TRADITIONAL KNOWLEDGE AND HARVESTING OF SALMON BY *HUNA* AND *HINYAA* TLINGIT

Final Report

FISHERIES INFORMATION SERVICE (FIS) PROJECT 02-104

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***Lingit* transcription and translation by Kenneth Austin**

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FINAL REPORT SUMMARY PAGE

Title: Traditional Knowledge and Harvesting of Salmon by *Huna* and *Hinyaa* Tlingit

Study Number: FIS 02-104

Investigator(s)/Affiliation: Steve J. Langdon/University of Alaska Anchorage, Department of Anthropology, Kenneth Austin, Hilo, Hawaii.

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Abstract: Tlingit traditional knowledge of and practices with salmon have developed over thousands of years of residence in southeast Alaska. Through centuries of use, Tlingit developed a successful system of utilization built on sophisticated observations and distinctive concepts. This report provides an overview of that knowledge and those practices including comparative information on *Huna* and *Hinyaa* Tlingit information on salmon biology, distribution, timing, habitat, behavior, principles of sustainability and the mythic charter that informs traditional Tlingit relations with salmon.

Key words: Traditional knowledge, Tlingit, salmon, biology, harvesting, traditional concepts, cultural practices, relational sustainability

Project data: Data for this study consist of tapes and transcripts of interviews conducted with Tlingit elders and scholars. Some of the interviews were conducted in Tlingit. Additional information was obtained by guided site visitations with Tlingit salmon experts. Tapes, transcripts and photos have been archived with the University of Alaska Anchorage, Department of Anthropology, 3211 Providence Drive, Anchorage, Alaska, 99508.

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The excellent sketches appearing in the report were made by Wanda Culp in Hoonah and James Rowan in Klawock. Many thanks to both of them for their fine work.

The interpretations and any mistakes in the report are the sole responsibility of Dr. Langdon.

EXECUTIVE SUMMARY

This report provides an overview of aspects of Tlingit traditional knowledge and harvesting of salmon derived primarily from interviews of Tlingit elders and scholars. Tlingit language, oral tradition and archeological evidence indicate that their occupation of the region known as southeast Alaska spans a minimum of 6,000 years. Mass harvesting techniques for catching salmon date back to over 4,000 years ago. Over that time, Tlingit have developed concepts and practices for the utilization of salmon that sustained their relationship with the five species (*Oncorhynchus sp.*) upon which they were primarily dependent for survival and cultural livelihood. Tlingit captured and utilized salmon in a variety of habitats and locations from the ocean to the spawning grounds and from Yakutat Bay in the north to Dixon Entrance in the south.

A comparative approach was taken to this research in that information from Tlingit elders and scholars in the northern and southern portions of Tlingit territory was obtained through formal interviews. Thirty-three elders and scholars in Hoonah (*Huna káawu*) and Klawock (*Hinyaa kwaan*) were interviewed; some of the interviewing was conducted in the Tlingit language from interviewees who felt comfortable in using it. By using the Tlingit language where possible, the intent was to identify specific Tlingit concepts and observational frames through which knowledge about salmon was interpreted. A number of specific Tlingit concepts, including the central concept of *ish*, were identified through these procedures. Comparison of information from the two areas reveals both strong patterns of similarity as well as notable elements of difference.

Traditional knowledge includes both a range of information that can be characterized as biological and ecological but also includes additional knowledge that is organized according to the concepts present in the language and culture of the group. Traditional knowledge in turn informs and mobilizes specific practices toward salmon that range from instructions on where to gaff the salmon body to ritual acts required to regenerate salmon. Tlingit traditional knowledge and practices are grounded in the understanding that salmon are feeling, sentient beings like humans and must be treated with respect to insure that they will return again to their home streams. These practices constitute a system of relational sustainability, the Tlingit approach to insuring salmon existence and abundance.

Tlingit traditional knowledge of salmon summarized in the report includes observations on changes in species distribution in various streams, changes in abundance levels, variation in size, timing, and behavior, impacts of various other species on salmon, and habitat characteristics. The concept of *ish,* freshwater pools of slow moving water, is an important dimension of the Tlingit conception of and relationship with salmon.

Tlingit behaviors toward salmon are discussed under the headings of engagement, protection and productivity. Engagement refers to how Tlingit conceive of salmon as sentient beings like humans and how they should be treated. Protection refers to actions taken to insure that salmon in the streams will be allowed to mature and travel back to the ocean. Productivity refers to concepts and behaviors used by Tlingit to provide for salmon abundance including distinctive techniques such as stock transfers, "streamscaping" and predominately male harvests.

Tlingit developed a system of salmon allocation and utilization that includes a number of elements. Clan groups owned salmon streams or harvesting locations. Their clan histories and *at.oow* (objects representing clan heritage) provide "deeds" to the territories. *Heen saati's,* stream trustees, were empowered to make decisions about when, where, how and how many salmon to take. The success of a group in taking care of their stream, making it an attractive habitat for salmon to return to, was measured by the abundance of return. Respect for salmon was a key cultural value enforced through the mythic charter of the Salmon Boy that informs Tlingit about how they must behave toward salmon. Respect for salmon includes taking only what is needed, avoidance of waste, careful handling, not playing with or harming salmon, sharing and communicating respect for salmon through cultural performances of thanks. Traditionally salmon bones were returned to the stream to insure that salmon would be able to re-generate and return. Tlingit have a concept of balance that identifies appropriate run size and appropriate relationships between salmon and other species such as ducks, Dolly Varden and beaver.

While traditional Tlingit knowledge and use of salmon is organized in a different manner than contemporary scientific knowledge and use, there is a considerable pool of knowledge about specific systems and in stream salmon behavior and habitat that could be beneficially applied by managers to current relations with salmon. The best means to accomplish this would be through the establishment of formal relations with tribes.

I. INTRODUCTION

The Tlingit (*Lingit* in the orthography of their language) are the indigenous people of the northeastern Pacific coastal region from Dixon Entrance and Portland Canal in the south to the vicinity of the Bering River on the north. Tlingit groups developed and demonstrated a distinctive and successful cultural adaptation to this region of temperate rain forest. "Tides people", one possible translation of *Lingit,* emphasizes that the focus of Tlingit life was coastal and maritime. Tlingit oral traditions indicate that different groups of people moved into the island and mainland areas of southeastern Alaska from various directions and at various times in the past. While the earliest period of Tlingit arrival is uncertain, human populations have occupied coastal southeast Alaska for over 10,000 years as demonstrated by archeological findings from Groundhog Bay (north shore of Icy Strait) and On Your Knees Cave (northern Prince of Wales Island). Linguistic evidence suggests that Tlingit is an amalgamated language created by the merging of a number of distinct speaker groups that separated from a proto-Athabascan stock approximately 6000 years ago and migrated from interior northwest North America to the coast (Krauss 1973). Spruce root baskets dated to over 5000 years ago discovered in the intertidal estuary of the Thorne River on the east side of Prince of Wales Island exhibit precisely the same manufacturing techniques as those presently being constructed by Tlingit basket makers (Croes 2001). Based on this evidence, it is defensible to estimate that Tlingit presence in the southeast Alaska region could well span 6000 years.

While there are many maritime and coastal resources that Tlingit acquired, utilized and developed knowledge and concepts about, salmon (*x̲aat*) were the mainstay of their diet and the resource most critical to the rich and complex cultural forms they practiced and continue to practice today. A 6000-year presence in the region helps comprehend how the utilization of, concepts about and practices concerning salmon are central to Tlingit life and belief. Documentation of the knowledge and perspectives emergent in contemporary Tlingit people from this heritage is an important intellectual goal in and of itself. Determining how that knowledge and perspective can inform present and future practice with salmon in this region is also an important intellectual and practical goal, but not without significant challenges.

The research reported in this document was designed to make a contribution to the two overarching questions posed immediately above. How do Tlingit conceive of, interact with, and utilize salmon? In what ways do orientations and concepts built on thousands of years of interaction and oral transmission of knowledge inform traditional Tlingit practice toward salmon? What beliefs and practices can be learned from interviews with Tlingit speaking elders and from site visitations with Tlingit guides to the places where they interact with salmon? In what ways can this knowledge inform our current understandings, open up new avenues of inquiry, and bring into focus alternative means for enhancing the relationship between people and salmon in southeast Alaska? What can this information tell us about the history of salmon and people in southeast Alaska and how has that history been channeled by human action?

A. Research Objectives

This research was funded with the intent to acquire information concerning Tlingit knowledge about salmon behavior, knowledge about past and present distribution and abundance of different salmon species, and perceptions of change as well as the causes for changes in salmon populations. Information on harvesting technologies, locations and practices along with utilization patterns were also included in the topics that informed the questions asked of interviewees. Specific objectives to which the research was addressed included:

1) variation in knowledge concerning salmon species distribution in streams between state and federal biologists and local elders and experts;
2) differences in harvests and practices between Tlingit residents of Hoonah and Klawock;
3) means of "regulating" access and quantities in Hoonah and Klawock;
4) long term changes in stream characteristics, species distribution, and abundance as observed by local elders;
5) reasons for changes and documentation of other relevant dimensions of "traditional ecological knowledge" concerning salmon in Hoonah and Klawock.

Additional research on contemporary salmon subsistence uses in Hoonah including harvesting practices, locations and quantities was conducted by the Alaska Department of Fish and Game, Division of Subsistence in conjunction with this research.

B. Methods

The primary methodology employed in the research was the focused interview. A copy of the interview protocol is provided in Appendix A at the end of the report. The use of Tlingit as the interview language was done primarily in Hoonah. Mr. Austin's presence made it possible for questions and follow-ups to be in Tlingit for many of the Hoonah interviewees. In addition, there are a greater number of elders who speak Tlingit residing in Hoonah than in Klawock. There were several Hoonah interviewees who did not speak Tlingit and English was used in those cases. In Klawock, while three interviewees were potentially able to converse in Tlingit, only two were willing to do so. Austin did not accompany Langdon to Klawock and therefore the question and answer exchange and follow-up that occurred in Hoonah in Tlingit was not possible in Klawock. The Tlingit spoken in Klawock is of a different dialect from that spoken in Hoonah.

In order to best approach "traditional" Tlingit knowledge and practice associated with salmon, a primary interview methodology was designed for this research to elicit concepts through narrative structures typically used by elder Tlingit. In order to accomplish this goal, interviews were conducted in the Tlingit language to the extent possible. Secondarily, the narrative structure was emphasized by initially presenting elders with broad queries. The interview began with the query – "Could you please tell us what you were taught about salmon as a child by your parents and relatives?" To this query, a majority of interviewees replied with a version of the Salmon Boy mythic charter discussed at greater length elsewhere in the report.

Following elicitation of teachings and narratives in Tlingit, more structured questions were asked in English to obtain answers to science-based questions. However, interviewees were asked to provide answers of greater elaboration if they felt more comfortable in doing so.

Another methodology employed in the research was on-site visitation and guiding by consultants with special clan relations to certain areas. Langdon was fortunate enough to be guided by Thomas and Patrick Mills to the subsistence fishing locations on the Neva River in Excursion Inlet, a stream owned by their father's clan, *Wooshkeetan*, and on which they were raised. In Klawock, thanks to vessel support provided by Terry Fifield of the Craig Ranger District of the Tongass National Forest, Langdon (and two

research assistants) were able to be guided by elder Theodore Roberts to an intertidal stone fish trap site on Tuxecan Island from which Mr. Roberts had procured salmon as a young man and to a smokehouse in Tokeen Bay where Mr. Roberts had assisted in drying dog salmon obtained from a nearby stream as a young man. Langdon's previous field work and site visitations in both *Huna Káawu* dating back to 1980 and *Hinya kwaan* dating back to 1973 provided a range of contacts and backdrop of previous knowledge on which to draw to elaborate and extend the information gathered through the interviews and allow inquiry on various topics during the site visits.

Selection of the interviewees was in part based on the long-term experience of Langdon in Klawock and Langdon and Austin (a member of the *Huna Chookaneidí* clan raised in Hoonah) in Hoonah. This extensive previous experience provided a basic framework for identifying knowledgeable elders who would be appropriate to interview in each community. In the case of Austin, it also provided a comfort level with many elders who were relatives and knew him as a child growing up in the village. In addition, in association with the authorization of the research, the Klawock Cooperative Association and the Hoonah Indian Association assisted in the identification of potential knowledgeable elders. Contacts were made by telephone in the community and subsequently followed by in person visits in which the purpose of the interview was presented and the consent form describing the research given to the interviewee. Interviews were conducted in several locations depending on the wishes of the interviewee. In Hoonah, interviews were held primarily in the homes of interviewees or at the location where Langdon and Austin were staying. In Klawock, interviews were conducted in the homes of interviewees, the offices of the Klawock Cooperative Association and in the offices of the City of Klawock.

In order to comprehend the range and structure of "traditional" Tlingit knowledge concerning salmon, both male and female interviewees were sought. This commitment to acquisition of male and female viewpoints was informed by the relatively strict traditional separation of male and female responsibilities and practices with salmon characteristic of Tlingit elders. Since information about salmon characteristics were broadly elicited, male perceptions based on harvesting responsibilities and female perceptions and understandings based on processing responsibilities were required. The

sharp separation of “traditional” Tlingit gender roles in regard to interactions with salmon are evident in the interviews yet there are also significant areas of overlap or shared information as well.

Research assistants were identified in both communities who aided in making contacts, in conducting the interviews, and in facilitating the research process in other ways. In Hoonah one of the additional aims of the project was to provide an opportunity for a younger *Huna* person to work on Tlingit language development in hearing, comprehending, transcribing and translating materials. Angela Sharclane worked on Tlingit transcription with Austin before and after interviews in Hoonah and provided assistance on transcript preparation following the completion of the interviews. In Klawock, Yarrow Vaara, a college student at UAS from Klawock and majoring in anthropology was hired as research assistant.

Interviews were recorded on audio tape and copies of all tapes made upon return to Anchorage. A total of 37 interviews were obtained for this research. Twenty are from Hoonah or Hoonah affiliated persons and thirteen from Klawock or Klawock affiliated individuals. There were two interviews in which husband and wife jointly participated. Due to funding limits, only slightly over half of the tapes have been transcribed.

Mr. Austin prepared nine of the Hoonah interviewee tapes with extended amounts of speaking in Tlingit and began the arduous process of transcription and translation. Other tapes that had little or no Tlingit were transcribed in Anchorage.

A list of interviewees from both communities, the amount of Tlingit speech utilized in the interview, and whether or not a transcript has been prepared of the interview is found in Appendix B at the end of the report.

In addition to the primary interviews acquired through this research, the report draws upon previous research by Langdon in both communities. References to relevant information contained in other books, papers, and reports are offered where appropriate but no systematic literature review was undertaken in which to situate the findings of this research.

Visual materials have been included in the report that illustrate a variety of the topics addressed. The vast majority of these images were acquired or prepared by Langdon during previous research activities or during the present research.

Finally, James Rowan in Klawock and Wanda Culp in Hoonah were contracted to provide sketches of technologies, locations, and practices described verbally by the interviewees. Through these illustrations, a greater comprehension of the information through visualization can be acquired. A number of their sketches appear in the report.

C. Tlingit Populations and Areas: *Huna Káawu* and *Hinya Kwaan*

Tlingit society is organized through a number of concepts and units based on them. Social organization is based on people becoming members of named units based on their mother's membership. Two divisions, known in the anthropological literature as moieties, provide an initial basis for subdivision. One side is known throughout the Tlingit nation as Raven and other side is known as Eagle among the Tlingit north of Frederick Sound and Wolf among the Tlingit south of Frederick Sound. Moieties are organizationally crucial in that one can only marry a person from the opposite side. Upon this principle are built pivotal processes of reciprocating service and gifting (payment) between the two sides. Moieties are in turn divided into entities known as clans which are named, property owning units that constitute the fundamental sociopolitical units of war, peace, and social process. Clans have oral traditions that account for the appearance, migration and other key aspects of their history. Clans are further divided into house (*hit*) units that are the basic socioeconomic units of production and consumption in Tlingit society. A fuller treatment of the organization and processes of Tlingit society can be found in Emmons (1991), De Laguna (1972) and Dauenhauer and Dauenhauer (1994).

