tony Christianson hiked up the north fork of the stream for several hundred yards but did not reach the lake. There were no blockages observed. No sockeye salmon were observed. On September

14, 2007, observation of the Hessa Inlet streams during an aerial flyover showed no blockages of the streams due to beaver dams and no salmon were observed in the systems.

Figure 53 Hessa Inlet sockeye stream on the left hand side of the inlet – R. Sanderson providing traditional ecological knowledge of the system.

Figure 54 Hessa Inlet with arrows showing locations of sockeye salmon streams

Nichols Creek (head of Nichols Bay) ***Haida: possibly Sii*** **(USDOI 1944)**
Nichols Bay is a four-mile long narrow embayment with the sockeye stream, Nichols Creek, flowing into the bay at its northwest head.

ADFG District and Number: 102-10-60 Lat N 54° 44' 48" Long W 132° 10' 03"
Area: This system is located at the southern tip of Prince of Wales just west of Cape Chacon.

Distance from Hydaburg: Nichols Bay is located approximately 40 miles southeast of Hydaburg.

Biological data: Nichols Bay is considered a large system with at least four tributaries above the lake with areas available for sockeye spawning. Total spawning area is 1620 meters squared. Novak (1975b:57) reported three years of observations with a peak escapement count of 3,000 sockeyes reported on July 22, 1957. The run is normally expected to peak in early to mid-July. He reported no beaver dams or blockages due to blowdowns during their field observations in August 1979.

Precontact salmon harvesting technology: The intertidal zone of Nichols Bay Creek provides evidence of two different precontact harvesting methods. Forest Service archaeologist Terry Fifield identified approximately 20 wood stake in the lower portion of the intertidal estuary. The stakes were flush to the surface in the estuary and interspersed among rocks (see Figure 55). They were not arranged in any identifiable pattern. A radiocarbon date from one stake was reported as 2340 +/- 60 BP (Fifield PC). These stakes were not identified during the field observation on July 19, 2007 likely due to their lack of extension above the estuary stream surface. The second precontact salmon harvest methodology identified in the upper portion of Nichols Bay were possible stone alignments on the west shore running from the lower to the upper portion of the intertidal zone (see Figure 56).

Figure 55 Wooden stakes located in the estuary of Nichols Creek. Photo by Terry Fifield

Figure 56 Possible remnant stone alignments located in the intertidal zone of Nichols Bay near the Nichols Creek estuary

Three possible semicircular stone traps were identified along the west shore of the estuary. In addition, four or five linear alignments were observed along the west shore intermittently spaced between the arcs. The structures were only remnants and not fully identifiable, integrated structures as are observable elsewhere in the intertidal areas near streams on the west coast of the Prince of Wales Archipelago (Langdon 2006, 2007).

Historical records of commercial harvest: Moser (1899:77) provided the following data obtained from the Superintendent of the Hunter's Bay cannery about commercial salmon harvests from the waters of Nichols Bay.

Table 10 Nichols Bay Salmon Harvests, 1896-97

Year	Harvest Date	Species	Number	Cannery
1896	July 10-Aug. 31	Sockeye	31,192	Hunter's Bay
	Sept. 1-20	Coho	550	Hunter's Bay
1897	July 6-Aug. 31	Sockeye	11,218	Hunter's Bay
	Aug. 16-31	Coho	1,313	Hunter's Bay
	July 24-Aug. 20	Humpback	54,772	Hunter's Bay

Source: Moser 1899: 72

Moser indicates that sockeyes from Nichols Bay were large, averaging nearly 8 pounds (Moser 1899: 77). No other published reports of sockeye commercial harvests from Nichols Bay have been identified.

TEK: Traditional ownership and use information from records and documentary sources are unclear about who owned and used Nichols Bay. Kasaan sources cited in Goldschmidt and Haas (1998: 174) assert it was owned by Kasaan while Frank Nix (see below) indicates that the K'iis Xaadas conducted the early commercial saltery phase harvests from Nichols Bay. During the 1944 hearings, several of the Haida witnesses reported customary and traditional harvesting at Nichols Bay prior to the onset of the commercial fishing era. Frank Nix stated: "There is Klakas, Hessa, Hunters Bay and Nichols Bay. He says Klakas was the first one, and then Hessa, Hunters Bay and Nichols Bay around Cape Chacon" (USDOI 1944). Elder/experts Claude and Woodrow Morrison reported commercially seining in Nichols Bay on several occasions during their lifetime.

R. Sanderson's characterization of the system: "Nichols Bay is located at the southern end of Prince of Wales Island near Cape Chacon. Historically, prior to the 1900's the Nichols Bay subsistence site was utilized by people from Kasaan and Klinkwan. They established a seasonal fishing village on the northside of an island at the entrance to Nichols Bay. When commercial fishing started in this area, directed fishing for sockeye and silver salmon was established in this area. Nichols Bay was among the first to be utilized for commercial production. The sockeye were harvested for a saltery and then for canning, canneries being located in Hunter Bay and Klawock. The Nichols Bay stream produced a substantial sockeye run, with a peak harvest of over 30,000 sockeye on a yearly basis."

Historical impacts: Three elders testifying at the Hanna Hearing held in 1944 reported that Nichols Bay was a traditional fishery of the K'iis Xaadas (USDOI 1944 vols I-III). George Haldane reported fishing for Alec Miller's saltery, located at the head of the bay, for one season. The date of the opening of the saltery was given as 1889 but no date of closure was provided. By the time of Moser's 1897 visit, the saltery had been abandoned and was in dilapidated condition (Moser 1899: 70). During their visit, Moser's crew discovered a barricade constructed of a large log fallen across the stream with smaller logs closely placed side by side on the upstream side of the fallen log. The butts of the angled logs were driven into the stream bed which minimized the possibility of their displacement during high water outflow conditions (see Figure 57). The extension of the logs over the downstream side also would have contributed to the prevention of sockeye movement upstream. The barricade so constructed likely obstructed virtually all upstream movement of sockeye or other species of salmon. Such barricades were in fact outlawed by federal regulation in 1896 and so Moser had them removed. The "Albatross" vessel log report for June 13 states that the "Gig left the ship with party to destroy barricade across stream entering lake at head of Nichols Bay." However, Moser (1899) reports that they were only able to remove the smaller logs on top and were not able to budge the larger log spanning the stream and used as the foundation.

Figure 57 Barricade in Nichols Bay stream identified and partially removed by crew of the Bureau of Fisheries vessel "Albatross" in 1897

Recent subsistence use: No reports of recent subsistence harvests by K'iis Xadaas of sockeye salmon from Nichols Bay are known.

Field observations: In July 2007 a field visit on foot was made to Nichols Bay creek and in September 2007 aerial observation of the system was made. On July 17, 2007 field observations were made in Nichols Bay, the estuary and stream. As we traveled into the bay, we observed four salmon jumps that were thought to be sockeyes heading toward the

upper bay. No salmon were observed schooling, or in the estuary. Tony Christianson hiked up the stream to the lake outlet. There were no blockages or beaver dams observed and no salmon either. Aerial observation on September 9, 2007 was difficult due to the dark water in the outlet system; however no beaver dams or salmon were observed.

Sanderson and Langdon were dropped off at Bean Island to visit the site of the former seasonal camp village located on the backside of a small island inside Bean Island at the entrance to Nichols Bay.

Figure 58 Nichols Bay sockeye system near Cape Chacon on Prince of Wales Island

Sukkwan Island sockeye stream information
Sukkwan Island is a pear-shaped island in upper Cordova Bay located to the west of Prince of Wales Island. It is approximately fifteen miles north to south and nine miles east to west at it widest point. The island is immediately across Sukkwan Strait from the village of Hydaburg and the northwest point was the location of the traditional village of Sukkwan. There are two sockeye systems on the island used by the K'iis Xaadas known locally as Coffee Chuck and Kasook.

Coffee Chuck ***Haida name: unknown***
Coffee Chuck is a small sockeye system located on Sukkwan Island.

ADF&G District and Number: 103 no number Lat N 55°13'16" Long W 132°41'77"
Area: Coffee Chuck is located on the lower east side of Sukkwan Island.

Distance from Hydaburg: Coffee Chuck is located about 11 miles south of Hydaburg and is the closest sockeye system to the village.

Biological data: The stream is not documented in any federal or state stream catalogues.

Precontact salmon harvesting technology: No visitation to the stream occurred so no observations were made concerning precontact salmon harvesting technologies.

TEK and R. Sanderson's characterization: "Coffee Chuck is the local name for a small stream located on eastern Sukkwan Island, almost directly west of Lime Point on Prince of Wales Island. It is located just south of a small island on the chart called Grass Island. The stream's tidal outlet is exposed to easterly and southerly winds, with a small, prominent beach. The stream drains a small lake, which produced a small run of sockeye in the past together with other species of salmon. Sockeye salmon have been observed in the past during the month of July. Perhaps 200 sockeye were caught by one or two individuals for subsistence purposes. The total run was probably a few hundred fish to 1000 at maximum. I myself, along with Ed Sanderson, Neil and Brady Edenshaw, on two occasions caught 70-80 sockeye from Coffee Chuck. We made these catches in July. These sockeye looked different from Hetta fish. I refer to them as "Green backs" due to the greenish appearance in their coloration. Probably the total subsistence catch did not exceed 300 in any year. However, I have not observed any sockeye recently at Coffee Chuck Creek. Several years ago, I flew from Hydaburg to Long Island and from the plane observed a beaver dam just below the lake outlet. I am not sure, at the present time, that there are any sockeye left in the system. Possibly a remnant population of sockeye may still be present. The run occurs in July."

Historical impacts: Due to the small size of the system, it is possible that early commercial harvests and later interception of the fish in purse seine fisheries may have reduced the run.