Tlingit society was organized sociogeographically according to the concept of *kwaan.* A *kwaan* consists of a set of clans who recognize the special relationship between themselves due to marital ties, ceremonial ties, historical ties, and co-occupied territories. Truce prevails among the clans of a *kwaan.* Tlingit society consists of 13-15 kwaan units depending on the historical period. The *kwaans* fall into northern and southern groupings based on their locations as well as patterned variation in dialectical differences and traditions of historical interaction.

In order to compare and contrast traditional Tlingit salmon knowledge and utilization, research communities were selected from the northern and southern areas of the Tlingit region. *Huna Káawu* (a locally distinct terminology for this group equating

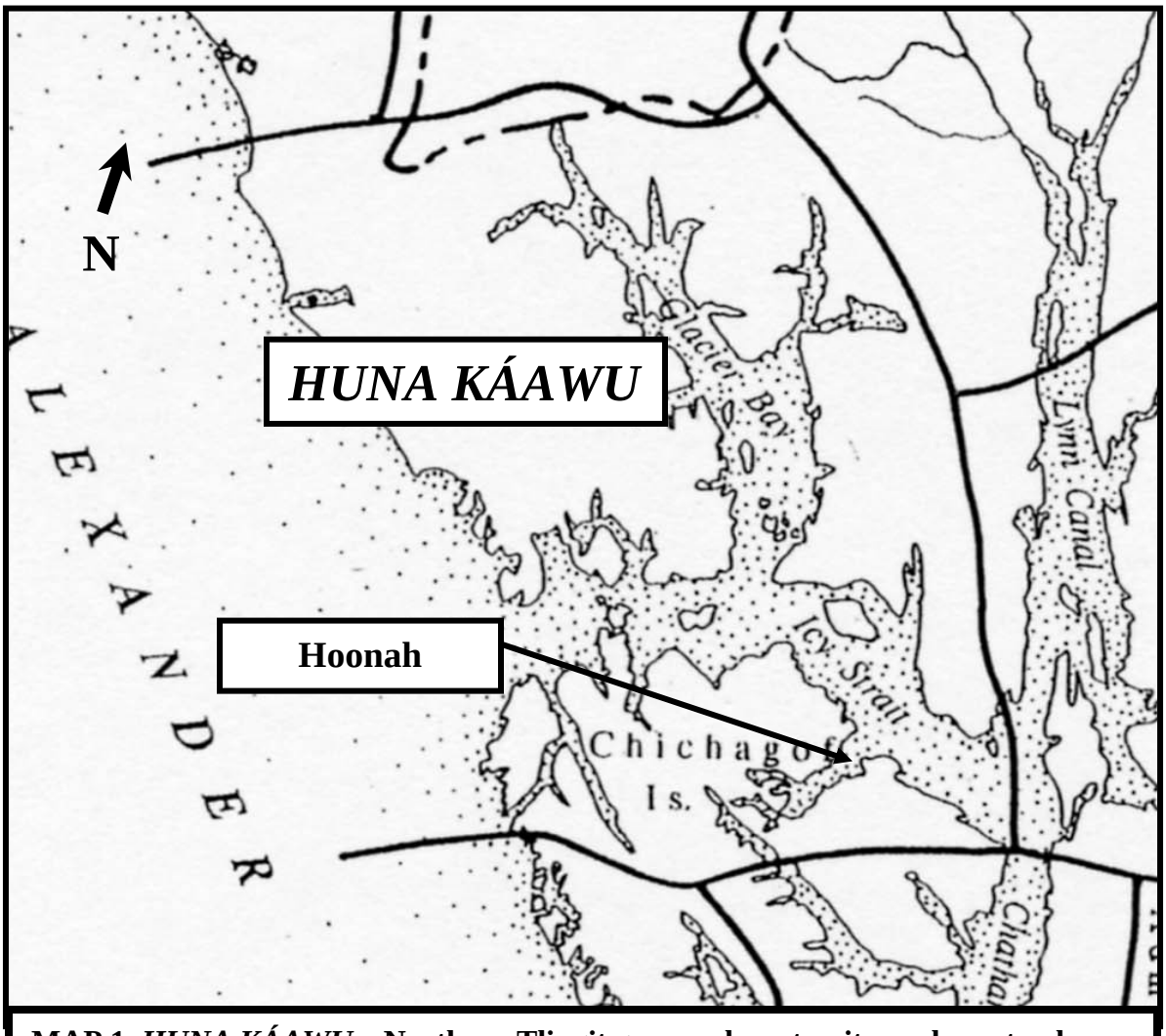
with *kwaan*) is in the northern area and *Hinyaa Kwaan* is in the southern area. Brief introductions to each population and their focus communities of Hoonah and Klawock respectively are presented below accompanied by a listing of the streams mentioned by interviewees in each community.

HUNA KÁAWU

The Tlingit homeland known as *Huna Káawu* (*kwaan)* encompasses lands and waters on the west from north of Lituya Bay on the Gulf of Alaska coast to the vicinity of Lisianski Strait that separates Yakobi Island from Baranof Island on the south. Lands and waters adjoining the entirety of Cross Sound and Icy Strait from Cape Spencer to Point Augusta fall in their traditional territory. Included are several major embayments and the lands around them. Along the mainland coast on the north side of Cross Sound and Icy Strait are from west to east Taylor Bay, Dundas Bay, Glacier Bay and Excursion Inlet while on the south side of Cross Sound/Icy Strait are found Lisianski Strait, Port Althorp, Idaho Inlet, Mud Bay, and Port Frederick. Along the east coast of Chichagof Island, *Huna Káawu* includes Freshwater Bay and some of Tenakee Inlet.

The region is one of the most geologically active areas of Alaska primarily due to the ebb and flow of massive quantities of glacial ice up and down Glacier Bay. In 1794 George Vancouver encountered a massive wall of ice at the entrance to Glacier Bay and was unable to advance above Bartlett Cove. In the two centuries since, the glaciers have retreated over 60 miles to the heads of Muir and Wachusetts Inlets. Glacial retreat has been followed by considerable tectonic uplift in certain areas that has radically transformed land/sea relations and resulted in dramatic changes in landscapes and ecosystems. Geological evidence and oral tradition from the *Huna* Tlingit demonstrate that this is not the first time that glacial advance and retreat have dramatically changed this region (Austin 2003).

Within *Huna Káawu* are found some of the oldest sites demonstrating evidence of human occupation in southeast Alaska. Groundhog Bay, located on the north shore of Icy Strait west of Point Couverden is the location of archeological sites dated to approximately 10,000BP. On the Dundas River west of Glacier Bay is a site dated to over 7,000BP. *Huna* oral traditions include accounts of times when the glaciers flowing



MAP 1 *HUNA KÁAWU* – Northern Tlingit group whose territory also extends south on Chatham Strait to Tenakee Inlet (not correctly depicted above).

from Glacier Bay nearly reached Point Adolphus and people had to travel under ice to transit back and forth down Icy Stait (AJM TR). The waters of Icy Strait presently are shallow in the vicinity of Point Adolphus due to the glacial moraines deposited there that indicate the accuracy of the *Huna* account.

The *Huna* Tlingit lived in widely dispersed winter villages with at most 6-8 substantial plank homes at the time of European exploration in the area. From the winter villages, they dispersed seasonally to various camps to acquire bottomfish, intertidal organisms, marine mammals, terrestrial mammals, and berries. From late spring to fall, they moved to various salmon streams owned on a clan and house basis to harvest and

process the series of runs that returned each year. While most processed salmon were returned to winter villages at locations other than where they were acquired, several winter villages were located in close proximity to sockeye and coho salmon streams where harvesting on a small scale continued into the winter.

The *Huna* recognize four traditional clans as resident within the homeland and therefore as owners of lands and waters within their collective territory. On the Raven side of the Tlingit moiety division are the *T'akdeintaan* whose oral traditions place their origins in Lituya Bay. They were outer coastal people whose territory included all the Gulf of Alaska coastal portions of *Huna Káawu* and extended along the mainland shore of Icy Strait to Point Carolus. The Eagle side of the Tlingit moiety division includes three clans. The *Chookaneidí* are recognized as the traditional occupants of most of Glacier Bay and take their name from a prominent sockeye and coho stream located on the west coast of Glacier Bay in what is now referred to as Berg Bay. The *Kagwaantaan* occupied the north side of Icy Strait from Excursion Inlet to Point Couverden with a village located at Grouse Fort. The *Wooshkeetaan* occupied the southeast entrance to Glacier Bay then eastward to Excursion Inlet with another branch located in Tenakee Inlet utilizing the eastern shores of Chichagof Island north to Point Augusta.

The 1880 census reports that five villages of *Huna* comprised 900 residents making it the second largest Tlingit group at the time. Between 1880 and 1890, massive disease and death swept *Huna Káawu* reducing the population to about 425 by 1890. With the coming of missionaries and other governmental actors as well as economic change associated with the coming of the canned salmon industry, a process of consolidating the dispersed *Huna* population in the village of Hoonah, a relatively recently established community, began around 1900 and continued until the second half of the 20th century.

At present, the village of Hoonah, located in Port Frederick on the northeast coast of Chichagof Island, is the only community where *Huna* and other Tlingit comprise the majority of the population. Many other *Huna* currently reside in the larger nearby communities of Juneau and Sitka.

TABLE 1 SALMON STREAMS IN *HUNA KÁAWU* AND OTHER AREAS MENTIONED BY HOONAH INTERVIEWEES

Tlingit Name	Translation or Current name	Location
Keidladi Heeni	**“**Seagull Stream”	Port Frederick
Xoots Heeni	**“**Brown Bear Stream”	Port Frederick
X’aka Heen	“Outer Mouth Stream”	Port Frederick
Shaakeixi Heen	Unknown	Port Frederick
	Game Creek	Port Frederick
	Humpy Creek	Port Frederick
	Neka River	Port Frederick
	Dalton Creek	Port Frederick
	Airport Creek	Port Frederick
Gaat Heeni	**“**Sockeye Stream”	Port Frederick
Lakoox Has’ T’aak Heen	“Creek Inside the Sisters”	Spasski Bay, Icy Strait
Gaat Heeni	**“**Sockeye Stream”	Glacier Bay
Chookenheeni	**“**Tall grass stream”	Glacier Bay
	Bear Track Cove	Glacier Bay
	Geikie Inlet	Glacier Bay
	Neva River	Excursion Inlet
	Excursion River	Excursion Inlet
	Stream Near Excursion River - East	Excursion Inlet
	Stream Near Excursion River -West	Excursion Inlet
	Duncan’s Camp Stream	Excursion Inlet
	Village Point Stream	Homeshore, Icy Strait
	Dundas River	Dundas Bay, Icy Strait
	Point Carolus Stream	Point Carolus, Icy Strait
Haaktaheen	“Wake of the Little Bird Stream”	Yakobi Island
	Surge Bay Stream	Yakobi Island
	Flinn Cove Stream	Flinn Cove
	Eagle Point River	Eagle Point

Tlingit Name	Translation or current name	Location
	Stream west 1	Point Adolphus
	Stream west 2	Point Adolphus
	Head of Mud Bay	Mud Bay
	Head of Idaho Inlet	Idaho Inlet
		Port Althorp
		Soapstone Cove
T'a Heen	**"**King salmon River"	Swanson Harbor
Kuk Heen (?)	Hidden sockeye stream	Between Freshwater Bay and Tenakee Inlet
	Basket Bay stream	Basket Bay
	Freshwater Bay stream	Freshwater Bay
S'aagu Heen	Main River, head of inlet	Tenakee Inlet
Tlaguu Heen (?)		
	River opposite Tenakee village	Tenakee Inlet
	Pavlof Harbor	Tenakee Inlet
	Crab Bay	Tenakee Inlet
	Salt Creek	Tenakee Inlet
	Long Bay	Tenakee Inlet
	Corner Bay	Tenakee Inlet
	Hawk Inlet	Admiralty Island
	Chilkat River	Upper Lynn Canal
	Stikine River	Central Mainland

HINYAA KWAAN

The southwestern boundary region of Tlingit territory abutting the *K'yakaani Haida* in the Prince of Wales Archipelago was occupied by the *Tlawah kwaan* and the *Hinyaa kwaan.* Formerly separated into two *kwaan* divisions, the descendants of these groups now claim the village of Klawock as the capital of their homeland. Following smallpox epidemics in the 1860s, remnant clan segments from the *Kooyu kwaan* also joined with *Hinyaa* clans at Tuxecan. The amalgamated group will be referred to as the *Hinyaa*

kwaan in this report. Land and waters falling within the *kwaan* territories of these two groups included the extreme southeastern area of Kuiu Island (up to Port Beauclaire), and the entire western coast of Prince of Wales Island down to Ulloa Channel. Islands to the west of Prince of Wales proper separating it from the Gulf of Alaska also were included ranging from Kosciusko Island on the north to Suemez Island on the south. Both Coronation Island and the Hazy Islands, located considerably offshore, were claimed and utilized by *Hinyaa* clans.