Recent subsistence use: No subsistence harvests from this system are known to have occurred since the 1990s.

Field observations: Coffee Chuck was not visited on foot due to the inability to land in rough waters in both 2007 and 2008. During the aerial flyover, it was not possible to see the stream as a result of the dense forest blocking vision.

Figure 59 Coffee Chuck sockeye system on Sukkwan Island across Sukkwan Strait from Lime Point

Kasook ***Haida: Kasúuk (possibly from Tlingit)***
Kasook Inlet is located on the south end of Sukkwan Island. The sockeye stream has its outlet at the head of the left, western arm of the inlet.

ADFG District and Number: 103-40-058 Lat N 55° 01” 81” Long W 132°78’ 06”
Area: Southend of Sukkwan Island on the southwest side.

Distance from Hydaburg: It is approximately 15 miles to Kasook from Hydaburg traveling west out of Hydaburg and down the west coast of Sukkwan Island.

Biological data: Federal records indicate that Kasook was considered to support sockeye but it was only visited once and no sockeyes were reported (Orrell et al.1963). Edgington et al. (1981: 639-642) reported visiting the stream on August 21, 1979. No other visit has occurred to the stream since 1952. Water temperature was reported as 75° quite high for a lake system and perhaps indicative of shallowness. A number of log jams associated with blow downs were noted although none were identified as blocking fish access at any point along the outlet stream. In the intertidal zone, 100 sockeye and 150 pinks were reported to be milling. No salmon were noted in the stream or at the lake outlet.

Precontact salmon harvesting technology: Remnants of a likely stone weir were identified on both sides of the estuary at approximately the mid-tide level. Edgington et al. (1981: 642) reported and pictured a small, well constructed stone weir near the mouth of 103-40-060, a small stream on the north shore of the east arm of Kasook Inlet.

Figure 60 Possible ancient stone weir or trap in Kasook stream estuary; arrow indicates location of remnants of a possible stone weir alignment identifiable on opposite sides of the stream in the estuary (see Figure 64 below).

Historical records of commercial harvest: Moser (1899:76) provides the following information on the late 19th commercial use of Kasook:

Table 11 Kasook Inlet Salmon Harvests, 1888-1897

Year	Harvest Date	Species	Number	Cannery
1888	July 11-24	Sockeye	1,829	KL
"few hundred in subsequent years"				
1896	July 1-31	Sockeye	1,340	HB
1897	July 14-Aug. 1	Sockeye	1,054	HB
		Sockeye	1,361	KL

Source: Moser 1899: 76

As indicated, sockeye were taken from Kasook by crews working for the Klawock cannery priory to the opening of the Hunter's Bay cannery in 1896. A saltery operated in Kasook Inlet for one season but was then abandoned (Moser 1899:76). No date of operation or harvests for the saltery were reported. No other published records of commercial harvests were identified.

Figure 61 Saltery located in Kasook Inlet, 1897

TEK: Francis Carle reported that he had obtained sockeyes for subsistence use from Kasook on several occasions. He reported of his harvest once at Kasook:

> "I noticed that one time boy, I felt kind of bad 'cause we had about maybe 450 sockeyes and I was watching all the ladies clean 'em and we were bringing 'em in on the 'Haida Maid". We had big bright lights on there and I was watching 'em clean 'em and almost 90% of the sockeyes were females…. I said we already killed em, can't bring em back" (Carle 2007: 6).

He noted that he had observed several sockeye jumps elsewhere in the inlet at the time. Robert Sanderson (2007: 12) commented:

> "When the Hetta run went down, people started to look at other creeks like Hunter's Bay and Kasook. The Kasook run was used for three or four years there and ran anywhere from 500- 1300. We kept records and then all of a sudden nothing, nothing, nothing, nothing and we find out later there is a beaver dam there."

Ben Young also reported that his family had come to Kasook on several occasions between 2000 and 2004 and harvested about 40 sockeyes on the most recent occasion.

R. Sanderson characterization: "Kasook is a small sockeye system that has contributed to subsistence harvests of various families through most of my life. Typically it might produce several hundred fish per year in total. I believe that the beaver have been building dams on the system since about 2000. The run occurs here in July."

Historic impacts: Kasook was first utilized for commercial salmon in the mid-1880s. It has been used at various times for subsistence by Hydaburg residents. The relatively small size of the system may make it vulnerable to over harvest, particularly in years of small runs.

Recent subsistence use: Robert Sanderson indicates that during 2002, one of the last weak years at Hetta, 400 are reported to have been taken from Kasook by Hydaburg residents. Robert Sanderson stated that as many as 1300 have been reported harvested from the system in a single year on one occasion in the 1990s.

Field observations: Kasook was visited twice on foot, in July 2007 and August 2008. Aerial observation took place in September 13, 2007. On July 13, 2007, Kasook Inlet and stream were visited by vessel from Hydaburg. No jumps, sockeye or otherwise, were observed traveling up the inlet. No salmon were observed in the lower portion of the stream. The field party proceeded up the stream to the location where Tony Christianson has observed a beaver dam. A dam was identified a short distance below the lake outlet in association with a several fallen logs. This appears to be in the same location sketched in Edgington (1981: 639). It was noted that the water level above the dam was considerably higher than below and that the water temperature was also higher. Stream flow below the dam was substantial but clearly would have been higher if the dam was not present. Tony Christianson, Marita Tolson, and Gideon Duncan spent approximately an hour pulling sticks, branches, and accumulated mud from the west end of the dam in an effort to open it up. An opening was created that immediately lowered

the water level behind the remainder of the dam and increased the rate of the stream outflow.

Figure 62 Tony Christianson removing portion of beaver dam on Kasook stream 50 yards below lake outlet.

On September 9, 2007, during aerial flyover, the dam in the upper portion of the outlet stream was identified. The opening created during the field visit was not apparent, but it could not be determined if the beavers had come back and rebuild the dam. In addition an even larger beaver dam was observed above the one removed during the field visit further up the outlet stream. No dam was identified on the tributary stream which enters Kasook Lake at the northend opposite the outlet streams. One fish was observed at the outlet of the tributary stream. In August 2008, the stream was revisited at which time it was observed that the opening had not been closed by beavers.

Figure 63 Outlet of Kasook Lake stream; arrow points to beaver dam identified and partially removed in July, 2007

Figure 64 Tidal estuary of Kasook Lake system; arrow shows possible stone weir

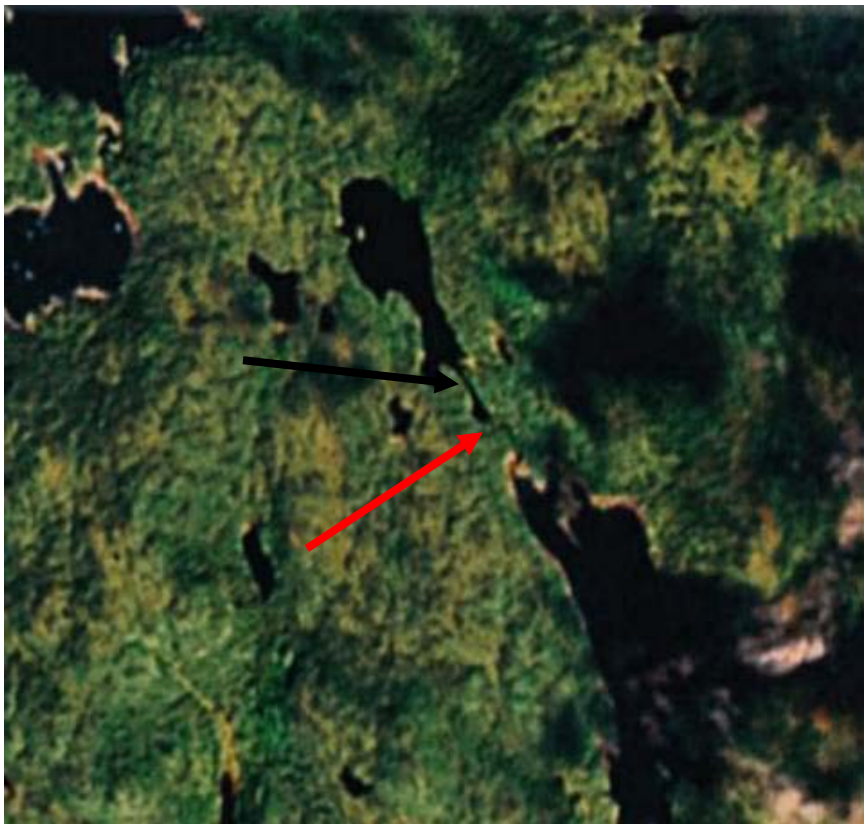


Figure 65 Kasook Lake system – arrows show location of beaver dams; red arrow is on dam opened and black on upper dam identified during aerial observation, Sept. 2007.

Dall Island
Dall Island is approximately 60 miles long and 20 miles wide. A range of mountains splits the island down the middle; the outer western coast is extremely rocky and rugged with numerous east-west embayments. Streams are short and steep and provide little spawning habitat. The sockeye systems identified according to customary and traditional knowledge for Dall Island are: Manhattan Arm, Devil's Lake, Welcome Cove, Port Bazan, Essowah Lake and Essowah Point.

Manhattan Arm ***Haida: unknown***
Manhattan Arm is the southern of two arms of Sea Otter Harbor located on the northwest side of Dall Island.

ADFG District and Number: 104-20-10 Lat N 55° 05' 53" Long W 133° 08' 28"
Area: Southshore near the east head of Manhattan Arm off Sea Otter Harbor.

Distance from Hydaburg: It is approximately 24 miles to the Manhattan Arm system from Hydaburg traveling north and then out through Meares Passage to the west coast of Dall Island.

Biological data: The system consists of a freshwater stream outlet from a small to medium size lake with one identifiable tributary to the lake. ADF&G records indicate that it a small to medium system with limited spawning area in the tributary stream. Only one ADF&G field observation of the system exists which occurred in late July, 1974. No sockeye were reported although the possibility of their presence is recognized (Novak 1975b: 48).

Precontact salmon harvest technology: No evidence of precontact salmon harvest technologies have been reported nor were observed during field investigations.

Historical records of commercial harvests: There are no records of commercial harvests from this system at anytime.

TEK: No specific TEK on this system was provided in the elder/expert interviews or documentary records. R. Sanderson provided the following characterization:
"This is a small to medium sockeye system in which fish [sockeye] return during the month of July which are followed by runs of pinks, silvers, and a few chums. The lake known as Manhattan Lake was and possibly still is, accessible by trail from View Cove on the eastern side of Dall Island, over a divide low in elevation. I myself have used the trail to travel to Manhattan Lake. Sockeye have been observed jumping in the bay in front of the stream in July by both commercial fishing boats fishing for salmon at Juel Point and Cape Lookout, and by persons looking for abalone. The stream is easily accessible by boat. The only problem might be severe weather in the Pacific Ocean preventing access to Sea Otter Harbor. Our principal informants on the Sealaska Historic Site investigation for this stream were Robert Sanderson, Delbert Nix, Ed Sanderson and George Hamilton Sr. Information was also obtained from William Wallace, Ed Hamilton, Harris Natkong Sr. and Gideon Duncan Sr. Sockeye were also reported by the

crews of the vessels Carolyn S, Haida Girl, and Haida Maid while at anchor in Sea Otter Harbor."

Historical impacts: Interceptions of salmon by purse seiners operating in the month of July on the outer coast of Dall Island may have occurred. Novak (1975b:48) reports that both sides of the outlet stream were logged but this was not apparent during our field investigation.

Figure 66 Intertidal section of Manhattan Arm sockeye outlet stream looking to salt water

Recent subsistence use: There is no known history of use of the system for subsistence during the lifetime of the elders interviewed.

Field observations: Manhattan Arm stream was visited on foot in July 2007 and by aerial flyover in September 2007. During travel down Manhattan Arm toward the stream, several jumps, identified as those of sockeye salmon were noted west of the stream near the south shore. Field observation of the system took place on July 13, 2007. About 100-200 sockeye were observed in the waters outside of the Manhattan Creek mouth at low tide. The sockeye observed were rather small of one age class probably four-year olds that spent two years in the ocean. Tony Christenson walked up the stream to its lake outlet. No salmon were observed in the stream, and no blockage nor obstruction of the outlet stream was observed. Aerial flyover of the system occurred on September 13, 2007. During the flyover, no salmon were observed in the lake or outlet stream. Approximately 100 yards above the tributary outlet into the lake, however, a beaver dam was observed which apparently could block the passage of sockeye salmon to spawning grounds above (see Figures 67 and 68).

Figure 67 Beaver Dam on Manhattan Arm lake tributary stream.

Figure 68 Blow up of beaver dam on Manhattan Arm stream

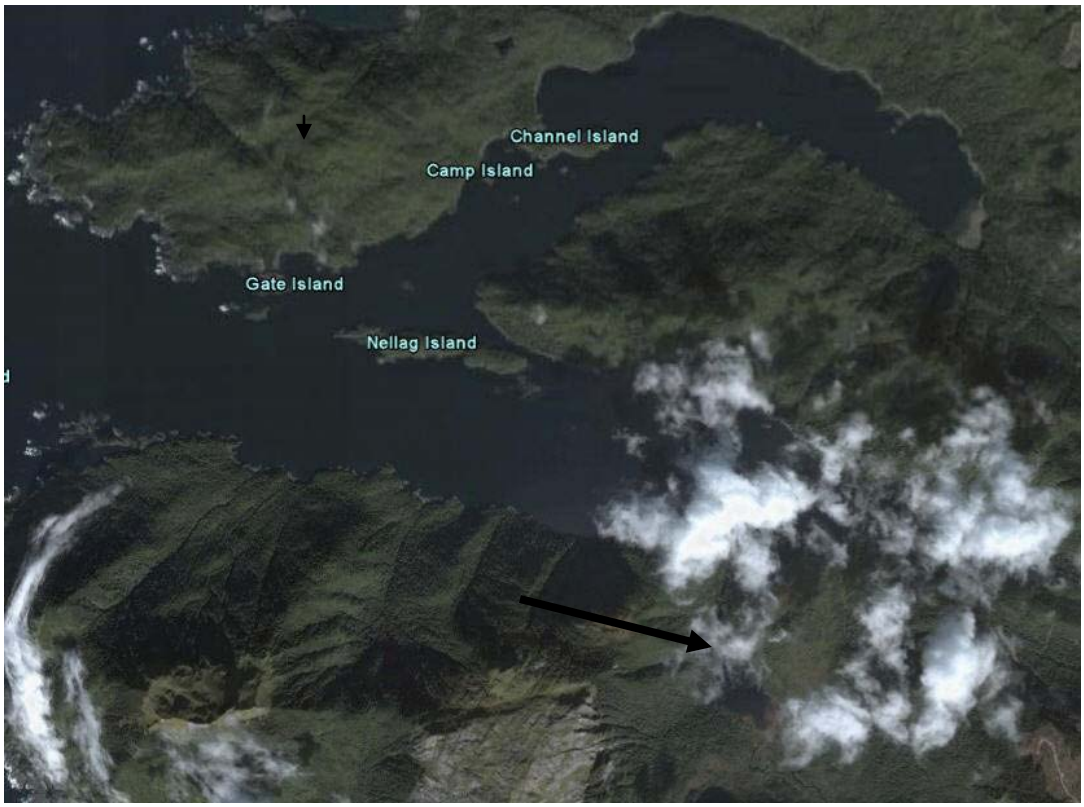


Figure 69 Manhattan Arm of Sea Otter Harbor. Arrow points to sockeye system which is mostly obscured by clouds.

Devil's Lake ***Haida: unknown***

Devil's Lake is a rocky, islet filled inlet located on the northwestern shore of Dall Island.

ADFG District and Number: 104-20-10 Lat N 55° 05' 53" Long W 133° 08' 28"
Area: The stream entrance at Devil's Lake is located at the north end of a rocky islet filled inlet on the northwest coast of Dall Island.

Distance from Hydaburg: It is approximately 30 miles to Devil's Lake from Hydaburg traveling north and then out through Meares Passage.

Biological data: Devil's Lake is composed of two sections, a smaller lower section and a much larger upper section that are connected by a short narrow channel (see Figure 65). The outlet system consists of a tidally influenced stream descending from a medium size lake with one identifiable tributary to the lake at the northeast end of the lake. ADFG records indicate that it a small to medium system with limited spawning area in the tributary stream. Only one ADFG field observation of the system exists which occurred in late July, 1974. No sockeye were reported although jumps observed in the delta area at the mouth of the tributary stream were thought to be sockeye (Novak 1975b: 65).

Precontact salmon harvesting technology: No evidence of precontact technologies have been reported or were identified during the field investigation.

Historical record of commercial harvest: There are no records of commercial harvests from this system at anytime.

TEK: No specific TEK on this system was provided in the elder/expert interviews or documentary records. R. Sanderson characterized the system and its use as follows: "Devil's Lake is located on the Central part of Dall Island, on the outer coast. The outlet stream from Devil's Lake to the Pacific Ocean is quite strong and tidally influenced. A small island, Devil's Island, sits in front of the outlet stream. Rocks, reefs, and kelp patches surround Devil's Island, and severely limit access during bad weather. At Camp Cove, the next embayment to the south, a short portage existed to Devil's Lake proper. This site is also very difficult to access in bad weather, heavy seas, and ground swell with rocks, reefs and kelp patches also in the area. The principal informant on Devil's Lake and stream during the Sealaska Historic site investigation was George Hamilton Sr. giving information as to the historic use as a subsistence site for sockeye salmon. There was a seasonal camp, apparently located on a sandy beach on the east side Devil's Island, from which utilization of sockeye runs through July could have occurred. Devil's Lake is a large lake, as large as Hetta Lake and could support a substantial sockeye salmon. The upper end of the lake is surrounding land is owned by Sealaska Corporation and was accessed by logging road from Coco Harbor, on the eastern side of Dall Island. The areas owned by Sealaska Corp. have been logged during the last three years. Possibly the lake can be accessed by the logging road. At any rate possibly the loggers presently working in Coco Harbor area could be interviewed as to sockeye present in the inlet stream."

Historical impacts: Interceptions of salmon by purse seiners operating in the month of July on the outer coast of Dall Island may have occurred. No other impacts are known other than the recent Sealaska Timber Corporation logging; what impact this logging might have on sockeye production is unknown.

Recent subsistence use: There is no known history of use of the system for subsistence during the lifetime of the elders interviewed.

Field observations: Devil's Lake stream was visited on foot in July 2007 and by aerial flyover in September 13, 2007. Field observation of the system took place on July 18, 2007. During travel into the waters at the outlet of Devil's Lake, several jumps, identified as those of sockeye salmon were noted near the mouth of the outlet stream near the north shore of the embayment. The tidal outlet was determined to be deep enough to take the skiff up however as we proceeded into the channel, the thickness of the heavily forested canopy and the strong outflow made it impossible to proceed. One salmon jumped immediately beside the skiff as we entered the channel. Tony Christanson left the skiff and walked up the tidal outlet stream to observe its lake outlet. However, the heaviness of the growth and steep, solid tidal channel prevented reaching the lake outlet. No salmon were seen, no blockage nor obstruction of the outlet stream was observed. Aerial flyover of the lake and two tributaries occurred on September 9, 2007. At the mouth of the primary tributary stream, several schools of salmon were observed finning and splashing. Following landing near the tributary outlet, several schools of sockeye and possibly pink salmon were observed. Due to inability to get to shore, it was not possible to investigate the tributary stream to determine its status or whether there were salmon in the stream.