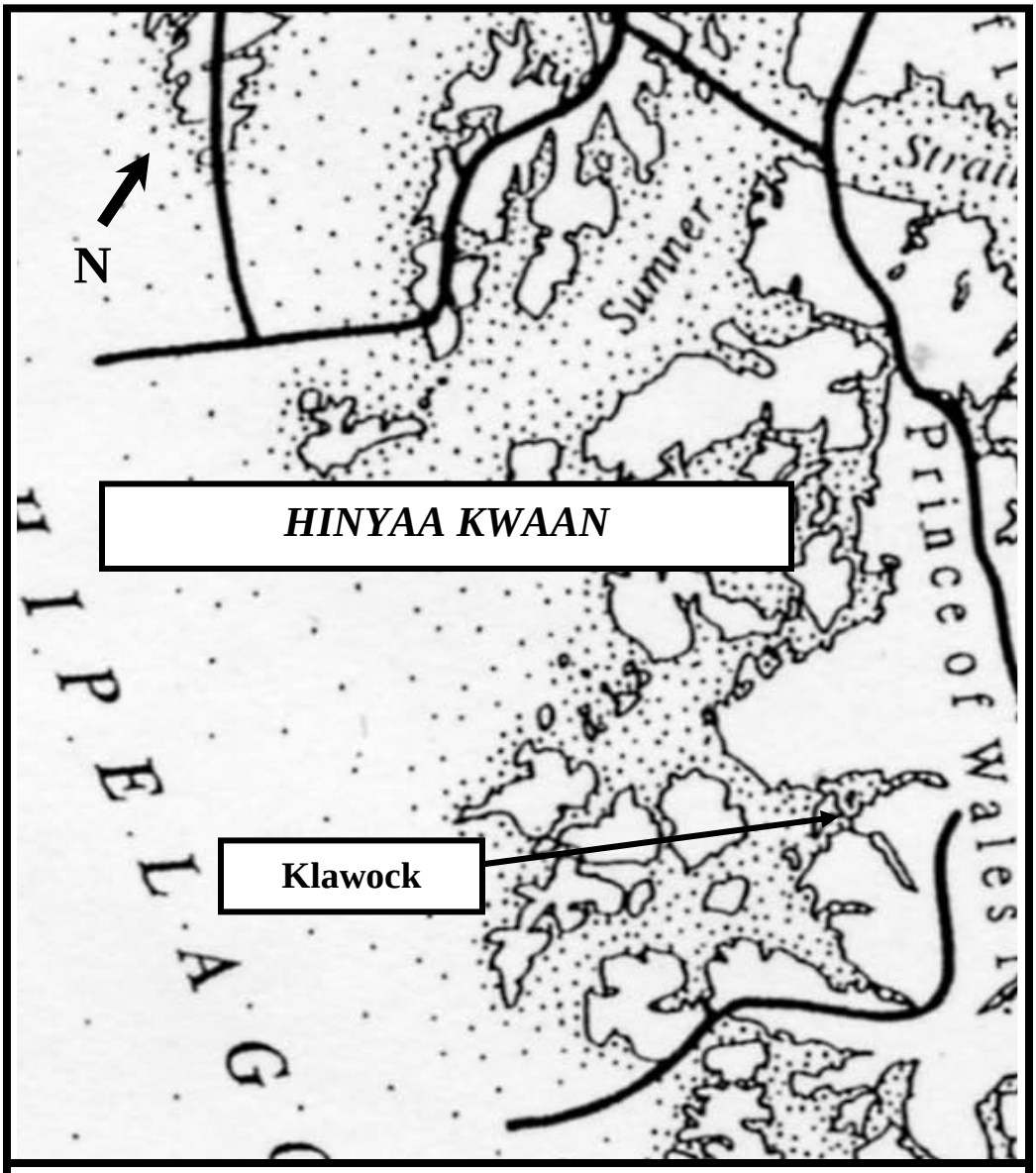
Compared to *Huna Káawu, Hinyaa kwaan* is a much less geologically active region with minimal evidence of glacial activity in the last several thousand years. There is evidence indicating early Holocene glacial retreat in the region but sea level has been relatively stable for the last 4-5,000 years. In 1775, Spanish explorers entered the region from the Gulf of Alaska via Bucareli Bay (Spanish name) and thought they observed volcanoes in the area but they were more than likely mistaken. In their reports, the Spanish officers referred to the broad, placid opening of Bucareli Bay as welcoming but they did not encounter any *Hinyaa*. They recommended further investigation of the area as a possible location for a north Pacific Ocean outpost. In 1779, a large Spanish exploration of the area took place but no plans for establishing Spanish settlements in *Hinyaa kwaan* ever materialized.

Hinyaa kwaan also includes extremely significant archeological sites relevant not only to the prehistory of southeast Alaska but also to the question of the earliest peopling of the Americas. At the north of Prince of Wales Island proper are deep karsitic caves in which human remains and stone tools have been discovered also dated to about 10,000 years ago. These sites have prompted inquiry into the question of whether there was an outer coastal route by which early immigrants could have made their way down the Pacific Coast and spread inland below the ice sheets in the vicinity of Puget Sound. Another key site in the region is located on Heceta Island where remains from offshore fish like cod and halibut from about 8,000 years ago demonstrate that a maritime adaptation had developed. The 8,000 year old site, however, does not display any salmon bones and therefore the issue of the presence and role of salmon in southeastern Alaska in the first half of the Holocene Period (10,000-5,000 years ago) has become an important unanswered question. Shortly after 4,000 years ago, wood remnant stakes buried in the

intertidal mud in bays and estuaries of the north end of Prince of Wales Island indicate that humans had begun constructing large features to channel and capture mass quantities of salmon (Moss and Erlandson 1998).

Hinyaa Tlingit shared basic parameters of existence with the *Huna* Tlingit with seasonally patterned movements from winter villages in protected locations to seasonal resource sites. Two major sockeye systems on Prince of Wales Island proper – the Klawock River and Sarkar Lakes – appear to have been previously occupied as winter villages but may not have been in the 19th century. Tuxecan, located on the northern shore of Prince of Wales Island within five miles of Sarkar was the largest *Hinyaa* village in the late 19th century but there were a number of other small winter villages as well. This consolidation appears to have begun occurring earlier than among the *Huna* Tlingit resulting from the massive loss of life due to smallpox in the 1830 and again in the 1860s.

The clan composition and history of the *Hinyaa* and *Tlawaah kwaans* is complicated by demographic collapse and relocation. However, in the middle of the 19th century there appear to have been three major Raven clans in the region. The area around modern Klawock was owned by the *Gaanaxadi* who also controlled the area to the south up to where the Haida claims begin. Included in this territory was the critically important site of *Shaanda,* the location of abundant herring spawning each spring. A second major Raven clan is the *L'eeneidi* who occupied the northern portion of Prince of Wales Island from El Capitan Passage northward. There appear to have been at least two recognized subdivisions of the *L'eeneidi* – the *Sukteeneidei* who occupied the southeastern part of Kuiu Island and portions of Kosciusko Island and the *Ti'lhitlitaan* who occupied both sides of El Capitan Passage from Calder Bay eastward. A third Raven clan, the *Takuaneidi,* occupied Heceta Island southward on the outer coast to perhaps Baker Island. Two major Wolf clans are generally recognized – the *Shunkweidei* who ancestrally married the Klawock *Ganaaxadi* and had a winter village on St. Phillip's Island. They controlled the Prince of Wales shoreline between the *Ganaaxadi* territory on the south almost to Tuxecan. The other major Wolf clan was the *Kakoshittan* who owned the Sarkar Lake area and portions of nearby Tuxecan Island.



MAP 2 ***HINYAA KWAAN*** **– consolidated territory of three kwaans encompassing central and northwestern Prince of Wales Island, the islands to the west and southeastern Kuiu Island**

The 1880 census lists about 500 *Hinyaa* Tlingit in three settlements. In the early 1900s, as in *Huna Káawu,* missionaries and government agents sought the consolidation of the *Hinyaa* at Klawock where a major cannery had been in operation since 1878 on the

TABLE 2 Salmon Streams in *Hinyaa Kwaan* and Other Areas Mentioned by Klawock Interviewees

Current name	Tlingit name	Location
Klawock River		Klawock Inlet
Half-mile Creek		Klawock Lake
Three-mile Creek		Klawock Lake
No name Creek		Klawock Lake
Coho Creek		Klawock Lake
Canoe Pass Creek		Canoe Pass
Crab Bay Creek		Crab Bay
"Marten Creek"		Port Saint Nicholas
Trocadero Creek		Trocadero Bay
Little Salt Lake Creek	***Gaks heen***	Little Salt Lake
Shinaku River	***Shinaku***	Shinaku Inlet
Black Bear Creek		Big Salt Lake
"Steelhead Creek"	***Ashut heeni***	Big Salt Lake
11-mile Creek		San Christoval Channel
San Clemente Creek		Portillo Channel
Nossuk Creeks (several)		Nossuk Inlet
Sarkar	***Saa kaa***	Sea Otter Sound
Warm Chuck Creek		Heceta Island
Staney Creek	***Sdeini heeni***	Tonowek Narrows
Kugun Creek		Tuxecan Island
Karheen Creek	***Ka' heen*** ("War Creek")	Tuxecan Island
Tokeen Creek		Tokeen Bay
Sarheen	***Sa' heen***	El Capitan Pass
Calder Creek	***Suk heeni***	Calder Bay
Shipley Bay Creek		Kosciusko Island
Port Beauclaire		Kuiu Island
Stikine River		Central Mainland

largest sockeye system on the island. Consolidation at Klawock was completed in the 1930s by US marshals threatening outlying *Hinyaa* who continued to live at Warm Chuck, Karheen, Shakan and Deweyville (Sarkar).

At present, the village of Klawock, located at the mouth of the Klawock River on the northeast coast of Chichagof Island, is the only community where *Hinyaa* and other Prince of Wales Tlingit comprise the majority of the population. Many other *Hinyaa* currently reside in the larger nearby communities of Craig, Wrangell and Ketchikan.

D. Report Overview

The materials presented in the report are organized as follows. The next section (II) presents Tlingit observations on salmon distribution, stream characteristics, and harvesting patterns. Tlingit experts discussed the stream characteristics in relation to salmon for over 80 streams between the two areas. A variety of observations on the history of species in certain specific streams, habitat changes to streams, and unique or distinctive aspects of stocks in terms of timing, appearance and anomalies are presented. Section III discusses the manner in which Tlingit society established institutions and organized practices among themselves to utilize and maintain salmon. Section IV discusses emergent themes and concepts that have been identified in the interviews and are organized as **engagement, protection, productivity** and the ***ish***.

Engagement is the concept utilized to characterize the relations with salmon Tlingit practiced as founded on the Salmon Boy mythic charter. The mythic charter establishes the basic concepts and understandings for Tlingit in how they are to relate to salmon. Salmon are perceived as sentient, attentive, volitional beings similar to humans. Tlingit thought conceives salmon as living as human "persons" in villages on the ocean bottom from where they depart to return to their home streams where it is humans responsibility to treat them respectfully, harvest and use them nonwastefully and return the salmon bones to the stream in order that the salmon might be regenerated, return to their home and subsequently once again travel to the home stream. This system of thought, termed **relational sustainability** provides Tlingit guidance and is enforced by the possibility of dire results if the principles are violated.

Under the concept of **protection** various Tlingit observations and practices associated with predators or other species interactions with salmon are discussed. Tlingit

engage in a number of interventions with various species in order to establish “balance” (a specific Tlingit concept) in a stream.

The concept of **productivity** identifies and discusses various Tlingit practices that are undertaken to improve conditions for salmon abundance. These practices include stock transfers, “streamscaping” (manipulating stream conditions by moving rocks and boulders) and selective male harvesting.

The Tlingit term ***ish*** was presented in many interviews by Tlingit elders and scholars. While the concept has a specific geomorphologic/hydraulic definition – a deep pool of slowing moving freshwater in a stream or river – its permutations in Tlingit thought about salmon behavior, harvesting, streamscaping and other more metaphysical aspects of relational sustainability became apparent during the research.

Section V presents conclusions including a summary of Tlingit concepts, comparative perspectives concerning Hoonah, Klawock and other Tlingit relationships with salmon, a comparison of Tlingit and Western systems of relationship with salmon, questions for future research arising from the information presented and implications of the findings for salmon management as directed by various state and federal agencies.

Sources, bibliographic references and a listing of transcripts utilized, follow the body of the report. Two Appendices, one consisting of the research protocol and the other a listing of the interviewees by community, clan, and interviewee information, are provided at the end of the document.

In the text of the report, quotations of interviewees from this or other research are indented, italicized and single spaced. Tlingit words outside quotations are italicized but when they occur inside quotations, the Tlingit is presented in standard script.

II. TLINGIT INTERVIEWEE OBSERVATIONS AND HARVESTING PRACTICES RELATED TO SALMON AND STREAMS

Information from interviewee observations and practices related to salmon and streams are presented in this section. Part A consists of information obtained based on questions asked by the interviewer and information offered independently of interviewer questions by the interviewees. Part B presents information on the harvesting practices and technologies described by interviewees. Information from Hoonah and Klawock interviewees are presented when information is similar or different.

Tlingit terms for five different varieties of salmon are presented below. The terms provided from *Huna* and *Hinyaa* sources were the same. A detailed investigation of life stage terminologies was not undertaken but there are clearly a number of different terms that recognize life stages and different species characteristics in addition to the basic terms presented here. Several life stage terms are included in the table below.

TABLE 3 Tlingit Terms for Salmon, Steelhead and Trout

Generic	***Xaat***	salmon and/or fish
	X'wáat'	trout
Species		
King	***T'a***	*Oncorynchus tshawytscha*
Sockeye	***Gaat***	*Oncorynchus nerka*
Dog/chum	***T'il***	*Oncorynchus keta*
Coho/silver	***L'uk***	*Oncorynchus kisutch*
Pink/humpy	***Chaas'***	*Oncorynchus gorbuscha*
Steelhead	***Ashut***	*Hinyaa* term
	X'wáat' tlein	*Huna* term ("big trout")
Life stage		
Eggs	***Kahaakw***	
Spawned out	***Gaawsh***	red spawned out salmon, could be sockeye or coho in stream after spawning.
Dead	***Nuush***	

Note: **This is not an exhaustive set of terms – additional research with other interviewees would undoubtedly turn up additional terms in the life stage category and there may be variations in terms between areas as well.**

A. Observations on Salmon Distribution, Abundance and Change

Research findings based on interviewee reported observations on salmon and streams are presented in this section. Observations elicited through the interview protocol appear first and those offered independently by interviewees follow.

Interviewer Elicited Observations on Salmon Variability

A primary objective of this research was to identify Tlingit observations on salmon variability and identify areas in which those observations depart significantly from commonly held notions about salmon. Certain dimensions were formally addressed in the interview while other dimensions were offered by interviewees without solicitation. Dimensions about salmon variability formally addressed were:

- species distribution in streams;
- differences in species between streams (size, color, other characteristics)
- changes in species distribution;
- changes in abundance of species;
- changes in timing of runs;
- physical anomalies.

Additional dimensions about salmon variability that were offered by interviewees were:

- unusual run timing;
- unusual physical appearance of stocks;
- unique stock characteristics;
- changes in stream characteristics.

Each of these topics will be addressed in this section. The section will discuss observations from Hoonah and Klawock interviewees for each topic.

<u>Species distribution in streams</u>

In general, Tlingit interviewees ideas about the types of streams correspond with standard generalizations as offered by Montgomery (2004: 7), ie

- king salmon – “spawn in large mainstem rivers”
- sockeye salmon – “spawn in rivers in close proximity to lakes”
- coho salmon – “use smaller tributaries”
- chum salmon – “spawn in channels close to an estuarine environment”
- pink salmon - “spawn in channels close to an estuarine environment”

There are several variations to this pattern that Tlingit interviewees offered. Observations offered by the interviewees pertaining to sockeye salmon and to king salmon were particularly noteworthy. A list of all the salmon streams mentioned by Hoonah and Klawock interviewees can be found in tables on in Appendix C.

SOCKEYE IN *HUNA KÁAWU*

Hoonah interviewees offered several observations about the distribution of sockeye in various streams in *Huna Káawu.* A long-standing question concerns the status of the stream closest to Hoonah known presently as Garteeni Creek. This English rendering of Tlingit unfortunately is ambiguous. As noted earlier, the Tlingit term for fish or salmon is *x̲aat* while the term for sockeye salmon is *g̲aat.* When confronting the recent pronunciation and spelling of the stream during the 20th century, this ambiguity can be seen cropping up in the responses of interviewees. Thomas Jack (TJ TR) believes the present usage derives from the general term for salmon not the specific term for sockeye. Therefore the stream should be correctly termed "Salmon stream." He rejects the possibility that it stands for sockeye salmon based on the lack of sockeye salmon in the stream now and at any historical period available to him through information conveyed by his grandfather or father. Lily White, however, is of the opinion that the term is correctly interpreted as *G̲aat heeni* and therefore should be translated as "Sockeye Stream". Mrs. White states in response to a question about whether sockeyes were ever in the stream:

> *"It comes in. It used to come in…lots. Then it stopped. They don't know what happened to it. Right there, too. X̲'aka Héen. (Outer Mouth Creek.) Behind Halibut Island. They used to come in there, too."* (LW TR: 2)

In her statement Mrs. White indicates that not only did sockeye formerly ascend nearby Garteeni Creek in abundance but that sockeye also previously were found in the small stream on the west side of Port Frederick, near Halibut Island. Mrs. White cites her mother as the source of her information. Charles Jack supports Mrs. White's view that the name does mean that the stream as some point did support sockeye salmon (CJ TR: 33).

An additional complication with the term *G̲aat heeni* is that this is also the name of a stream in Bartlett Cove in Glacier Bay where *Huna* people resided, had smokehouses

and later participated in a short-lived commercial fishery in the 1880s and 1890s. At that time there were three named houses on the river. It appears that the village was abandoned sometime in the early 1890s likely due to being deluged by icebergs in Glacier Bay (Langdon 2001). The massive release of icebergs may have been triggered by a major earthquake that also shifted the stream channel enough to damage the sockeye run. While commercial capture of sockeye salmon from the Bartlett Cove stream continued for several years, there are no reports of sockeye salmon in that stream after the early 1900s. The population from that village seems to have resettled at Hoonah at that time and rebuilt the three houses with the same names and in the same spatial association as they had previously had in Bartlett Cove. Likewise when the *Kagwaantaan* relocated their houses from Grouse Fort on the north shore of Icy Strait to Hoonah in the early part of the 20th century, they too carried over the house names, their relative physical locations and their rankings to their new homes in Hoonah (Austin 2003). De Laguna (2000) reports a similar pattern upon movement and reconstruction in Yakutat. It is possible that the nearby stream was given the name *Gaat heeni* by *Chookaneidí* settlers to complete the transfer of existence of the *Chookaneidí* clan at that time without regard to the actual presence of sockeye salmon. This would be an event unprecedented in any Tlingit account of which I am familiar. The puzzle over the name Garteeni River continues.

There are other accounts about the previous occurrence of sockeye salmon in the streams of *Huna Káawu* as well. Noted above is Mrs. White's observation that sockeye were formerly in *X'aka heen* at the mouth of Port Frederick but have now disappeared.

Several interviewees commented on the existence of sockeye salmon in one of the small streams that runs into Neka Bay. In response to a question about from what locations his family had obtained sockeye, Karl Greenwald observed:

> *"We'd go for sockeye to our own place in Port Frederick and get them. It's up in Crab Bay. In fact, not until September does the sockeye go there. It's a good lake there, but the creek is so small it's dried up. There's no creek at all there. Not until September, 'til the rains come. And the creek will come. And the dogs will go in, the humpies will go in, the sockeyes will go in. Very late sockeye show."* (KGd TR: 19)

Thomas Jack observed that sockeye entered the main river in Neka

Bay and ascended to one of the four lakes that tie into each other at the upper reaches of the system. Mr. Jack observes:

> *"Neka Bay was a sockeye stream…It still is but it's early; it's an early run - April. We went up there April 20th, my dad's birthday, went up to the high tide ... a-l-l the way up. When we were fishing up there, we caught four sockeye ... April 20th everybody said there's no sockeye go up that creek. We caught four and brought them back down. There's four lakes back there; Neka Bay tributary has four lakes."* (TJ TR: 27)

It seems clear Mr. Greenwald and Mr. Jack are referring to different stream systems in approximately the same location of Port Frederick. The timing of the runs they describe is dramatically different but nevertheless outside of the normally expected temporal range of sockeye appearance. It is therefore likely that they refer to different locations and stocks.

One other stream in Port Frederick was cited by a number of Hoonah interviewees as having at one time supported sockeye salmon. One interviewee indicated that the stream had sockeye at an earlier point in time, then historically it did not, and now sockeye may be reestablishing themselves in the system. The stream is known as Seagull Creek – it appears with its Tlingit name in the earlier listing provided at the start of this section. Of Seagull Creek, Thomas Jack observes:

> *"There used to be [a sockeye creek] up in the salt chuck area but then a tree fell across it. It's just a small creek, there's a lake back there, used to be a sockeye stream. And the creek turned and it went out to Tenakee Inlet side, so there wasn't any fish in that lake any more. That log that fell across rotted out, so the creek is back on course and is coming out on this side again out in the bay [Port Frederick]. Now just cohos go up there, now just cohos up in that lake. But it used to be a sockeye stream. Sockeye and cohos used to be but not any more ... no sockeye now but they might come back."* (TJ TR: 27)

Charles Jack offers the following that parallels Thomas Jack's observations but includes some additional commentary and perhaps different locational information:

> *"We tell the Fish and Game there's a river up here by Seagull Rock. Sockeyes go up, but it's limited to the amount because it [has] so much blockage when you go up there. The way I learned about it is my uncle Gilbert Mills. [Quotes Gilbert] 'Well, nephew, you want to have boiled sockeye'? 'Yeah. Where you going to go'? I ask him. 'Oh, we'll go up the bay', he told me. So he showed me up the bay where we get the sockeye. Seagull Rock.*" (CJ TR: 31)

Ken Grant has a somewhat less certain view on exactly where the sockeyes formerly were at the head of Port Frederick, but it is in the same general area. Mr. Grant observes:

> *"There used to be. It became extinct. It's by Seagull Creek. Not Seagull Creek. Bear Creek. Up at Bear Creek, maybe. Anyway, it's a piece of land between Salt Chuck and the portage [to Tenakee Inlet] there. Maybe there's not enough water to come down or something like that… stream disappeared."* (KGt TR: 19)

While Mr. Grant is not as sure as Mr. Jack about the exact stream at the head of Port Frederick where sockeye used to be found, they have similar understandings about the environmental change that led to the disappearance of the run.

Many Hoonah interviewees were aware of the sockeye at *Haaktaheen* on the outside of Yakobi Island as well as a number of other sockeye streams along the outer coast up to Lituya Bay and in Dundas Bay. Moser (1902) documented that the Dundas Bay cannery was acquiring sockeye from virtually all of these streams in 1900. The disappearance of sockeye from these systems was not directly discussed by any Hoonah interviewee.

In the Glacier Bay portion of *Huna Káawu,* it is well known that *Chookenheeni* is a sockeye system. One observer known to visit the stream regularly stated that *Chookwan Héeni* now is extremely volatile in both run timing and run size with some years having virtually no fish.

Finally, sockeye systems were noted for two lakes that had no identifiable stream outlets. In both cases the interviewees indicated that the sockeyes were thought to enter through underwater caves or channels and travel to the lakes. One was located north of Bear Track Cove in Glacier Bay and the other along the Chichagof Island coast between Point Augusta and Freshwater Bay – this could refer to Kuk Creek of Basket Bay.

SOCKEYE IN *HINYAA KWAAN*

Klawock interviewee Theodore Roberts offered information on one additional sockeye stream that had not been previously generally known. It is located just south of Kugun Point on the east side of Tuxecan Island and is a small system. No other interviewee mentioned this system. Other than this one system, Klawock interviewees did not offer any observations on sockeye stocks that either were generally unknown or had previously been unknown. Interviewees were aware of the two major sockeye systems in *Hinyaa kwaan* and of the limited availability of sockeye in two systems, Warm Chuck Stream on

the southeast side of Heceta Island and Karheen on the southwest corner of Tuxecan Island. Theodore Roberts indicated that he had obtained sockeyes from Karheen one time since the 1950s. As a boy in the 1930s, James Martinez had lived at Karheen and obtained sockeye salmon for processing from that system (JM TR: 4).

KING SALMON IN *HUNA KÁAWU*

A recurring theme in the accounts of Hoonah interviewees was the former, and in a few cases continuing, presence of king salmon (*t'a*) in many of the surrounding streams. On this subject, Thomas Jack provided the following comment:

> *"…there's king salmon fish around here…king salmon creek in Tenakee, Game Creek, over in Hawk Inlet, Neka Bay over here, Excursion River, Swanson Harbor,* T'a heen, *Eagle Point River, Idaho Inlet, and up at Geikie Inlet where the hooligans go up…those are king salmon creeks."* (TJ TR: 9)

The streams that Mr. Jack mentions are generally the large stream systems in the region, and with the exception of Neka Bay, none of them are considered to have sockeye salmon. Noteworthy in Mr. Jack's observations is that the stream in Swanson Harbor where king salmon are said to occur actually carries the Tlingit name *T'a Heen,* "King salmon river."

The terminology, "those are king salmon creeks" appears to refer to past and potential as the king salmon are no longer found in a number of streams. Charles Jack provides the following comment on king salmon in Hawk Inlet:

> *"… in subsistence way, my grandfather had a smoke house at Hawk Inlet. King salmon used to go up that big river at the mouth. … My grandfather used to get king salmon from there and make dry fish out of it. He'd go in the fall during hunting season. At the same time, they get the king salmon while they're hunting. They were rendered out for one thing. 'Cause king salmon spoil real easy, so you got to make sure they're completely rendered out before you make dry fish out of it. We try to tell the Fish and Game about it; they don't believe it. But somehow they died off."* (CJ TR: 22)

Several other interviewees offered similar observations on the presence of king salmon in many streams of *Huna Káawu*. Karl Greenwald observed:

> "*There's king salmon in here. All the rivers have king salmon. But they're not really big runs, you know. They all have we'd say several hundred I think. And every one, Humpback Creek, Game Creek, Neka Bay and them have king salmon. But they're not like the Chilkat or Chilkoot."* (KGd TR: 34)

Mr. Greenwald goes to provide more information about king salmon in a prominent stream near Hoonah:

> *"In Humpback Creek I caught one about 35 pounds, you know. Black as heck, he looked ready to spawn so I put him back. You can get them late in the fall."* (KGd TR: 34)

In addition, long term Hoonah hand troller Floyd Peterson who was not interviewed for this report also asserts that king salmon are found in many of the streams noted by Thomas Jack and Karl Greenwald.

In contrast to the view that king salmon were present in many streams around Hoonah is the view of Lily White:

> *"The king salmon, though, they're always [in the waters around Hoonah]. In the winter time people fished for the king salmon. In this area, the king salmon did not go up the river."* (LW TR: 20)

Mrs. White is aware of the presence of king salmon in the salt water environment around Hoonah and that traditionally peopled trolled for them in the winter. However, her view is that king salmon do not enter streams in *Huna Káawu*.

While king salmon are no longer thought to be present in many of the streams identified, there are several streams that are still thought to have king salmon runs but they are considered to be small runs. Among the streams that are thought to continue to support king salmon runs are Idaho Inlet, Eagle Point River, Swanson River, Geikie River in Glacier Bay and two other rivers between Point Adolphus and Gull Cove.

King salmon are also well known by Hoonah interviewees to be found in Glacier Bay waters at certain times of the year. While commercial trolling on those stocks has declined considerably in recent years due to changes in season openings, those stocks were the basis for a substantial commercial hand troll fishery for Hoonah men from the 1950s into the 1980s (Langdon 2001). The only reference to a resident king salmon stock in Glacier Bay provided in the interviews was that Thomas Jack's comment about a run of king salmon to a stream in Geikie Inlet.

KING SALMON IN *HINYAA KWAAN*

King salmon are commonly caught in the offshore and inshore waters of *Hinyaa kwaan* at the present time. The areas around the San Lorenzo Islands (Hole-in-the-wall) and Forrester Island were among the earliest sites where the commercial salmon trolling

industry in the first two decades of the 20th century. Robert Peratrovitch (1958) describes techniques used for trolling by *Hinyaa* prior to and at the beginnings of the troll fishery. There is no question about *Hinyaa* familiarity with king salmon but no interviewee claimed that there were any former or current king salmon runs in Prince of Wales or nearby island streams. Clara Peratrovitch stated:

> ***"****T'a [king salmon] they only knew that it was captured in big rivers like Stikine River ... Naas River ... and any big rivers ... they, t'a would go through here ... and they would make trade with the people with grease, you know ... they had seaweed here that they didn't have…to get king salmon from them."* (CP TR: 26)

Klawock interviewee Theodore Roberts likewise observed:

> *"There were never king salmon in the rivers here. All we knew how to do was use herring as bait to catch them."* (TR TR: 48)

In reply to my question about whether or not he had ever seen king salmon in the Klawock River, Klawock's most famous Tlingit river fisherman replied that he had only seen them there once. He went on to state that it had occurred within the last two or three years and that he had seen a pair of king salmon swimming together in the river between the large fishing hole and the second falls. They were there at the time of the pink salmon run because, he recounted, as they moved through the masses of humpies, the smaller fish moved quickly out of the way of the king salmon as if they were frightened.

<u>Commentary on interviewee observations on king salmon</u>

It will be noted elsewhere in the report that the massing and catching of king salmon in Gulf of Alaska waters north of Cape Spencer was reported by Tlingit in the early 20th century. It seems more than likely that Tlingit inhabitants of the outer coastal area from Yakobi Island to Lituya Bay were familiar with king salmon passing through their waters. In fact, a well known Tlingit legend is about Raven using small birds to lure a king salmon to shore that Raven saw jumping in the ocean off the beach where he was walking (Emmons 1991). The legend is associated with the *T'akdeintaan* and I was informed by a *T'akdeintaan* clan leader that Raven's footsteps associated with this event can still be seen on a beach in the vicinity of Lituya Bay, an ancestral home of that clan. Representations of Raven and king salmon appear on certain blankets as *T'akdeintaan* house *at.oow* based on this event.

The earlier presence of king salmon in many of the streams of *Huna Káawu* is more difficult to assess. There are however some provocative pieces of information to consider. For example, Jefferson Moser, an early Bureau of Fisheries observer of southeast Alaskan salmon resources and fisheries visited the Dundas Bay cannery in its initial year of operation, 1900. Moser (1902) includes information about the types and amounts of salmon packed at the Dundas Bay cannery in 1900. Interestingly the pack included 60 cases of king salmon produced from 275 fish. For species other than king salmon, Moser provides a general location of harvest, especially for the sockeye. However, the king salmon are reported to have been taken "off Hooniah", a highly generalized location unlike the streams from which sockeye salmon were obtained. Perhaps of greatest relevance to the discussion here, Moser (1902:253) reports that the king salmon were packed in the period of September 1-30, that is the last salmon processed prior to the closure of the cannery. Had these been king salmon passing through early in the season and harvested by trolling methods, they would no doubt have been among the earliest salmon processed in June. However, the gear used to take salmon by the Dundas Bay fishing crews were gillnets and drag seines. Both of these were typically used in stream estuaries. The amount of king salmon processed, 275 fish, might have been taken from one or several streams. Taken together, the lateness of king salmon harvest and processing, the relatively modest numbers, their likely capture in estuaries, and the generalized provenience of the catch ("off Hooniah") point to the possibility of king salmon in small amounts appearing in a number of streams near Hoonah in September. This evidence certainly supports the observations of the Hoonah interviewees.

Icy Strait is the corridor through which king salmon in large numbers have historically migrated to reach the Chilkat and Taku Rivers to the east, rivers that are well known for their king salmon stocks. Given the occasional straying propensity characteristic of all salmon species, it is possible that salmon from these two rivers occasionally show up in Hoonah area streams. They may in fact have established small runs that later, due to their small size, disappear. This is another possibility to account for the interviewee observations about king salmon in Hoonah area streams.

DOG SALMON IN *HINYAA KWAAN*

At the northern end of Prince of Wales Island, geological research on the deep caves found in the karsitic geological formations of the area has demonstrated that there are a number of salmon stocks that apparently enter under water channels or rivers in Sumner Strait and migrate underground to spawning areas below ground. Klawock interviewee Byron Skinna described a similar circumstance on the west side of Warm Chuck Inlet, an embayment on the south side of Heceta Island. He described a dog salmon run the fish from which disappear underwater along the steep bluffs of the western shore where there is no observable stream. Oral tradition from *Hinyaa* sources indicates that the salmon spawn in an underwater cave location that extends to the opposite, Gulf of Alaska side of the island. The uplands of this portion of Heceta Island are also a karsitic formation, similar to the northern end of Prince of Wales Island.

<u>Differences in species between streams (size, color, timing, other characteristics)</u>

The most common difference that interviewees noted about differences between salmon of the same species found in different streams was their size. A general division was made between large and small size fish. This categorization was particularly noteworthy in characterizing sockeye salmon but also used in distinguishing dog, pink, coho salmon as well as between runs of a species in certain streams.