Figure 70 Devil's Lake system showing recently logged areas on both sides of the northeast end of the lake.

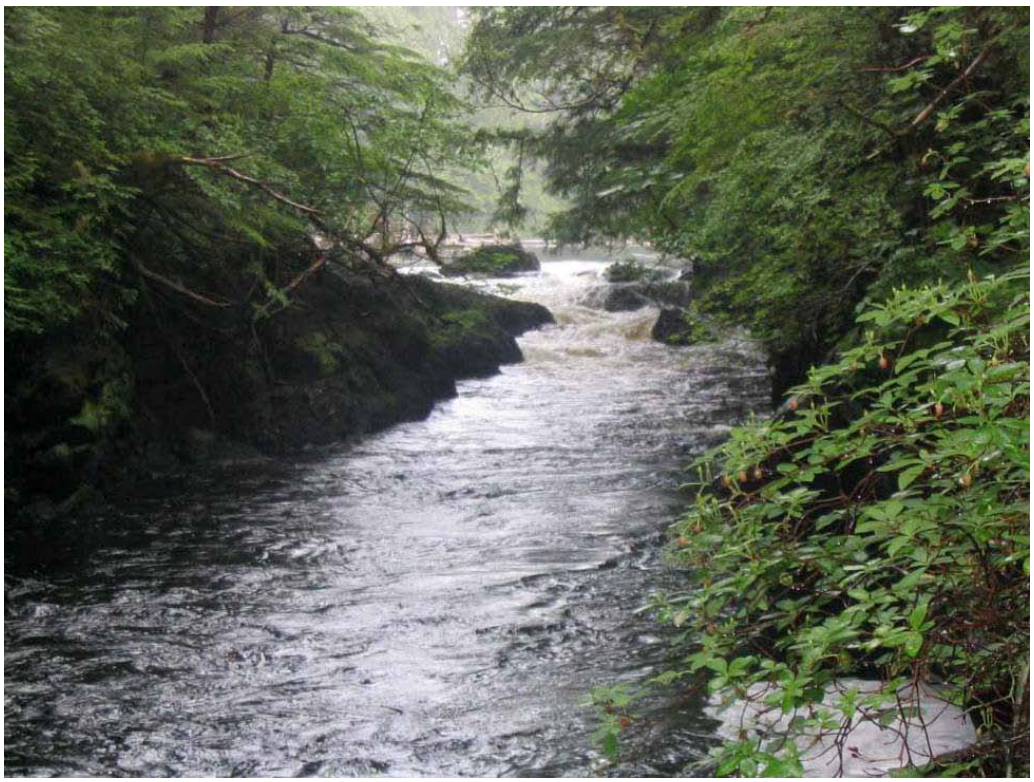


Figure 71 Devil's Lake outlet stream from lake into tidal outlet. Note steep gorge and rugged quality of stream channel

Figure 72 Devil's Lake tributary stream observed September 14, 2007 showing proximity of logged land

Figure 73 Sockeye salmon showing off Devil's Lake tributary stream

Welcome Cove ***Haida: unknown***

Welcome Cove is a small embayment on the west coast of Dall Island approximately three miles south of Devil's Lake. A single stream enters the cove in the northeast corner; it is the outlet stream from a small lake.

ADFG District and Number: 104-20-35 Lat W 54° 58' 46" Long N 133° 08' 44"
Area: Welcome is located on the west central coast of Dall Island.

Distance from Hydaburg: Traveling from Hydaburg out through Meares Passage, it is 42 miles to Welcome Cove.

Biological Data: The stream is considered small with limited potential for salmon production. No information on sockeye presence or probability, species observation or escapement estimates appear in the stream catalog (Novak 1975b: 68). Only one field observation of the system is reported having occurred in late July, 1974. The total available spawning area is estimated to be 1,149 square meters.

Precontact salmon harvesting technology: No evidence of precontact technologies were reported or observed in Welcome Cove.

Historical records of commercial harvests: There are no known published data on commercial harvests for Welcome Cove.

TEK: Harris Natkong Jr. reported making catches of several hundred sockeyes at high tide in front of the outlet stream in Welcome Cove on several occasions and 1200 on one occasion (Natkong 2007). Loren Sanderson reported catching 800 sockeyes on one occasion in the 1980s. R. Sanderson characterization: "Welcome Cove is located on the outer coast of Dall Island, facing the Pacific Ocean, approximately in the center of the island. Lake Welcome outlet stream drains into the northeast portion of the cove with a small waterfall which at high tide can be easily passed by salmon. Historically, this stream had a good sockeye run, and was utilized by the Haida People probably from Kaigani village, Koinglas and Howkan. It may also have been utilized by people living seasonally at Tlevak Narrows. In addition two old village sites are nearby at Cape Lookout which were used seasonally as a base for sea otter hunting. Several burial caves are also located in this general area (Bob's Bay, Diver Island, Gold Harbor, and Sakai Point). The timing of the sockeye run is mid-July to the first week of August, unless the sockeye run is delayed by drought conditions. During the Sealaska Historic Site investigation conducted in 1975, interviews were conducted with Delbert Nix, Ed Sanderson, and George Hamilton Sr. by myself concerning this site. I later interviewed Harris Natkong Sr., Ed Hamilton and William Wallace Sr. on the Haida Historical sites, especially the outer coast of Dall Island, Hetta Lake and Forrester Island. These interviews are the basis of the information provided here."

This sockeye system probably contributed a small amount of sockeye to the commercial fishery, several hundred to a thousand."

Historical Impacts: Interceptions of salmon by purse seiners operating in the month of July on the outer coast of Dall Island may have occurred. Harris Natkong Sr., Gideon Duncan Sr., Harold Dilts, Loren Sanderson and Harris Natkong Jr. commercially harvested sockeye in Welcome Cove at various times, sporadically from the 1940s to the 1980s. Loren Sanderson reported once taking 800 sockeyes from Welcome Cove in the mid-1980s. R. Sanderson reports that to his knowledge, no one has harvested sockeye from Welcome Cove in recent years.

Recent subsistence use: No known subsistence use in the lifetimes of elder/experts nor reported by any others.

Field observations: Welcome Cove was visited on foot in July 2007 and by aerial flyover on September 13, 2007. Field observation of the system took place on July 14, 2007. We did not see any sockeye at the time. Tony Christianson walked up the outlet stream to the lake and found no blockages or beaver dames. One sockeye jumped at the entrance to the cove as we finished our interviews and departed Welcome Cove. During the aerial flyover, no blockages were identified in either the outlet or tributary streams. No fish were observed. The lake was too small to land and take off again.

Figure 74 Welcome Cove showing outlet stream and lake. The primary sockeye tributary enters at the southeast head of the lake.

Figure 75 Welcome Cove lake with tidal outlet stream in the upper left area.

Figure 76 Welcome Cove outlet stream looking toward salt water.

Port Bazan ***Haida: unknown***
Port Bazan is the largest embayment on the southwest coast of Dall Island with an island separating a north and south entrance.

ADF&G District and Number: 104-20-65 Lat W 54° 51' 00" W 132° 55' 15'
Area: The stream on the northeast side of Port Bazan is considered a possible sockeye system.

Biological data: Only one published observation of this system is available (Novak 1975b:87). The stream forks into two branches about 200 yards among mean high water. The stream was not considered to be able to support sockeye despite have a lake at the headwaters due to barrier falls about 50 yards above mean high tide in the left fork and a massive log jam on the other. Only 62 meters squared of spawning area were estimated due to the bedrock nature of the streambed.

Precontact salmon harvesting technology: No evidence of precontact harvest technologies were observed or have been reported.

Historical records of commercial harvests: There are no recorded commercial harvests of sockeye salmon for this system.

TEK: No specific TEK on this system was provided in the elder/expert interviews or documentary records. R. Sanderson's characterization: "During an interview with my brother, Loren Sanderson he stated that they saw small amounts of sockeye when they were hunting deer near this inlet creek at the head of Port Bazan." No other information on the system was provide by elder/experts.

Historical Impacts: Interceptions of salmon by purse seiners operating in July on the outer coast of Dall Island may have occurred. Locations in proximity to Port Bazan are consistently utilized. There has been extensive logging of uplands surrounding Port Bazan at various times in the last 50 years. It is unknown if this logging has had any impact on the salmon streams (see Figure 77).

Recent subsistence use: No reports of subsistence use of this system have ever been given.

Field observations: Field investigation of Port Bazan occurred in July 2007 and aerial observation in September 2007. A short visit was made to the stream on July 20 when no sockeye were observed in the bay, estuary or the short sections of the two tributaries which Tony Christianson examined. He found the left fork rocky and narrow with a barrier falls about 50 yards above high tide. The right arm appeared to have much blow down. During the plane trip in September no sockeye were observed; however, a few pink and chum salmon were seen.

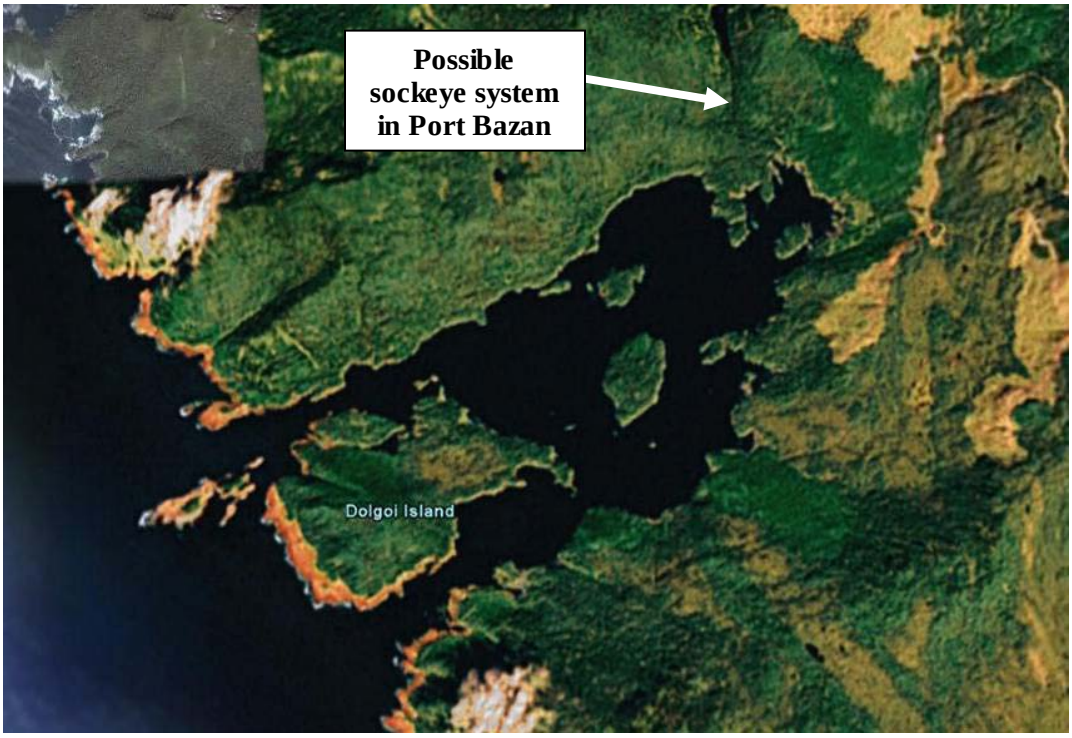


Figure 77 Port Bazan showing location logged areas and possible sockeye salmon stream.

Figure 78 West fork of outlet stream of possible sockeye system in Port Bazan

Figure 79 East fork of outlet stream of possible sockeye system in Port Bazan

Essowah Lake ***Haida: Iisuwaa***
The term Essowah Lake references a complex system of tidally influenced outlets and multiple interconnected freshwater lakes each with one or more tributaries.

ADFG District and Numbers: 104-10-08 (Essowah Lake Creek), 104-10-10 (Parrot Creek), 104-10-15 (Bar Creek), 104-10-20 (Lily Pad Lake Creek)
Area: Several tributary streams into the Essowah Lake system on the southwest end of Dall Island are considered sockeye spawning streams.

Distance from Hydaburg: Essowah Harbor is located approximately 40 miles southeast of Hydaburg on the southwest coast of Dall Island.

Biological data: The streams are collectively considered a medium production system with an estimated spawning area of 4871 meters squared. The only known field observation of the system occurred on August 11, 1975 when no sockeye were observed in the systems but salmon bones were observed in Parrot Creek (Novak 1975b: 7-22).

Precontact salmon harvesting technology: No evidence of precontact harvest technologies have been reported for Essowah Lake.

Historical records of commercial harvest: Moser (1899: 69) reports that 3600 sockeye were harvested from the system in 1896 and a total of 812 mixed fish taken from this system and another termed Dall Harbor in 1897. No other records of commercial harvest amounts are known since that time.

TEK: At the Hanna hearings in 1944, Frank Nix made the following observation:

> "When I was a boy they had a hunting ground in the mouth of Sea Otter Bay. And then further down there is a sockeye creek – further down towards Cape Muzon. That was also occupied by a Haida man" (USDOI 1944).

Mr. Nix made the following more direct reference as well: "There is a sockeye creek there at Essowah Point and there is a Salt Lake where fishing was observed" (USDOI 1944). Claude Morrison (2007) reported catching sockeyes in the small cove immediately to the east of Essowah Point. The fish were relatively dark at the time of capture. They could have been taken from either the Essowah Lakes or Essowah Point system. Robert Sanderson reported that at least three Hydaburg purse seine vessels had reported catching dark sockeyes inside of Essowah Point. Cliff Douville, who fished with Haida captain Frank Lauth of Craig in the area in the early 1960s, reported that sockeyes caught at the mouth of Essowah were exceptionally large fish. Harris Natkong Jr (2007) stated that he had gone up into the lake in the 1950s on a power skiff with his father. On that trip they had observed sockeyes in the vicinity of the tributary stream on the north side of Essowah Lake, the first lake.

R. Sanderson characterization: "Essowah Lakes system is the largest drainage on Dall Island, consisting of two large lakes, and various tributary streams, that empty into Essowah Harbor. These lakes supported a subsistence fishery in the past, with a camp in Essowah Harbor. A description of the Essowah camp, with the historic use of the area,

was provided by Robert Cogo. Just before the lower lake, a fish camp and summer village was located to harvest sockeye salmon bound for Essowah Lake. This area was utilized by the Haida as a sockeye subsistence fishery, from Kaigani village located near Cape Muzon and probably from Howkan and Koinglas. In addition there were other camp sites in the vicinity of Essowah. There were several informants on this area at the time I was involved in the Sealaska Historic site survey, George Hamilton Sr., Delbert Nix and Ed Sanderson. A very old village site was identified inside of Ritter Point to the north; we have no name for the site, and neither do the Tlingit people. This site was reported to Robert Sanderson by Delbert Nix, Ed Sanderson and George Hamilton Sr for the Haida Historic Sites project.

The lake can be accessed by air, or through Essowah Harbor, by boat. Boat access is possible during good weather. Bad weather, heavy seas and ground swell would limit access to Essowah Lakes by boat. The sockeye run to the lake peaks in the month of July. I have observed sockeye in the first week of August in the bay. These fish were very dark and red - possibly held up by low conditions to the small lake at the inlet of Essowah Harbor. The large stream draining Essowah Lakes probably does not have low water conditions that would delay the sockeye run."

Historical impacts: Moser (1899:78) reported that: “At Wrangell a gentleman connected with the customs service reported that a stream on Dall Island was tightly barricaded.” In that sockeyes were the primary species sought by canneries at that time, it is possible that Essowah was barricaded to maximize harvests for cannery production. Interceptions of salmon by purse seiners operating in the month of July on the outer coast of Dall Island may have occurred as noted by R. Sanderson above. There has been a limited amount of logging activity in the area which occurred during the 1950s and 1960s. It is unknown if this logging activity had any impact on sockeye productivity.

Recent subsistence use: No known subsistence harvests are reported by R. Sanderson or elder/experts interviewed in the last fifty years.

Field observations: Field observations were made by vessel in July 2007 and by air in September 2007. We traveled to the Essowah Lake outlet. We arrived there at low tide. At the head of Essowah Harbor, a large saltwater falls was observed from the boat. At high tide the upper harbor can be accessed and from there to Essowah Lakes. The lower lake is just above sea level at high tide. Possibly at extreme high tides one can enter the lake. Due to the strong outflow and the steep bedrock outcropping, we were not able to travel into the Essowah Lakes system. A salmon jump, thought to be sockeye, was observed in the lower portion of the tidal outflow of Essowah Lakes. During the aerial flyover on September 13, 2007, several jumps were observed on the northshore of the inner lake.

Figure 80 Essowah Lakes system outlet stream

Figure 81 High velocity outflow from Essowah Lakes system

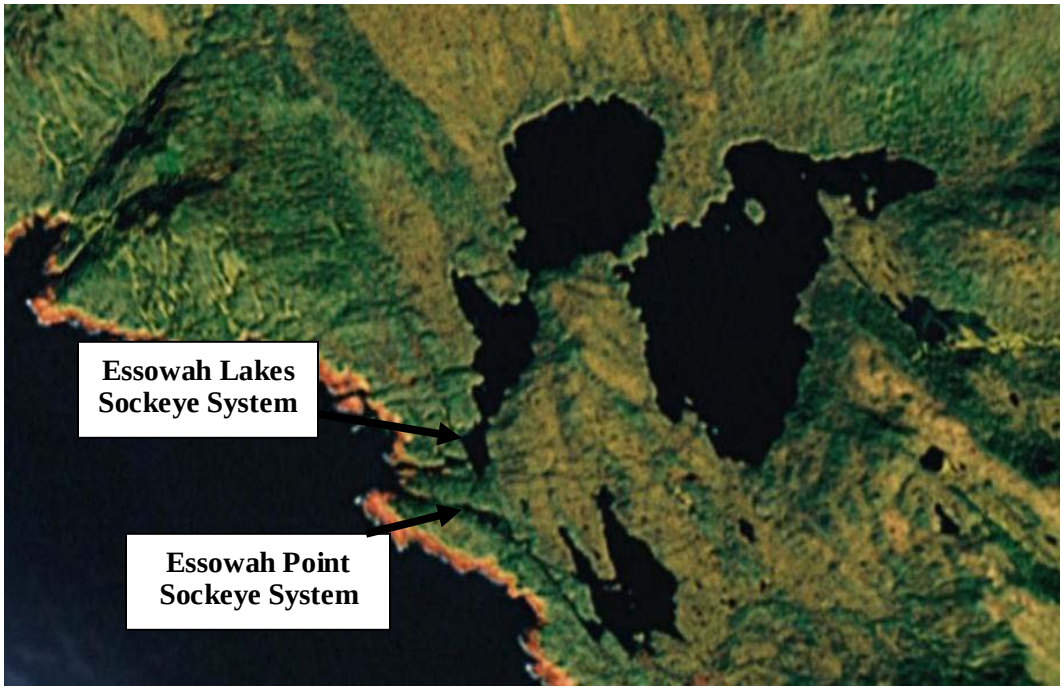


Figure 82 Essowah Lakes and Essowah Point sockeyes systems which empty into Essowah Harbor on the southwest coast of Dall Island.