Concerning sockeye salmon, among Hoonah interviewees it was a common observation that the Neva River sockeyes in Excursion Inlet were small compared to other sockeyes. It was also a common observation that sockeye salmon from *Haaktaheen* on Yakobi Island, at present the primary source of sockeyes for most Tlingit residents of Hoonah, were "good" sized. Karl Greenwald was the sole interviewee to offer a tripartite division into large, normal, and small sockeye commenting as follows:

> *"Like the sockeye at Lake Neva. They're little guys. Very little. Then* Haaktaheen *[has] normal, big ones. You go to Surge Bay, nice big sockeyes, bigger still."* (KGd TR: 32)

For Hoonah interviewees familiar with the area between Point Augusta and Tenakee Inlet on the east side of Chichagof Island, a size distinction was apparent between the primary sources of sockeye in that area. Charles Jack makes the following observation comparing Freshwater Bay sockeye to Basket Bay sockeye:

> *"The ones from Basket Bay were bigger …bigger sockeyes. There were smaller sockeyes in Freshwater Bay. And they were harder to get in Freshwater Bay."* (CJ TR: 13)

Klawock interviewees made a consistent distinction between the size of Klawock River sockeyes, which were called large, and Sarkar (or Deweyville) sockeyes that were called small. For example, Theodore Roberts observed as follows:

> "*Deweyville sockeyes are small ... you go up there, you'll see, you stand at the bridge, you'll see them. They're small ... takes about 200 to get enough for the winter."* (TR TR: 56)

Few interviewees offered any reason for the size differences one observed in sockeye salmon. There was a slight implication that the size of the lake system might be related to the size of the sockeye produced.

For dog salmon, Hoonah interviewees emphasized the large size of individual fish in the fall run into the Excursion River and also the large size of the dog salmon in main river (Indian River) at the head of Tenakee Inlet. In the Excursion River case, the large size of the later fish distinguished them not only from dog salmon in other locations but also from the earlier dog salmon that came in the summer. Thomas Jack (TJ TR: 12) called the Tenakee Inlet dogs "big" and estimated that they averaged 18-20 pounds and that 25 pounders were not uncommon.

For coho salmon, observations about size were also made. Karl Greenwald observed that large coho caught trolling on Homeshore, outside of Excursion Inlet, were headed for the Chilkat River. This comment was made on other occasions informally by a number of Hoonah observers.

For pink salmon, Hoonah interviewees noted that Spassky Creek produced fish with the widest humps. This therefore made them desirable. In Excursion Inlet, the pink salmon from the stream emptying at Village Point were known as large humpies.

Color was another difference commented on by interviewees. Color refers to the external appearance of the fish or to the flesh of the fish. These color difference do not refer to the standard color change from red or pink to white flesh following movement from saltwater to freshwater. For interviewees, such color changes are to be expected as normal in all salmon. Species for which differences in color between individuals and stocks of that species were mentioned as a distinctive feature were king and dog salmon.

The characteristics of a distinctive coho stock are presented in the section on unique stock characteristics presented below.

Color in king salmon refers to the interior – the flesh of the fish. Two colors of king salmon flesh are recognized, red and white. This is true for both Hoonah and Klawock interviewees. Hoonah interviewees did not assert that any of the local stocks included king salmon with white flesh. However, Hoonah interviewees who had trolled in Glacier Bay commented on the frequent, if not abundant, appearance of white king salmon feeding in Glacier Bay which they would catch in the summer and fall.

Klawock interviewees were also aware of color differences and some made qualitative taste distinctions between red and white salmon. Joanna Woods observed:

> *"I know the fishermen valued the red because they got a higher price for it but I think the white is the best fish. I still think the white fish is the best fish there is, the white king."* (JW TR: 5)

Mrs. Wood went on to state that she believed that white king salmon was commonly preferred by the Tlingit people of Klawock. Interestingly, the market valuation of king salmon did not catch up to Tlingit preferences until the late 1980s when troll caught white king salmon finally surpassed red king salmon in price per pound.

Coloration expression in dog salmon pertains to external characteristics as opposed to internal characteristics. The two "colors" commonly referred to are dark and light. In the comment below, Thomas Mills refers to two different stocks or color phases of dog salmon that co-occur in the Excursion River in the fall:

> *"There's two types of dogs that was always [present]. When they're calico in the river, one of them is kind of a light tan and the other one just looks real dark. Lot of the old timers always preferred one of the dark ones when they were going to boil it up for fish."* (TM TR: 25)

Note that the coloration is also linked to an expressed taste preference for the darker dog salmon by Thomas Mills' elders.

One other distinct color form of dog salmon was described by several Hoonah interviewees. Thomas Jack (CJ TR: 12) describes dog salmon that enters the Indian River, the main river at the head of the Tenakee Inlet as a "blueback". The coloration is distinctive enough that when caught by purse seines either in the Inian Islands or at Homeshore, a substantial distance from their home in Tenakee Inlet, these fish are

identifiable by Hoonah Tlingit fishermen and their home stream recognized. Thomas Jack comments:

> *"[Up at the] head of Tenakee Inlet there's a blueback dog salmon they call it. We used to catch it out here at Point Adolphus, Indian Islands. And that fish would go out to Tenakee Inlet." (CJ TR: 23)*

Similarly, Karl Greenwald observes:

> *"Like if I made a set up at Homeshore, maybe get humpies or dogs. I know which dogs are going down to Tenakee. Big suckers, bluebacks."* (KGd TR: 32).

Other characteristics that distinguish salmon of the same species from one stream to another was their "fatness" (in reference to the girth of the fish) (CJ), "sliminess" (KGd), and degree of "boniness" (KGd).

Changes in species distribution

The major points about changes in species distribution among streams has been covered in the first discussion on stock distribution. In Hoonah, commentary on the disappearance of local runs of king salmon and certain sockeye runs was provided by a number of interviewees. In Klawock, as discussed below, several interviewees referred to the impact of the hatchery on changing the abundance of various species in the Klawock River.

Changes in abundance of species

Changes in abundance of species in certain locations has been addressed in a number of the interviewee commentary already presented. Comments appear to cluster around four themes: 1) reductions due to excess commercial harvest;

2) reductions due to excess subsistence use;

3) reductions due to stream degradation;

4) alterations in species composition and numbers due to hatcheries.

Reductions in salmon numbers in certain streams as a result of excess commercial harvests were commented upon by a number of interviewees. In Hoonah, sockeye salmon in the small outer coastal systems as well as Dundas Bay were recognized as having been reduced in numbers due to overexploitation during the first half of the 20th century. Karl Greenwald provides the following account about fishing practices in the outer coastal area when he was a young man in the 1940s:

> *"We were heading out to Spencer. Nice and quiet, nobody out there and foggy. And we knew how to run inside the rocks up there. Out there you see the rocks break, and we're running inside of them. And brother [Albert] said, got to be quiet, we're going to get up and get some sockeye. And I never knew it was a sockeye stream up there, but it was. So we were coming around this rock to get right in on the sockeye. And here was Old Jimmy Young in there in a set already. And he had all the sockeye tied up. We went out several times. That's only one stream; [there's] a lot of sockeye streams. We'd go up farther like up Astrolabe and even up Icy Point there's some big sockeye."* (KGd TR: 20-21)

Concern over the decline of sockeye salmon in the outer coastal region was expressed as early 1929. During the Alaska Native Brotherhood annual convention that year Hoonah *T'akdeintaan* leader requested that a resolution be passed calling for the closure of commercial fishing in Dundas Bay due to the decline in the sockeye salmon in that traditionally owned *T'akdeintaan* stream (Dauenhauer and Dauenhauer 1994: 727)

According to Hoonah interviewees, local king salmon stocks had been severely reduced and mostly eliminated in the first half of the 20th century. Concerning the present lack of king salmon in these streams, Thomas Jack makes the following argument:

> *"…they were fished out during the days, in the olden days [when] skiff fishermen were tow[ed] around by tender."* (TJ TR: 9)

Thus the reduction and eventual disappearance of king salmon stocks in smaller systems is thought to have occurred in the first half of the century as a result of commercial fishing. It is also asserted that this was the result of targeting at the river mouths and not associated with trap or purse seine interception fisheries at a distance.

The only stream specifically mentioned as experiencing reduced runs due to excessive subsistence use was Garteeni Creek. Charles Jack observed:

> *"It has everything but the main one that goes up there is coho. That's why they call it Gaat Héeni. … It's been used so much now, it doesn't get the amount of cohoes it used to get. 'Cause it's so close you know. It's not too far to go get coho from there."* (CJ TR: 33)

Mr. Jack's comment reveals several contemporary conditions that demonstrate the decisive change in the relationship of *Huna* to salmon in the last 60-70 years. The population rather than being dispersed during the arrival of cohos is concentrated at the village of Hoonah. The population increase, both Native and non-Native, has resulted in

high levels of capture of coho from the stream. There is no clan trustee or recognized clan ownership to directly or indirectly limit harvest from the stream.

Habitat degradation by human activity is also recognized as a cause in the reduction of salmon runs in certain streams. The most salient example offered by several interviewees was nearby Spassky Creek where logging on Huna Totem Corporation lands had been carried out in the past 15 years. Reductions in the number of humpies and cohos returning to the stream were noted as a result of these logging practices. The changes in the stream characteristics seen as detrimental to salmon reproduction are discussed below.

Manipulation and alteration of salmon species composition in streams and rivers by the actions of hatcheries was a major concern of Klawock interviewees. While the Klawock River was one of the earliest to have a hatchery placed on it at the beginning of the 20th century, concerns expressed addressed the current hatchery on the river which has been in operation for about 20 year. Theodore Roberts that the recent activities of the hatchery have seriously impacted the sockeye salmon. He notes that an initially they built up dog salmon when the market prices were high for commercial seiners to benefit from the surplus. Now, however, they are "trying to turn it into a coho stream – it is supposed to be a sockeye stream." (TR PC). Other Klawock interviewees also expressed concerns about the impact that the hatchery stocks have on the natural stocks of the Klawock River.

Hoonah interviewees expressed concerns that hatchery and farmed fish would displace the natural stocks of salmon in the streams. They believed that this would cause a reduction in the overall strength and resilience of the natural runs and lead to serious problems.

Changes in timing of runs

Interviewees were aware that the timing of the arrival of different runs of salmon varied from year to year as did the temporal period during which a specific run might. Thus fish might come in slowly in little spurts or rapidly in one to two big bursts. Despite this understanding about variability in patterning and timing of salmon runs, there was a strong agreement among interviewees in both Hoonah and Klawock that sockeye salmon runs were now arriving later than they had when the interviewees were young.

In Klawock, Theodore and Alicia Roberts recalled the arrival of sockeye in mid-May when they were children. Concerning that run, Mr. Roberts states:

> *"The sockeyes …they start showing up [early]. We used to get sockeyes from up the mouth of the creek right from May. There was two runs - early run and late run. There's no more early run, not around here."* (TR TR: 50)

Mr. Roberts' remarks suggest that the lateness of sockeye appearance now is the result of the disappearance of the early May run. What has caused the disappearance of the first run was not noted.

Albert Woods, son of Joanna Woods of Klawock, recalled that as a boy in the 1950s, the family had traveled over from Ketchikan in early June to put up sockeyes and "we're always done by the end of June." (JW TR: 12)

In Hoonah, similar observations about sockeye run timing were made by several interviewees. James Osborne stated that when he began gaffing fish as *Haaktaheen* as a boy that they would arrive in early to mid-May to find sockeye already in the streams at various sites on the outside of Yakobi Island. At the Neva River, Thomas Mills remembers that as a child they would get "antsy" in early June for the sockeyes to arrive – "Before it used to be the second week of June" (TM TR: 9).

None of the Hoonah interviewees offered a distinction between different runs of sockeyes into the same stream so therefore the shift in timing of appearance was not attributed to the disappearance of an "early" run.

One other change in possible change in the timing of runs was offered by Karl Greenwald concerning the fall run of dog salmon to the Excursion River. Mr. Greenwald Observed:

> *"The season never opened 'til October on the fall fishing. And now right, it's… the end of August or September when they open. I think it's the pull of the cannery. They want to close up. They want to keep their crew. Before they used to close up back when. And the tenders used to come up and get them, out of Seattle. And we got a bigger price. But this way here, they stay up and make money. So they put the pressure on Fish and Wildlife or Fish and Game, whatever and…got it to open earlier."* (KGd TR: 50)

Mr. Greenwald does not attribute the earlier fishing time to a change in the timing of the run in this quotation.

Physical anomalies

The vast majority of salmon observed or harvested display a standard set of characteristics, externally and internally, with a range of recognized variation considered "normal" by Tlingit interviewees. What constitutes exceptional and noteworthy observable difference, that is outside the normal range of variation, can vary among persons but apparently Tlingit interviewees utilized a similar model for salmon standard form and variation. That "standard" model apparently developed by observing and participating in harvesting and processing activities as children with their relatives as well as by receiving direct instruction.

Exploration of this issue with interviewees was conducted through use of the question "What were you taught about unusual looking salmon?" While size and color ranges were widely acceptable as variations on a basic pattern, changes to certain features were regarded as anomalous and the criteria for determining what was anomalous was quite broad as indicated by the following:

> *"The only thing we were told to look for was something, anything abnormal. Anything that was abnormal, they would tell us to discard that fish as a result of the abnormality."* (TM TR:47)

Abnormality was therefore broadly conceived as a decision-model and not tied to discrete criteria but when identified was viewed as cause for eliminating the fish from human use.

Among Hoonah interviewees, the only remark concerning possible specific anomalies was given by Thomas Jack as follows:

> *"…white spots on them, they're okay ... they're still edible. In fact for what they call boiled fish…that's when you usually get 'em; just right after they've spawned out."* (TJ TR:41)

Charles Jack provided the term *wudzixen* (white) for this state:

> "Wudzixen *means its getting white on it. It's getting old. Yeah, the humpies, the dogs. They all have it."* (CJ TR:18)

A clear and stark distinction can be found between the Klawock interviewees and the Hoonah interviewees on the question of anomalies and abnormalities. There were no explicit, recurring anomalies identified by the Hoonah interviewees while Klawock

interviewees presented both a single, central recurring description of an anomaly and also described several different anomalies.

KLAWOCK: RECURRENT ANOMALY

Klawock interviewees offered a quite uniform description of the characteristic they were taught to look for as an unacceptable anomaly. The anomaly was on the inside of the salmon. For example,

> "*If there was white spots in the fish. Sometimes you get fish and they have white spots in them; then we didn't use that fish. We still don't. …When you look in it you will see white spots in the flesh. It can be in any salmon. We always threw that away."* (JW TR:25)

Another description of the "white spots" comes from Theodore Roberts:

> *"When you see, especially in the humpies, they're so white… just white…little balls right on the backbones…soon as you break the head…then you cut it open if it's got that on it just throw it away. It's not a healthy fish. King salmon has that too but not dogs or sockeyes. They don't eat kings that have that…it's called diseased."* (TR TR: 34-35)

Clara Peratrovitch commented as follows on this condition:

> *"The only time they won't eat humpies is when it has those white eggs inside the tail, in the meat part. They don't eat that part, they leave it so that the seagulls will feed on it. It's not good for humans. They never, never bothered with it if its got those white eggs - then you can't eat it. But I don't know why; it's the only salmon that gets those white eggs in there – humpies."* (CP TR: 7)

Ron Williams agrees concerning the "white spots" designation of anomaly, but places their occurrence in another part of the anatomy:

> "*…there'd be spots on the humpies. You'd open up[the] mouth and see spots …like pimples…and they'd discard it, wasn't any good."* (RW TR:24)

The mouth location and "pimple" form of the white spots described by Mr. Williams may indicate an anomaly distinct from the white spots in the flesh described by the other interviewees.