Essowah Point Creek ***Haida: unknown***
Located on southwest coast of Dall Island, immediately east of Essowah Point.

ADFG District and Number: 104-10-25 Lat N 54° 46' 20" Long W 132° 53' 52"
Area: The outlet stream at Essowah Point enters salt water at the head of a small cove immediately east of Essowah Point. The estuary of the stream is steep and the streambed consists of bedrock and large boulders.

Distance from Hydaburg: Essowah Harbor is located approximately 40 miles southeast of Hydaburg on the southwest coast of Dall Island.

Biological data: The stream is considered a small but "excellent sockeye producer, based on the available rearing area of the lake and potential spawning areas at the head stream and along the lake shoreline" (Novak 1975b:27). The estimated spawning area for the system is 70 square meters. There are no observations of sockeye reported and no estimates of escapement.

Precontact salmon harvesting technology: No evidence of precontact salmon harvest technologies have been reported and none were observed.

Historical records of commercial harvest: There are no reported harvests from this system however Moser's reports of commercial harvests in 1897 and 1898 from Essowah and Dall Harbor may include sockeyes taken from the Essowah Point stream.

TEK: No specific information beyond that identified in R. Sanderson's characterization of the system were provided in the expert/elder interviews. R. Sanderson's characterization: "A small stream from the south drains into Essowah Harbor also known as Essowah Point creek. This stream according to Ed Sanderson supported a small run of sockeye. Information on this system was provided to Robert Sanderson by George Hamilton Sr., Ed Sanderson, and Delbert Nix."

Historical impacts: The barricade stream on Dall Island reported by Moser (1899) may have been this system. Interceptions of salmon by purse seiners operating in the month of July near Essowah Point may have occurred as noted by R. Sanderson above. There are no other reported or known historic impacts.

Recent subsistence use: No subsistence use has been reported in the lives of the elder/experts.

Field observations: Field observations on foot were conducted in July 2007 and aerial observations in September 2007. On July 18 we identified the small stream which enters just inside Essowah Point which drains a lake possibly a mile above the outlet. Because of the uncommonly good weather we were able to land. Tony Christianson and Marita Tolson walked the stream to the lake, a fair sized shallow lake, with a beaver dam at the outlet (see Figure 85). He and his field assistant opened the dam. No sockeye were

observed in the stream during the field investigation. No sockeye were observed during the aerial flyover of the system on September 13, 2007.

Figure 83 Entrance to Essowah Point Creek looking south from Essowah Harbor. Robert Sanderson (L) and Tony Christianson

Figure 84 Intertidal estuary of Essowah Point Creek composed of bedrock and boulders

Figure 85 Beaver dam located in Essowah Point stream near outlet from the Lake

VI. DISCUSSION

This chapter will highlight key findings of the research on the customary and traditional sockeye salmon systems utilized by the K'iis Xaadas and identify key issues from the research related to the current subsistence utilization of sockeye salmon by K'iis Xaadas of Hydaburg.

Findings

At the time of European contact and into the mid-19th century, the K'iis Xaadas population of 1500-2000 people occupied and utilized the lands and waters of the southwestern quadrant of the Prince of Wales Archipelago including all of Dall Island and Forrester Island. People dispersed annually from five winter villages in the spring to camps and then moved in June and July to salmon streams to harvest and process salmon for winter use. Sockeye salmon were first used in June and July and then families moved out to many other streams to take pink, coho and chum salmon as well. In testimony before the Hanna hearings in 1944, Powell Charles stated:

> "They fished in every stream. Every stream was occupied" (USDOI 1944).

Territories and streams were under the ownership of lineage and house leaders who controlled access and use of the streams. They were also trustees responsible for insuring the continuing productivity of the systems they controlled. Members of lineages and houses utilized the streams in their territories or obtained authorization from lineage and house leaders to use other streams. Traditional ecological knowledge presented at the Hanna hearings in 1944 identified the customary and traditional owners of territories, and in particular sockeye streams, in the late 19th century. These ownership rights were recognized by the early Euroamerican commercial salmon industry developers (see Appendix B).

In the last two decades of the 19th century, commercial salmon production began based on the primary sockeye salmon systems of this area. Substantial sockeye harvests were made for commercial uses during the first 15 years of operation. Harvests exceeding 100,000 sockeye salmon from Hetta alone were realized over two full cycles of sockeye return. However, Bureau of Fisheries official Jefferson Moser who visited the area in 1897 found evidence of recent or current impenetrable barricades at the mouth of every sockeye salmon stream in K'iis Xaadas territory on Prince of Wales Island. These blockages led to dramatic reductions in if not elimination of sockeye runs to virtually all the systems. K'iis Xaadas leaders informed Moser of their objections to these practices and their concerns over the decimation to the salmon stocks that were the result (Moser 1899).

The K'iis Xaadas population was reduced by 80% due to diseases in the late 19th century. In 1912 the remaining population relocated from three villages to a new site known as Hydaburg. This movement also coincided with a cessation of stream ownership and enforcement by traditional lineage and house leaders. Limited use was made of sockeye salmon for subsistence in the 1920s as harvests focused on pink, cohos and chums in streams near Hydaburg.

In the 1920s, floating fish traps and purse seine fishing vessels moved salmon harvests away from the streams. K'iis Xaadas fishermen adopted the new vessels and methods and began making commercial harvests of salmon along the outer coast of Dall Island by the mid-1920s. Some use was made of sockeye salmon for commercial purposes but no subsistence use was made of Dall Island sockeyes. The new vessels allowed for occasional and periodic visitation to the customary and traditional streams to see if there were fish to be caught for commercial sale. Those visits provided the opportunity for sustaining certain elements of traditional ecological knowledge about the systems. However, the practices of local residence and presence over several weeks characteristic of the 19th century did not occur and so stream specific traditional ecological knowledge and trusteeship principles were not practiced during the period of salmon return after the adoption of purse seine vessels in the 1920s.

Traditional ecological knowledge concerning the location and timing of sockeye runs throughout the K'iis Xaadas territory has been handed down orally by ancestors who were adults in the late 19th century to elder/experts of the current period. Robert Sanderson provided much of that information for this research which guided the field observation phase of the research. Traditional ecological knowledge captures a wide range of oral traditions, experience and observational data that identifies the location, run timing and other characteristics of the 16 sockeye systems. Robert Sanderson represents an unusual, perhaps even unique individual, whose strong interest in the health of salmon and its continued subsistence use by Hydaburg have led him to integrate traditional ecological knowledge with other knowledge acquired from the biological literature and from fishery biologists and managers. Noteworthy are his contributions to understanding the Hetta system including its three run pattern and lake spawning and his identification of the impacts of beaver dams on sockeye salmon production. These represent distinctive contributions of a local expert informed by traditional ecological knowledge.

Traditional ecological knowledge is particularly well-developed for the systems closest to Hydaburg that have been the primary source of sockeye salmon for the past 70 or more years, namely Hetta and Eek. Use of those systems is communal. Beach seines are used which vary in mesh size. Harvests of sockeye from Hetta usually begin in the last two weeks of June and continue throughout the month of July and perhaps early August. Harvests from Eek are concentrated in July and rarely earlier or later.

Several of the systems recognized as sockeye producers and recently used for sockeye harvests by the K'iis Xaadas are either not identified as salmon systems (Coffee Chuck) or not identified as sockeye salmon producers (Manhattan Arm, Welcome Cove, Hessa) in federal and state biological literature on the streams of this area. Especially lacking is knowledge about the sockeye systems of Dall Island.

Field observations of traditional K'iis Haida sockeye systems demonstrated that there were sockeyes in or in the near vicinity of all 16 streams with the exception of Kasook, Welcome Cove, Coffee Chuck, and Keete. Kasook and Coffee Chuck have provided sockeye subsistence in the past decade but not within the past five years. The field observations provided important orienting information and some very limited amount of

data on the status of stocks that are not customarily visited and about which there was no published biological information. One time observations are not sufficient to provide the level of information necessary for tribal planning and management to incorporate outlying and underutilized sockeye stocks in Hydaburg subsistence practice.

Recent returns to Hetta and Eek, the primary systems used for subsistence sockeye have fluctuated widely in recent years from runs approaching historically known highs to the poorest returns observed in the lifetimes of living elder/experts. These circumstances are of concern and require continued close monitoring of annual returns to those systems, particularly Hetta.

Changes in the timing of returns have been identified. There appear to be somewhat later returns now than in the second half of the 20th century. For example, in the Hetta system the third run, the largest segment, historically peaked around August 20. But in 2007 the run was approximately 10 days later in appearing in abundance. In 2008, the run returned to a more historic pattern with peak returns occurring in the third week in August. In 2006, returns to all the streams were later than expected based on historical data by several days.

Beavers have been identified as a significant factor in sockeye presence and abundance. This is based on information provided in Hanna hearings testimony, by elder/experts in their interviews and by field observation. Tlingit elder/experts have also identified beavers, through their damming activities, as harmful to sockeye salmon production (Langdon 2006). As Figure 81 demonstrates, Jefferson Moser's crew encountered at least one beaver dam during their visit to southeast Alaska in 1897 but this one was found on Kuiu Island, not Prince of Wales Island. It should be noted that Moser and his crew, as the picture demonstrated, opened the beaver dam by removing a section in the center. In fact, none of Moser's sketch maps of stream drainages surveyed in K'iis Xaadas territory depict the presence of a beaver dam (Moser 1899). This fact intriguingly poses the possibility, even likelihood, the K'iis Xaadas were removing beaver dams on sockeye streams in the precontact period and into the second half of the 19th century. In federal and state stream catalogues, beaver dams are occasionally commented upon and do appear in several sketch maps in Edgington et al. (1981). However, only on one occasion was a beaver dam reported to have been removed by federal or state fishery biologists. Beaver dams are of significance in halting sockeye salmon movement and ability to reach spawning in lakes or tributary streams. The field surveys located or demonstrated their presence in Kasook, Essowah Point, and recently in Eek. During the aerial survey beaver dams were also identified in Manhattan Arm, Keete, Biscuit Lagoon, and possibly Hessa (on one of two lake tributaries). Nichols Bay and Hunter's Bay were indeterminate due to canopy coverage and dark waters. Beaver environmental impacts beyond stream blockage include raising water levels, slowing stream flow, probably lowering stream level and increasing stream temperature. These factors taken collectively are detrimental to sockeye reproduction.

The recent case of tribal management of the Eek system is taken as illustrative of the importance of monitoring and proactive steps taken in regard to beaver presence.

Declining returns lead to stream examination which revealed that beaver dam presence between high water and the entrance to the lower lake was keeping sockeye and pink salmon from moving upstream. The returning sockeyes remained in the bay where they continued to be harvested. This led to likely overharvesting. When the beaver dam was removed, water temperatures dropped and the fish moved up quickly. The beavers rebuilt the dam by the next season, so it was completely removed in 2004. Had the beaver dam been in place since 2002, the low returns experienced in recent years could well be attributable to the dams presence for several previous years.

Figure 86 Jefferson Moser and his Bureau of Fisheries crew removing a beaver dam on Kuiu Island in 1897. Moser is in the white shirt.

Issues

The findings presented above in conjunction with the contemporary utilization of sockeye salmon for subsistence pose several significant issues for tribal leaders and fishery managers. These issues pertain to two central questions:

1) What actions should be taken to insure the sustainability of sockeye salmon stocks in the K'iis Xaadas tribal territory?
2) What actions are needed to insure sustainable use for subsistence by the K'iis Xaadas of the sockeye salmon stocks of their area?

In addition, other important issues that should be addressed include:
What is the level of escapement that should be considered appropriate for the Hetta system? How can improvement in the escapement and productivity of the June run be accomplished?

How can tribal management improve the distribution of subsistence effort at Hetta by shifting harvests to July and August?

How can tribal management facilitate Hydaburg residents harvests from presently underutilized sockeye systems? How can additional research and monitoring be done on larger sockeye systems that are unknown and are underutilized, namely Klakas, Hunter's Bay, Nichols Bay and Essowah Lakes?

Can tribal managers be delegated the authority to open and close subsistence sockeye fishing on customary and traditional streams if escapement levels are too low?

What resources are needed to engage in systematic monitoring for presence of sockeye salmon and dangers to sockeye salmon production from beaver dams? Can high quality satellite photography identify beavers dams on sockeye systems?

VII. CONCLUSION AND RECOMMENDATIONS

The conclusion will provide a summary assessment of the extent to which the objectives for this research project have been met and a set of recommendations follow which are related to the key issues which both motivated the research and continue to be central to the thinking of tribal leaders of the Hydaburg Cooperative Association.

Research objectives

Traditional ecological knowledge interviews with six K'iis Xaadas elder/experts produced a substantial body of information on the 16 sockeye systems of the region. In addition, the place-based, on-site TEK interviews with Robert Sanderson at 14 of the 16 streams provides an irreplaceable record of his observations and knowledge about those systems. The information acquired ranges widely over issues and addresses both general and stream specific aspects of the knowledge. The traditional ecological knowledge was based on oral traditions from ancestors and from personal experience and observations. Much of that information is summarized by topic in this report in Chapter V. The original transcripts from the interviews will be available from the Hydaburg Cooperative Association and from Dr. Steve J. Langdon of the University of Alaska Anchorage. This corpus is of enormous significance to the cultural heritage and sockeye subsistence use of future generations of K'iis Xaadas.

A substantial body of documentary material was accessed and reviewed for information relevant to the use and characteristics of the sockeye systems customarily and traditionally utilized by the K'iis Xaadas for subsistence. Historic fisheries records from the 19th century visits of Bureau of Fisheries personnel provide a surprisingly good baseline on the productivity of the sockeye systems in the area as well as on the early commercial harvesting practices and how those affected the stocks. Haida elders witness testimony at the Hanna hearings on aboriginal title in 1944 provide important information on pre-commercial ecological conditions as well as cultural practices related to the use of salmon resources. In addition, witness testimony also addresses the impacts of commercial floating fish traps on salmon behavior and the elimination of certain stocks during the historical period of their use, circa 1920 to 1959. Ethnographic writings and writings of K'iis Xaadas observers and recorders provide additional information on traditional territory and harvesting practices. Stream catalogues produced by federal and state fishery biologists provided some observations on the status of sockeye stocks and the nature of stream habitats for certain streams over the period 1929-1979. The utility of the documents for evaluating the history of sockeye abundance is low due to the fact that most of the recorded observations occurred in late August and September as they were directed toward pink salmon abundance, the predominant commercial species. Information from these various sources regarded as significant for this study have been incorporated into Chapter IV and V.

Field observations were conducted via vessel and foot and by air and foot. In 2007, all the streams were visited by vessel with the exception of Coffee Chuck, Biscuit Lagoon and Nutkwa. Aerial over flight of the entire region was conducted in September 2007 and landings occurred on Devil's Lake and Klakas to confirm sockeye salmon presence

in lake tributary streams. Vessel visitations to Eek, Hetta, Kasook, Klakas and Hunter's Bay were also conducted in 2008. The 2008 field visits occurred three weeks later than in 2007 and more observations of salmon in estuaries and streams were made. Observations and photos from these visits are incorporated on a stream specific basis in Chapter IV and V.

The database called for in the research objectives has been established but the data presented in this report have yet to be entered into it. This would be a useful tool to both summarize past data and maintain ongoing observations of the status and conditions of all the stocks from monitoring and reports.

The process of acquiring the data presented in the report has already been of major educational significance to HCA tribal researchers and leaders. The report when final will be broadly disseminated within the community and made available to the school. Transcripts from the interviews and a DVD of Robert Sanderson's on-site TEK interviews at the streams would be a major educational resource for cultural heritage and history curricula in the Hydaburg School District.

Recommendations

The recommendations that follow were developed through discussion among the HCA researchers (Christianson, Duncan and Sanderson) and Langdon.

Tribal planning

The issues addressed above require the development of an integrated tribal management plan. Such planning is not possible given the present resources of the tribe and additional resources are needed to accomplish such a plan. Such a plan would address a wide variety of issues including establishing ordinances for tribal authority concerning subsistence salmon seasons and establishing a tribal quota to supply sockeyes and other salmon to tribal elders or others unable to harvest and process their own. Appendix C contains preliminary thoughts for tribal management of Hetta and Eek sockeye systems.

Staffing

Additional staff are required on an ongoing basis for the development of the plan and the acquisition and dissemination of information. Resources for such a position, which could be expanded more broadly to a Natural Resources portfolio are not available. A tribal sockeye salmon management plan can only be developed with expertise and resources which are presently unavailable.

Monitoring

With or without a tribal management plan, there is a clear need for additional funds and resources to be available to 1) monitor major streams for the timing of returns and levels of abundance and 2) monitor streams for beaver dams. The weir system at Hetta has been a major factor in providing information about that resource crucial to ensuring future productivity from the system. At a minimum, a dedicated skiff-outboard combination and adequate fuel plus funds for aerial flights in September should be

acquired to make such monitoring possible. Pro-active treatment of beaver presence will go along way toward protecting sockeye salmon stocks and productivity.

Regulatory changes

At the present time, commercial fishing openings in mid-August in the inside waters in the vicinity of Eek and Hetta pose a danger to escapement levels. The tribe has developed specific regulatory proposals to close those waters to commercial fishing when such harvests might endanger runs to either of those two systems. Several regulatory changes for the commercial purse seine salmon fishery are included in the draft plan presented in Appendix C.

Research

Basic research on abundance and run timing needs to be done for a full cycle on larger systems that could potentially provide additional sockeye salmon for subsistence. Research needs beyond monitoring described above is needed to address issues about sockeye salmon rehabilitation and promotion. For example, the falls at Klakas and Eek are difficult hurdles for salmon to leap over. Sometimes sockeyes are forced to school up and wait for large tides to be able to ascend to their spawning grounds. As a result, they are vulnerable to both die off and over harvest. Research should be done to identify if fish ladders might make it possible for sockeyes to move up on every tide rather than wait for the large tides. Research might also be done to determine if smaller systems such as Kasook and Coffee Chuck could be rejuvenated by stock transfers from other sockeye systems.

Dissemination and education

The information compiled in this report, in the transcripts and in the digital video tapes should be broadly disseminated among the K'iis Xaadas tribal membership in Hydaburg, Alaska. Such dissemination and accompanying discussion will help the community as a whole move toward practices that will assist in sustaining the sockeye salmon resources and subsistence uses of them. Likewise, incorporation of these materials into the Hydaburg School District curriculum will inform and educate future K'iis Xaadas about their heritage, their trust responsibility to the sockeye and other salmon and help them envision a productive, meaningful and fulfilling future.

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APPENDIX A:

K'iis Xaadas Salmon Traditional Knowledge Interview Guide

"The purpose of our interview today is to learn from your life experiences and training about the use of salmon by Klawock Tlingit people. If there are additional things you would like to tell us about salmon beyond what we specifically ask, please do so. The information will be made available to the Hydaburg Cooperative Association and the Hydaburg School District to assist in the continuance of K'iis Haida cultural heritage and in the management of salmon in our tribal interest. The research is funded by the US Department of Fish and Wildlife, Office of Subsistence Management. They are the federal agency responsible for insuring subsistence rights in Alaska."