The Klawock interviewees have different views concerning which species of salmon the "white spots" are found upon. All agree that they are found on humpies predominantly however Mr. Roberts believes that they also are found in king salmon, but not other species and Mrs. Woods believes that they could be found in any salmon.

Mrs. Peratrovitch refers to the white things as "eggs" indicating her belief that they were some other life form. Mr. Williams' describes them as appearing in the mouths of pink salmon.

Byron Skinna, a lifetime commercial purse seine fisherman, by contrast, offers a different perspective on physical anomalies to salmon.

> "*SL: In what ways might a fish look unhealthy?*
> *BS: Usually on the outside, there's some kind of growth on it…some times you see little bulgy things, like tumors. You just throw them away…The other day, Vaughan [his son] called me and …said…"Hey, dad, there's fish on my boat, But the eyes are bulging out…they're bulging out of the sockets…what's wrong with them?" I told him they're sick, probably the oil spill has a lot to do with it or…the hatcheries might have something to do with it. One or the other or maybe both. I don't know but those fish are sick."* (BS TR: 46)

When asked how frequently he had observed anomalous conditions in salmon such as these, Mr. Skinna replied: "Not very often, just once in a great while." (BS TR: 46).

Interviewee Offered Observations on Salmon Variability

In this section, dimensions of salmon variability and changes to habitat, specifically stream characteristics, offered independently by interviewees are presented.

Unusual run timing. The normal model of timing of salmon entry into streams for spawning recognized by interviewees varies for each species but May to October represents the basic expectation for virtually all salmon. A notable departure from this is the recognition of late runs of coho salmon into certain streams that may continue into November and December. Evidence supporting these assertions by interviewees are not merely the presence of coho in streams "under the ice" (TJ TR: 24) but that the coho were bright, indicating fresh arrival, as opposed to dark or red indicating a substantial period of presence in the stream. Appearances after October in streams species other than coho would certainly be regarded as unusual. Appearances earlier than May would be regarded as unusual as well.

Unusual run timing on both the early side and the late side were reported for sockeye salmon. These observations were reported by interviewees for Port Frederick streams in the vicinity of Neka Bay, perhaps the Neka River per se. As noted in the discussion of unrecognized stocks above, Thomas Jack reported an early April appearance of sockeye salmon in the Neka River. Karl Greenwald reported a late

appearing sockeye run in a lake nearby that was timed to a creek which only had enough water when September rains appeared.

A winter run of king salmon was also said to occur in the Tenakee Inlet region however no specific stream location for this appearance was provided (TJ TR: 14).

Unusual physical appearance of stocks. Previously discussed were patterns of variability in the physical appearance of stocks that were perceived to be normal and physical anomalies that were perceived to be abnormal. In addition, one stock description marks it as distinctive and in fact unique in the eyes of the interviewee. Karl Greenwald provides the following description of this unique salmon:

> *"And there's also one species of a coho that's snow white. The stomach, the flesh. The flesh is white. Even the eggs is white. And they only place they spawn is up there at the Chilkat River. They're Chilkat fish. There's not a great abundance but in the fall time; you'll catching them trolling."* (KGd TR: 46)

This would appear to be either a variant phase of coho or a distinct stock but it is not possible to tell from this information which of these it might be.

Unique stock characteristics. While the total white coloration of the supposed Chilkat River coho stock described above is certainly unique, Thomas Jack provides the following observation about "blueback" dog salmon from Tenakee Inlet:

> *"That's a two-year dog salmon, they go up the creek, spawn out, come back out. [They] go back out to the ocean and then come back the second year and then die."* (TJ TR: 21)

According to Mr. Jack, this dog salmon stock uniquely 1) initially returns after two years, 2) spawns and then returns to the ocean, and 3) returns another two years later when it spawns and dies.

Stream Characteristics. Several different kinds of changes to stream characteristics were noted by interviewees. Changes related to geological phenomena were noted for several streams. In Hoonah interviewees commented on the occurrence of earth slides as causing the disappearance of certain streams. One of these cases was a stream in Excursion Inlet presently known to Hoonah Tlingit as Duncan's Camp. It is recalled that a slide in this area in the first half of the 20th century blocked the passage of

salmon upstream for a period of time. Later, the stream re-established itself. Further discussion of this stream occurs later in the report under the topic of stream stocking.

A slide is likewise described as having destroyed salmon access to streams in Tenakee Inlet as well. Of this circumstance, Charles Jack states:

> *"Sockeyes used to go up there. What happened…that [main river at head of Tenakee Inlet] was also a sockeye stream, too. There was a big slide and it blocked the area. My dad was a child when that happened. He tried to tell the Fish and Game to clear out that slide so the sockeyes can go or put a ladder there. Same thing with the little creek in Corner Bay. That was a sockeye stream, too."* (CJ TR: 31)

Mr. Jack states that the stream at Corner Bay in Tenakee Inlet was formerly a sockeye system, but he does not clearly indicate whether or not a slide was responsible for the disappearance of sockeyes from this stream but such an inference seems reasonable.

Another geological phenomenon recognized by Hoonah interviewees is tectonic uplift. This is well recognized in Graves Harbor (outer coast), Taylor Bay (Cross Sound),

Figure 1 Garteeni Creek near Hoonah with stream characteristics preferred by Tlingit interviewees consisting of tall trees by the stream providing shade to keep water temperatures down with overhanging bushes and branches creating habitat for salmon protection.

Dundas Bay (Icy Strait), Adams Inlet (Glacier Bay), Beardslee Islands (Glacier Bay) and Icy Passage – Gustavus Flats (Icy Strait). No mention, however, was made of the impact of uplift on stream characteristics or any resulting changes in salmonid distribution.

Human impacts on stream characteristics arising from various activities were also noted by several interviewees. In Hoonah, Thomas Jack observed that logging down to the edge of the stream had disastrous impacts on Spassky Creek, greatly reducing its productivity of dogs and pinks. Crucial changes resulting from logging included the lack of shade, increased temperatures, increased stream velocity and significant siltation due to erosion. It was noted that the problems occurring in Spassky Creek resulting from destructive logging techniques were not being experienced in Garteeni Creek where a protective buffer of trees had been left in place (see contrasting photos above and below).

Figure 2 Spassky Creek near Hoonah where mature trees at stream side were logged off reducing shade causing water temperatures to rise and eliminating cool resting areas for salmon. Excessive siltation from logging in the background is also evident in the photo.

Another category of human impact regarded as detrimental to salmon is the establishment of weirs associated with hatcheries and assessment. In Klawock, Theodore Roberts and Clara Peratrovitch both raised objections to the fact that weirs in place now blocked the upstream movement of salmon. Mrs. Peratrovitch was especially concerned about the impact of the weir by the hatchery on sockeye salmon movement up to the lake and their ultimate spawning streams (CP TR01). Mr. Roberts observed:

> *"Now, they got the weir got blocked off, no coho goes up there, no sockeyes, they're selling all the eggs."* (TR TR: 24)

Mr. Roberts and Mrs. Peratrovitch are the conveyors of a deep heritage among the *Hinyaa* of not obstructing the path of those salmon wishing to reach their spawning grounds. Later in the report, the practices of tidal pulse fishing practiced by the *Hinyaa* that date back perhaps 1500 years will be presented and discussed. In more recent times, Mr. Roberts recounts how in the late 1930s, *Gaanax adi* clan leader John Darrow destroyed an early Bureau of Fisheries weir in the Klawock River erected immediately above the tidal falls to count the salmon. Of that event, Mr. Roberts recounts:

> *"He[John Darrow] asked them [federal weir watchmen], what you doing? He told them, this is* ***my*** *creek! [John Darrow asserted his traditional authority as* Gaanaxadi *clan leader]. He showed them the sockeye. Picked up one that's, there was no more nose there, trying to get past that weir. But then he showed them that, below the falls, all the dead sockeyes. This is my river! You're destroying the salmon, the sockeye. He couldn't stop them, he just chopped up the whole thing [weir]... it drifted down the creek."* (TR TR: 80).

On the Neva River, Thomas Mills objected to the manner in which the stock assessment weir used to count the number of returning salmon was being tended. He observed that it was unnecessary and unfortunate that sockeyes and cohos were often delayed up to several days at the weir before they were released to go upstream.

B. Harvesting Practices

Tlingit interviewees' comments demonstrate that salmon were taken for human consumption in all saltwater and freshwater contexts where they occur and at various life stages from early adulthood (king salmon) through post-spawning (sockeyes and cohos). A variety of techniques were developed and used to acquire salmon in these different locations and life stages. The techniques were accompanied by a set of guidelines for use and moral prescriptions about the manner in which salmon taken were to be treated and used. Following harvest, numerous processing techniques were used to transform salmon into food and other items used by Tlingit people.

The contexts in which salmon were taken cover the entire continuum of salmon presence from the spawning stream to the ocean. However, Tlingits did not travel far offshore into the Gulf of Alaska to pursue salmon when they were feeding and maturing. Instead they waited until the salmon had begun their long journey to their homes. The continuum in the *Huna* region of capturing salmon extended from the ocean to the lake tributary where spawned out fish could be taken. A schematic representation of the region and the contexts in which harvests occur is presented on the next page.

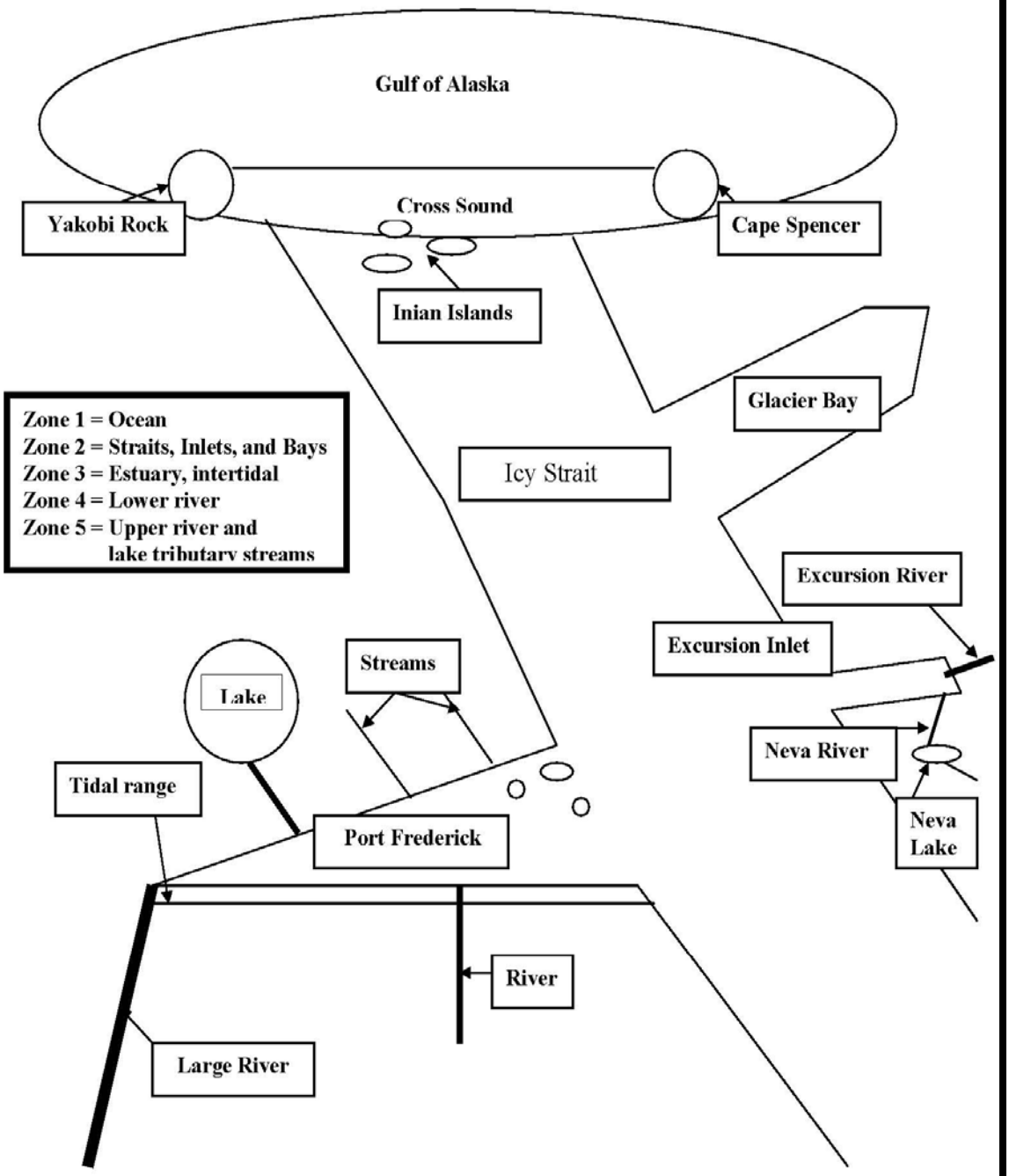
Palates and Preferences

The traditional Tlingit palate was able to make fine distinctions about the taste of salmon. Individuals differed in their preferences for certain flavors and desires for certain flavors might occur at different times. These differences arose from both the qualities of the species, the stream from which were obtained, the location (or zone as indicated on the zone figure) in the stream from which the salmon were taken (a proxy indicator of the life stage) and perhaps even differing stocks of the same species within a stream. Karl Greenwald made the following comment about how elders' preferences related to the differences between dog salmon taken from different streams near Hoonah:

> *"And like* Gartheen*i here. The dog salmon they [elders] didn't like cause the fish is tougher. You know when you dried it. It got hard or brittle. So they didn't like the dog salmon from* Gartheeni *but they did like Spassky, Neka Bay or Humpback Creek."* (KGd TR: 10)

Thomas Mills recalls how he was given special instructions on where to obtain fish from by his elders and describes elders' abilities to distinguish harvest location by the taste of the fish in the following:

Figure 3 Schematic of Traditional Salmon Harvesting Locations reported by Hoonah Interviewees



> *"Grandmother always just told us when she wanted a fish and from where. That's what father always asked for when he was getting older; that's what he wanted was a dark, dark dog salmon or he wanted a coho that was swimming but barely alive. That always gave just different flavors on it. It wasn't how edible the carcass was when we brought the fish in at the end of the season, it was the flavor that was always wanted. You could always tell by the fish that you're eating or pretty much tell by the fish you're eating if it was caught in salt water or at the mouth of the river or up the small creek or up in our lake. You can distinguish it right away. I know the old timers can really tell the difference. That's why they wait some of the years to see, they wait a little bit longer and wait for the fish like before we would get some fish out of the big creek, some sockeye, then we'd go in to the small creek, then we'd go into the lake, then we'd go into the creeks up at the lake.* (TM TR: 15)

In this discussion, Mr. Mills makes distinctions between 1) two types of dog salmon, as distinguished by their in stream coloration, 2) life stage, and 3) four different locations of harvest that are associated with separate tastes. In addition, his remarks reveal that strategies for where harvests would be focused might vary from year to year depending on factors such as taste preferences and characteristics of the salmon when they enter the streams.

Similarly, a wide range of taste preferences relating to salmon were expressed by interviewees in Klawock. Spawned out salmon were one of the taste preferences in Klawock as well. Joanna Woods remarks:

> *"Then in October, I think it was October or November, they go up and get the red sockeye, you know...they were red and that is delicious fish. They have to go up to the lake to get those. They have a completely different taste. I remember they would, you know, the old folks would ask for it and then the men would go up and get it."* (JW TR: 12)

An enormous range of variability can be found in the preferences demonstrated for various kinds of salmon and these in turn may vary between individuals and from year to year. A flexible suite of harvesting technologies was needed to be able to acquire salmon that best fit the range of taste preferences that might were likely to arise. The following discussion divides Tlingit harvesting into three based on the combination of location, quantity of harvest, and technology.