A. DEMOGRAPHIC INFORMATION

Name (English)_____ Name (Haida – if known)_____

Maiden name_____ Clan _____ Village_____

Clan house crest_____ Tradition house location_____

Date of birth_____ Location of birth_____

Number of years in Hydaburg_____ Other locations_____

Father's clan_____ Grandfather's clan_____

B. SALMON USE

1. Please tell us about your use of salmon that you can remember from childhood.
2. Please tell us what you learned about salmon from your parents, their brothers and sisters and other elders?

   What kinds of salmon did you with your family obtain?
   What do you remember as the first thing you learned about salmon?

3. From which streams and or locations did your family obtain salmon?
4. Did your family obtain and use sockeye salmon – if so,

   From what locations? How did they decide where to get the fish from?

   Using what technology?

   In what group (who else was there)?

   Who did what at the location – deciding when to fish, catching, processing?

   What number of fish did your family or group attempt to harvest?

5. Were any specific procedures required at the start of the fishing or during the processing? For example, welcoming the salmon, thanking the salmon, other.
[Ask similar series of questions for dog, pink, and silvers]

6. Summer salmon camps
Did your family go away from Hydaburg to a salmon camp in the summer?
Where was it or if more than one, they located?
Were there different ones for different times of the year?
Personnel – who was at the camp – people?
How long would you be at the various camps?

C. CHANGES IN SALMON SUBSISTENCE USE

How did you and your family's use of salmon change through your younger life?

When you were a teenager, before you got married, were there changes in your use of salmon like where you went, what species, what amounts? Please discuss.

After you got married, were there changes in your patterns/practices of salmon use?

D. SALMON CHARACTERISTICS

What differences are there between the different types of salmon you use?
Size, sex, coloration, form (length to girth), other differences

In what ways do healthy and unhealthy look different – external appearance, internal appearance (when opened)?

What factors affect the time of arrival of salmon? (temperature, wind, rain, winter)

What factors affect how they arrive (fast, slow, all at once, little bit)?

What are the names for the parts (internal, external) of salmon?

What is the "slime" covering called? Does it have any special significance?

E. SALMON BEHAVIOR

Please tell us what your learned about salmon behavior from traditional stories your elders told. [Origin, where they live, how they feel, how they return to this area, etc.]

Where do salmon come from?

How do they know where to go?

What do they do when they come to the bay?

Are there any differences between male and female salmon in their behavior– if so, what are they?

Are there size differences between various streams or locations?

Are there other differences such as coloration or form between salmon from different places?

Are there any reasons you know of for differences in size, coloration or form?

What affects number of salmon that come in any year? and their time of arrival?

Do different salmon species have distinctive behaviors? (jumping, diving, speed, etc.)

Are there different runs or groups of salmon returning at different times? Is so, in what streams and in what pattern or manner?

F. HUMAN BEHAVIOR AND SALMON

When salmon arrive in Hydaburg Creek or nearby streams, are there any ceremonies or special actions taken to greet them?

In what way do human actions affect salmon?

How should humans handle salmon they have caught?

How they are caught, handled, spoken of, cut and processed?

Indirectly, do human behaviors elsewhere such as speech, distribution, waste, etc. effect the relationship between humans and salmon?

The concept of taboo is a concept of what people should not do. Are there examples of this concept in regard to salmon – what shouldn't people do?

Were there specific songs, dances, blankets, or other regalia for salmon or for salmon from certain rivers/streams?

G. RESPECT

Were you taught about "respecting" salmon? If so, can you give examples?

Were there any special provisions made for bears, seals, sea lions or other animals that used salmon?

H. FUTURE USE

Is it important for the K'iis Xaadas people to continue their relationship with salmon and if so, why?

What are the most important things to pass on and teach young people about salmon and their relationship with people?

EXPERT ADDENDUM – for individuals with special knowledge, training and/or responsibility. This may be determined prior to or during the interview.

Salmon Migratory Routes

Are/ were people aware of the paths salmon take from the ocean to various streams in the K'iis Xaadas territory?

Do different species of salmon use different routes to return to their spawning streams? Can you describe the routes on this map?

Do sockeye salmon returning to one stream use a different route to return to their natal streams than sockeye going to a different stream? Can you describe the routes on this map? (Repeat for other salmon species.)

Are there differences in how male and female salmon return to a stream? In the ocean? In the estuary?

Stock Separation

What characteristics (size, color, shape, behavior) were used to distinguish between sockeye populations from different streams? (pink, chinook, chum, coho...)?

When different types of salmon used the same river, how did they distribute themselves in the different areas?

Monitoring of Run Abundance

How did clan leaders and others judge how many salmon were returning to a particular stream?

Were clan leaders able to predict how many salmon would return to a particular stream before the salmon arrived? What observations did they use? Did they keep track of observations from the year when their parents spawned (weather, amount of rain, behavior, abundance of salmon, other signs from nature...)?

How did they judge when there were enough salmon in the stream to support a harvest?

Did watching salmon jumps provide any useful information about how many salmon were returning to a particular stream?

Monitoring/Controlling the Subsistence Harvest

Did leaders keep track of how many salmon were being harvested from a particular stream?

How did leaders decide when to allow people to begin to take salmon from a particular stream?

Were there special rules or rituals for the first salmon to arrive?

How did leaders decide if there were too few salmon to support a harvest?

Were clans concerned about too many salmon trying to spawn a particular creek in the same year? If so, how did they determine that there were too many salmon and what did they do?

What was the role of elders in managing the fisheries? What influence do the elders have today in the contemporary fishery?

Strategies during time of low abundance

What did clans do when too few salmon returned to a particular stream?

Selective Harvest:

Did people ever select certain individual salmon to harvest because there were too few fish returning to a particular stream?

Did clans ever avoid taking female salmon or limit their harvest to males only?

Did clans ever limit their harvest to salmon that had already spawned?

Enhancement:

Were there any methods used to try and increase the number of salmon returning to a stream?

Did clans ever move salmon or salmon eggs from one steam to another?

Harvest Restrictions

Did leaders ever limit the number of salmon that could be taken from a stream by members of their own clan?

Did leaders ever stop people from fishing on a stream because too few salmon had returned?

Did leaders ever restrict their harvest to certain times of the tide, day or year?

Other related questions

Are there sockeye streams in the Hydaburg area without a lake? Where do the young sockeye rear in these systems?

Are there any stories about the use stone or wood traps in the estuaries?

APPENDIX B:

Alaska Territorial Registration of Moses Kolkeet Lease of Hetta, 1894

REPRODUCED AT THE NATIONAL ARCHIVES

This indenture made this 23rd day of June 1894, by and between Moses C. Quicket [Twicket ?], a Hydah of Hetah, [?] Prince of Wales Island and the North Pacific Trading and Packing Co. of Klawock, Alaska,

Witnesseth:- That the said Moses in consideration of the covenants of the said North Pacific Trading and Packing Co. hereinafter set forth, does by these presents Lease unto the said North Pacific Trading and Packing Co. Hetah Creek, situated on Cordova Bay, Prince of Wales Island, of which creek, I the said Moses claim to be the sole owner, agreeing also to keep all parties or persons from interfering with the said North Pacific Trading and Packing Co., in the execution of this lease

To have and to hold to the said North Pacific Trading and Packing Co. from the 1st day of April 1897 to and for the term of Ten (10) years from the said 1st day of April 1897.

And the said North Pacific Trading and Packing Co., in consideration of the leasing of the creek as set forth above, agree with the said Moses to pay as rent for the same, the sum of Fifty ($50.00) dollars per annum, payable at and by the sum of Five ($5.00) dollars at date of this indenture and forty-five ($45.00) dollars to be paid the 1st day of April 1897, when this lease takes effect. The after payments for rent to be made on the 1st day of April at the aforesaid rate of Fifty ($50.00) dollars per annum, each succeeding year until expiration of this lease.

The covenants herein contained shall extend to and be binding on the heirs, executors and administrators of the parties to this lease.

In witness whereof we have hereunto set out hands and seal at Klawock, Alaska, this 23rd day of June 1894.

Witness,

Harry F.Swift

Moses

His X mark (seal)

A.S.Wadleigh, Supt. (seal)

Recorded at 2 o'clock P.M. September 12th, 1894

Wm.A.Kelly

Recorder.

Recording fee $1.50. paid

APPENDIX C:

DRAFT
Management Plan for Sockeye Production and Subsistence Use in Hetta and Eek

Hydaburg Cooperative Association staff will examine weir and harvest records to determine the relative expected strength of sockeye returns to Hetta and Eek for the upcoming year in the spring prior to harvest.

Hydaburg Cooperative Association will conduct an inventory of community households in April to determine likely participation, locations and possible harvest goals.

Hydaburg Cooperative Association aims to maximize sockeye escapement and utilization by attending to the distinct runs, their timings and local harvest conditions of the primary sockeye systems.

Hydaburg Cooperative Association proposes increased closed area to purse seining to maximize subsistence use and escapement of Hetta sockeyes. Due to the overlapping presence of sockeye and pink stocks during the first two weeks of August, altering closed areas will provide additional protection. During this period, there will closed waters from Copper City to Point Simmons constituting areas adjacent to Hetta Harbor providing for late season Hetta sockeye escapement while allowing harvest of surplus. These waters should not be opened to commercial purse seine fishing at any time.

Traditional knowledge indicates that Eek sockeye stocks are often intercepted by purse seine harvests during the first two weeks of August in the vicinity of Eek. This practice can limit the subsistence harvest and endanger the escapement. Therefore additional protection is needed for the Eek stock and the closure line should run from Round Point to Copper City on the north side of Hetta Inlet from the middle of the channel to the shore.

On the east side of Hetta Inlet, waters from Copper City to Simmons Point, from the middle of Hetta Inlet to the south shore should be closed to commercial fishing to maximize subsistence and escapement. These waters should not be opened to commercial purse seine fishing at any time.

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