The salt water environments of bays, inlets and ocean away from the streams produced the fewest number of salmon. It is not clear that all Tlingit caught salmon in the salt water environment but certainly some did. The estuary and lower stream

environment is where the majority of salmon harvesting took place and the technologies designed for these locations reflect the focus on mass harvesting. Finally, there were also in stream technologies that were aimed at taking salmon that had already ascended into the stream. For certain species such as sockeye and coho salmon, the in stream technologies might be utilized in the upper portions of the stream in the late fall or winter when a few salmon might still be lingering after spawning.

Saltwater harvesting

Interviewees in both Hoonah and Klawock were familiar with the routes by which salmon migrated from their homes under the water in the ocean to the streams where they spawned. Tlingit interviewees recognized that for most of their inshore travels, salmon follow the shorelines and pass near points that protrude into channels. In Hoonah, the pathway led from entrance in Cross Sound, down North, South or Middle Passage of the Inian Islands, then continuing down Icy Strait in route to their final destinies in streams at the heads of bays far distant from the ocean. Traditional *Huna* accounts, as provided by Sam Hanlon for example, refer to the Inian Islands area as *Ix ay* and it is spoken of as a gathering point where arriving salmon stopped to discuss with each other their travels and indicate their final destinations (SH TR:12). Charles Jack observes:

> "*All these fish, they meet in Cross Sound and they ask each other where they're gonna go. Then they name off the rivers they're gonna go to, one another. Humpies though…humpies don't have a home. All the other fish has homes."* (CJ TR: 28)

Thus while sockeye, cohos, dogs, and kings are explicit about the streams to which they are heading, pinks say that they have no specific destination but rather will go to any stream that is available. Charles Jack comments:

> "*Humpies say,* 'Ch'a daakw aa x̲'as x̲'e heeni de aya xaat'. *(Any creek that's running, that's where I'm going.) That's just a short version."* (CJ TR: 28)

The mythic formulation more than likely refers to the Tlingit perception of relative ubiquity of pink salmon rather than the statement that implies that pink salmon were not returning systematically to their streams of origin. James Osborne makes it clear that the belief was that all salmon returned to their home streams in the following observation:

> *"The fish that went to Eagle River across there, they never come over here to spawn. Each one of them knew where their home was. The fish that comes out of*

> *there, fingerlings, you see them. Where they go to out in the ocean, we don't know.* (JO TR: 6)

Some interviewees also had ideas about how adult salmon were able to return to the streams that they left. Thomas Jack observed:

> *"You can smell each creek has its own, own distinctive smell ... like they can smell so they know which way to go. So that's how they found out because they'd never seen the land with that smells put into them when they're small and when they come out. That's what they look for when they're coming back in the fall ... they follow that scent and it goes out of the streams and they can follow it.* (TJ TR: 29-30)

In Klawock, by contrast to the single entry point of salmon from the ocean down Icy Strait, various pathways are recognized by which salmon enter the *Hinyaa* area (BS TR, TR TR). Salmon headed for the Klawock River are thought to come up Bucareli Bay, follow a northwest course along the shore of Baker Island, up to Fern Point where they turn east and cross San Alberto Bay, traveling past Klawock Reef into Klawock Inlet. Once they have reached Klawock Inlet, virtually all travel north around Klawock Island and then south into Klawock Lagoon where they prepare to ascend the Klawock River. Salmon headed for streams to the north of the Klawock River but east of the Rosary Islands enter from the ocean down Arriaga Passage, cross San Christoval Channel on the north side of San Fernando Island and through the Rosary Islands. Salmon headed for Shinaku, Big Salt Lake streams, Little Salt Lake streams pass Ildefonso Island and travel around the north end of Wadleigh Island to their final destinations. A few of these salmon may also come up Klawock Inlet and continue north past Klawock Island to reach their homes.

Salmon headed for areas north of the St. Phillips Island are thought to enter down Bocas da Finas, a channel than passes from the ocean to inside waters down the southwest side of Heceta Island. Fish headed to streams further north on the west side of Prince of Wales Island such as Karheen, Sarkar, Naukati, and Tokeen enter through into Sea Otter Sound and then travel through various routes to their homes. At the far north end of Prince of Wales Island, El Capitan Passage that separates Prince of Wales Island from Kosciusko Island is recognized as the corridor through which salmon headed to streams in the Devilfish Bay area and other streams that empty into El Capitan Passage enter inside waters.

Tlingit interviewees described a variety of different behaviors of adult salmon in saltwater environments. For example, king salmon are recognized to exhibit a special pattern in that adults, typically of an immature age, can be found feeding in various locations, but usually in shallow areas associated with kelp beds, at any time of the year. Herring and other small fish are the food they are after. Their availability in winter is well recognized and therefore they can be harvested at that time of year. The four other species of salmon typically appear in adult size in the inter island saltwater areas when they are on their return migration to their spawning grounds.

One important characteristic many Tlingit interviewees in both Hoonah and Klawock noted is that salmon species differ in their propensity for feeding in the saltwater environment. King salmon and coho salmon are known to be feeding when in saltwater, while pink salmon, although not necessarily feeding, will bite on hooks offered them. Dogs and sockeyes, by contrast do not feed and rarely bite on hooks in the saltwater environment. Thomas Jack comments:

> "*…sockeye in the ocean is timid, so is the dogs in the ocean…they're timid fish because they have no teeth whereas the cohos, king salmon got teeth all the time, and the humpies…that's why they feed so much in the ocean but the dogs and sockeyes are timid fish…out in the ocean."* (TJ TR: 46)

This pattern was recognized traditionally by both *Huna* and *Hinyaa* people both of whom designed and utilized methods for capturing king and coho salmon in saltwater contexts. In both areas, techniques involving canoes dragging hooks at the end of lines with either herring or lures in salt water locations where kings were known to be feeding were described. When the salmon took the hook, the fish was played and then landed.

This technique is now referred to as trolling. It should be noted that Northwest Coast Indians are considered the originators of the salmon trolling industry with the Tlingit and Haida being recognized as having developed the technical means and knowledge upon which the industry in southeast Alaska became based. Damron (1975: 18) in his study of the origins of commercial trolling in the Pacific Northwest writes the following about original trolling in southeast Alaska:

> "A small part of the annual catch was contributed by Indians who trolled the offshore waters, rowing their canoes to offshore reefs and using hand lines to tow baited hooks. These natives knew that chinook [kings] schooled up to feed offshore…In 1905 in Alaska, for example, there was an offshore troll fishery

> for salmon fished by Indians using rowboats and canoes. This was probably the first commercial troll fishery on the Pacific Coast."

Perhaps the first recorded observation of this practice was in 1868 when Emil Teichmann described witnessing "lines trailing behind canoes" as he traveled down Peril Strait toward Sitka (Teichmann 1963).

Only a few of the interviewees were able to recall traditional, pre-commercial forms of trolling. Gordon James (GJ TP) described a technique that he observed as a youth in Kake whereby a V-shaped short wooden hook was inserted through the mouth of the herring and then tied to a line. The line was then dragged behind a slowly moving canoe as it traveled parallel to the shore where the kings were located. Both the herring and its movement would attract the kings to bite the fish and be caught by the hook. The description corresponds closely to the gear in Emmons (1991:114).

Jim Martinez describes his earliest experience at trolling when he was about the age of six, using a metal hook ("spoon"), of this kind of fishing as follows:

> "*I used to row around and one day I was out at the scow ... and all the trollers were there and I found a spoon hook, I went home and ... got a rope, a line and tied it up to that spoon and I went back out and I threw it over the side... I was rowing and I remember singing ....but pretty soon, I couldn't row anymore, I couldn't figure out what ... what's you know ... and I looked behind and I seen that fish jump ... I thought, boy, I see a fish jump ... you know. And I was yellin' hey, fish jump, you know. And I looked at my line, it was straight down, I couldn't figure out why, I grabbed, started pulling it, I thought it was snagged up, but it pulled away from me, you know. I couldn't figure what's goin' on ... I started pulling it, I got it up close and it was big king salmon. And I started hollering Martinez [his stepfather] came out of the scow and he asked me what's the matter? And I told him, I got a fish. Well, he said, pull it in! I couldn't pull it in, because it was so big. And, he said, tie it up and row it towards me. So I tied it up and around the seat and I started rowing toward him, pulling hard as I can and I got it there and he landed. He cleaned it and gave me a quarter*." (JM TR: 25-26)

Metal hooks came into common usage in the early part of the 20th century and nearly displaced traditional materials after the take-off of the commercial trolling industry around 1910-15. The older techniques, however, persisted in a few families for many years afterward practiced by long-lived elders primarily who in turn passed the techniques along to grandchildren that they raised.

Another technique for taking king salmon is described by Thomas and Charles Jack who spent most of their childhood in Tenakee where they were raised under the tutelage of their grandparents. The gear consists of cedar float carved in the approximate shape of a bird with a round knob where the head would be at the end of the neck portion. The leader, for which caribou line is preferred, is tied to the neck just below the knob end and wrapped around. The leader can be of various lengths depending on the depth at which the fisherman wishes to have it. A weight, usually a rock, is tied onto the leader a short distance from the hook to insure that the hook will remain under water. The hook is a carved in a closed J form. The hook that may or may not have eggs attached. Between the hook and the weight a "propeller" lure is placed that will spin when water moves past it. At the rear of the carved float, a flat trapezoidal piece of wood (see sketch) that has the appearance of a tail is inserted at an angle. The entire rig is anchored via a line attached. The gear can be used "anywhere there's a little bit of tide so the propeller" will spin. Thus this technique combines sight, smell and sound elements in attracting the king salmon to take the hook.

In commenting on the deployment of this gear, Thomas Jack remarks:

> "*In the olden days, the guys that had more of these were the big fishermen. Some would have up to 50 or 60, a lot of these things; they'd just go back and forth in the canoe and watch it."* (TJ TR: 33)

This technique is similar but more elaborate than the gear presented and discussed by George Emmons (1991: 114) about which he learned from Angoon Tlingit. According to Emmons, the Angoon Tlingit used to anchor their versions of this gear type in the strong tidal waters of the narrow channel above the village that led toward Mitchell Bay. The Jacks are both *Wooshekeetaan* whose mother and grandfather had ties to the Angoon *Wooshekeetaan.* Thus this gear type is likely to have been shared by Angoon and Tenakee Tlingit. Thomas Jack indicates that they were in widespread use previously:

> *"We used to have [them] al over, in all the Natives' canoes. That was even before the white man come around, that's when they fished like that."* (TJ TR: 35)

The king salmon gear described and its operation is depicted in the sketch. Conceivably this king salmon gear could have been used in traditional times by the outer coast *T'akdeintaan* whose primary territory extended from the west coast of Yakobi

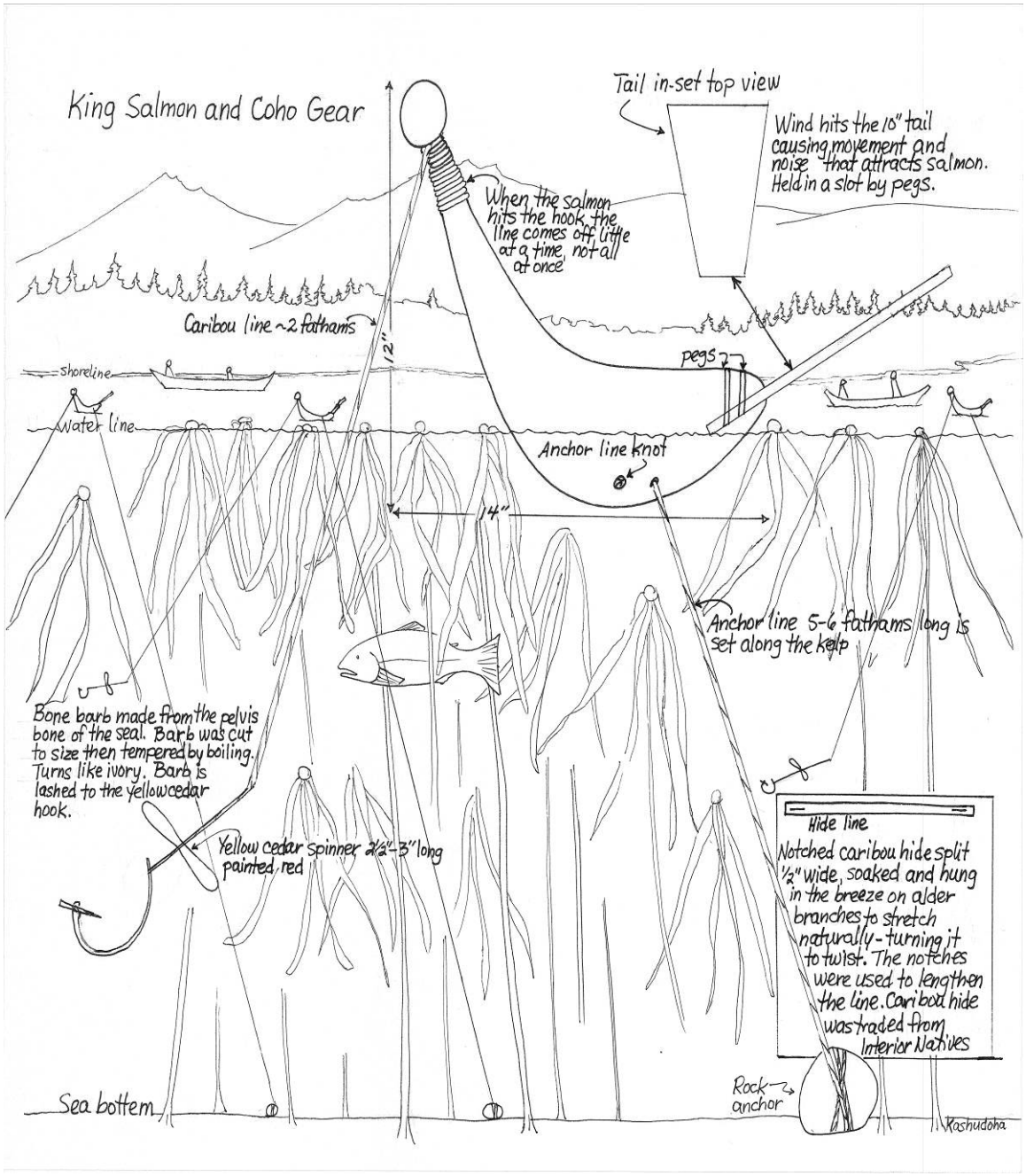


Figure 4 Floating salt water king salmon gear used in shallow waters where king salmon are known to be feeding, primarily on herring. Copyright by Thomas Jack 2004. Sketch by Wanda Culp

Island all the way north past Cape Spencer to just above Lityua Bay (Thornton 1998). While none of the Hoonah interviewees referred to traditional king salmon harvesting in these waters, *T'akdeintaan* were quite aware of the massing of large stocks of fish in the ocean waters of the outer coast. Kendall Jackson, a *Huna T'akdeintaan*, made the following statement in 1946:

> "The *T'akdeintaan* owned from Icy Point northward. East of the point, inside the bay, was a place called *Gaana xaa.* I used to purse seine and hand troll there. The last time was in 1919, when I caught **six hundred king salmon** there." (Goldschmidt and Haas 1998: 136)

Taking of coho in salt water is also described by the Jack brothers. Modified versions of the technique described above with smaller hooks could also be used to take cohos as they were feeding on their homeward migration.

Another form of salt water harvesting of coho was described by Charles Jack. This technique involves the use of cylindrical shafts of cedar, typically, to which are attached at one end a leader with a similar J hook to the one used on the king salmon gear. The gear is carved with an image associated with clan crest or other personal indicator. It is a form of property mark that can easily be identified when a number of fishermen have put out their fishing sticks in an area. Salmon eggs are attached to the composite hook. The design is similar in construction to the description in Emmons (1991: 116). Small slivers of cedar were inserted in the eggs so that the hook portion would rotate to the top giving the fish less indication of gear. When the fish takes the hook, the pull on the leader will cause the stick to stand up in the water and the carved portion will become visible to the watching fisherman. The fisherman will then track down the hook and capture the fish. The sticks are normally placed in areas, such as headlands outside bays, where cohos are known to congregate prior on their movement. A fishermen will likely numerous sticks fishing in an area so must be vigilant in order to catch the cohos. The sketch shows the gear and provides additional information on how it was used.

Charles Jack offers the following description of the operation of this technology:

> *"And everybody had what we'd call a buoy. Stick about this long, about that big around. About thirty inches. It would be red cedar. And it had different color design on everybody's…everybody knew whose color design it was. They put the hook on this end, depend upon how deep you want to fish. You throw it in the*

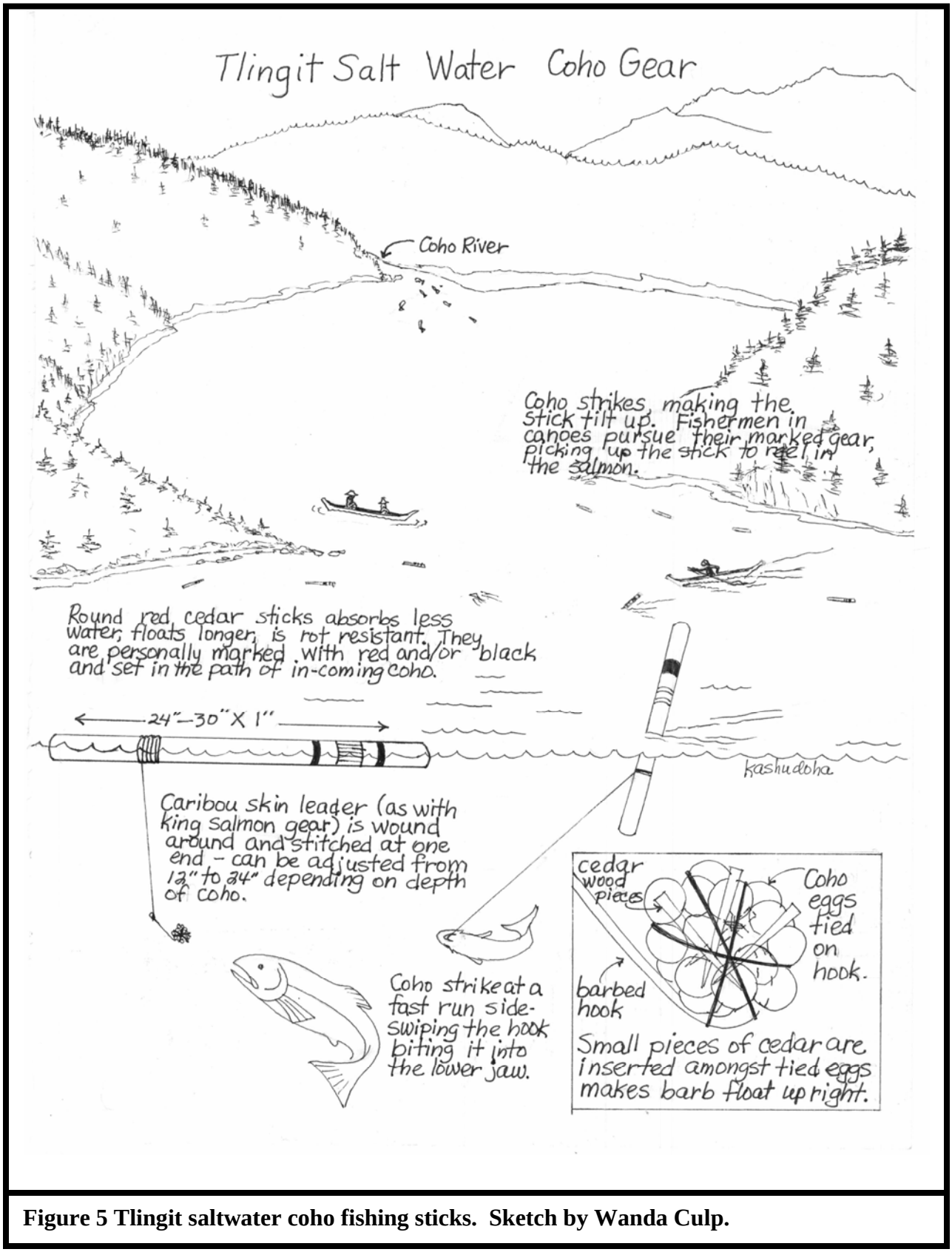


Figure 5 Tlingit saltwater coho fishing sticks. Sketch by Wanda Culp.

water where the tide is running. You watch it. The place they used to do it most is in Danger Point in Angoon. Out on Danger Point there's a little cove here. They'd drop it over here on this cove and they'd drift around in circle, sometimes drift out. And they all watch it with their canoes. So when the stick stands up like that, means they caught a fish. They'd had a look like this [demonstrates with hand – nearly closed circle formed by thumb and first finger]. And the hook would hang down then…on the end there….when the fish hit it…They know your color and they say, 'Hey, you got a fish'." (CJ TR: 25-26)

In Klawock, a similar but less elaborated idea about floating sticks for cohos was vaguely recalled. One important difference was the observation in Klawock that line was wrapped around the stick so that it would the stick would gradually spin and release more line if the coho tugged on it. The unraveling of line wrapped around the body corresponds to Emmons (1991:114) sketch and description of the stationary Angoon king salmon gear.

Estuarine and lower stream harvesting

As the salmon moved from the ocean to the straits and bays, Tlingit observed their annual return to the areas near the streams. The estuary zone where the salt water and the freshwater come together was perceived as extremely important area where salmon prepared themselves to travel up the streams. Tlingit observed differential patterns of species as they schooled, jumped, ascended and descended in their preparations for moving toward the spawning grounds.

In the area immediately above mean high water, Tlingit distinguished important geomorphologic variations in stream characteristics and how salmon utilized such areas. They also observed critical physiological changes in salmon as their form, coloration, and quantity of body fat were radically transformed in the new environment. Through experience of generations, Tlingit were that the decline in body fat made the in stream salmon preferable for being able to dry salmon for long term preservation and consumption later in winter. As noted earlier, the Tlingit developed a taste preference for dried fish from the in stream harvested salmon.

Intertidal stone structures

Throughout the *Hinyaa* area, there are many remains of intertidal stone fishing structures built typically in the estuaries of streams, close to the mouths of streams, or at advantageous locations along a migratory corridor used by salmon. The common form of the structures is described as follows by Christine Edenso, a *Hinyaa L'eeneidi* woman:

> "I've observed in my younger days that…Tlingits 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)

Mrs. Edenso's niece, Clara Peratrovitch, continues in the same vein as follows:

> "*If you folks ever go right up to Klawock Island right at the point – it is half way down between the low tide and the high tide. It's just like the beach is swooped down…the rocks are piled high like a half, semi-circle. It was at the time when I first saw it, pretty high. It's not very high any more, but you go across there at half tide, you'll see the semi-circle. …when the tide goes up… you will see how the fish were chased into it. And it's a secluded area for them, they think its safe so they stay there until the tide starts going down, then they're stuck back there. They can't get out. And the boats, dug-out canoes, are out there trying to keep them in. They have paddles and they hit the water to keep the fish from backing out."* (CP TR01: 10)

Mrs. Peratrovich's remarks add the additional important point that some human action was needed, the slapping of paddles in this case, to keep the fish behind the rock walls until the tide had fallen sufficiently so that they could no longer swim out.

Ron Williams was taught about the intertidal stone structures in the Klawock area by his grandfather, Harry Watson:

> "*My grandfather used to tell me when we rowed from here to Craig, get fuel and come back. And he pointed out to me where all the good fishing was …for trolling, gaffing and where people would put rocks. Where the rocks were, [that's where] when the tide goes out they'd go and get fish."* (RW TR: 5)

Williams continues about where the sites were located as follows:

> *"One was right where the Klawock dock is, on the other side of Klawock Island… going through Canoe Pass, right in between there…they used to stack up rocks, where the fish went in on the tide and then backed out. And before 'the divide' was filled, before that area was filled in, they used to trap fish that were going out that way too. …he said they used to trap fish out past Crab Creek…and Port St. Nick, before they logged Port St. Nick and killed off the river out there, they used to have them down there too."* (RW TR: 6-7).

Of the areas discussed by Williams, remains of former intertidal stone fish traps can be identified in all but the Port St. Nicholas area. Immediately south of Port St.

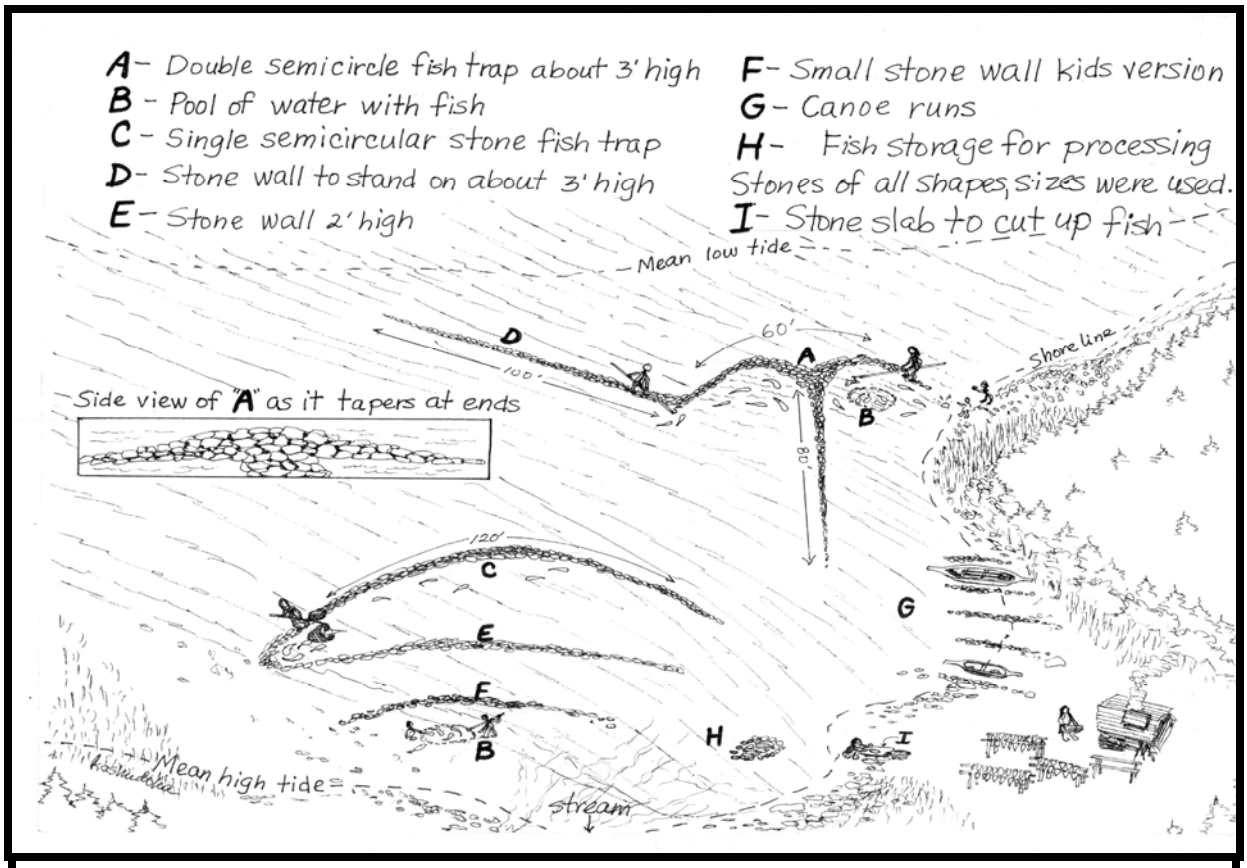


Figure 6 Intertidal stone fish trap complex reconstruction near Klawock. Sketch by Wanda Culp

Nicholas, however, in Doyle Bay and at the mouths of numerous streams all around Trocadero Bay are remains of small scale intertidal stone structures. The reconstructive sketch on the previous page is partially based on the configuration of the remnant rock structures just north of Crab Bay mentioned by Ron Williams.

Ron Williams also notes the following concerning the design and use of the intertidal stone fish traps:

> *"The further off shore you got, the higher it was…They never made a complete circle and the fish got caught in there when the tide went out and they'd just go and get it. They said never, never let the fish sit. As soon as the tide went out they were there to take care of it. They never set in the sun."* (RW TR: 31)

This observation demonstrates that the stone walls were built higher at their lowest intertidal point and were not therefore of equal height from one end to the other. This design principle would improve the effectiveness of the trap as the tide would fall below the lowest point on the trap earlier than if the wall was the same height throughout its entire length. His second observation indicates that the design was semi-circular and never closed, a point further discussed below. Finally, Mr. Williams' statement that fish were to be taken immediately has multiple pragmatic and relational meanings. Pragmatically, immediate taking of the salmon would maximum nutritional value by not letting them dry out in the sun and would reduce predation by mink, bear or various birds. It would also be a sign of valuing and therefore respecting the salmon's sacrifice.

Along the shores of Portillo Channel, west of Klawock, a number of intertidal stone fishing structures at several different sites are readily discernible. The site termed San Clemente Island is depicted in the accompanying aerial photograph. The primary feature identifiable at present is a bi-lobed structure consisting of two semi-circular fish traps joined by a stem that extends to mean high water, bifurcating the two traps. The east arm extends through the intertidal estuary of the stream to the opposite shore while the west arm circles back up to end at mean high water. Further down the intertidal zone below this joined feature are segments of rock alignments likely organized into other fishing structures. On the opposite (south side) of the stream, several additional semi-circular as well as straight stone alignments can be discerned. The amount of construction would appear to indicate that this was at some point in the past a significant fishing site utilized by many families.

Figure 7 Aerial view of intertidal semi-circular stone fish traps near San Clemente Island, Portillo Channel west of Klawock.

In the summer of 2002, when discussing these structures with Klawock Tlingit elder Theodore Roberts, he recalled that in the fall of 1929, as a seven-year old boy, he had been taken to the intertidal stone fishing structures inside San Clemente Island and had participated in using them to catch dog salmon. On a visit to the site later that summer, Mr. Roberts described how his grandfather, Fred Williams had come with about 20 people, mostly children and older women to the site to use the fishing structures. Mr. Williams had positioned the grandchildren (of which Theodore Roberts was one) on the on the outer edge of the trap nearest the stream and on the opposite, east side of the stream. As the tide receded, Mr. Williams and several other accompanying adults stood in the stream and drove the salmon into the flat where the trap was located. The children were told to throw rocks in the water on both sides, that is where the fish approached the wall to keep them inside and when the fish approached the estuary to drive them back

into the trap. "We couldn't stop throwing rocks until the tide went down – it was our job." (TR PC 2002 recorded on digital video camera). Mr. Roberts indicated that only the inside trap next to the stream was used on that occasion and that it produced a sizable quantity of dog salmon in one tide that were taken back to Klawock and distributed to related families for processing.

Concerning the present condition of the structures, Mr. Roberts remarked that the walls were higher in 1929 than at the time of the recent visit. He indicated they were approximately knee height in 1929. He believed that southeasterly storms had knocked down the structures in the intervening years.

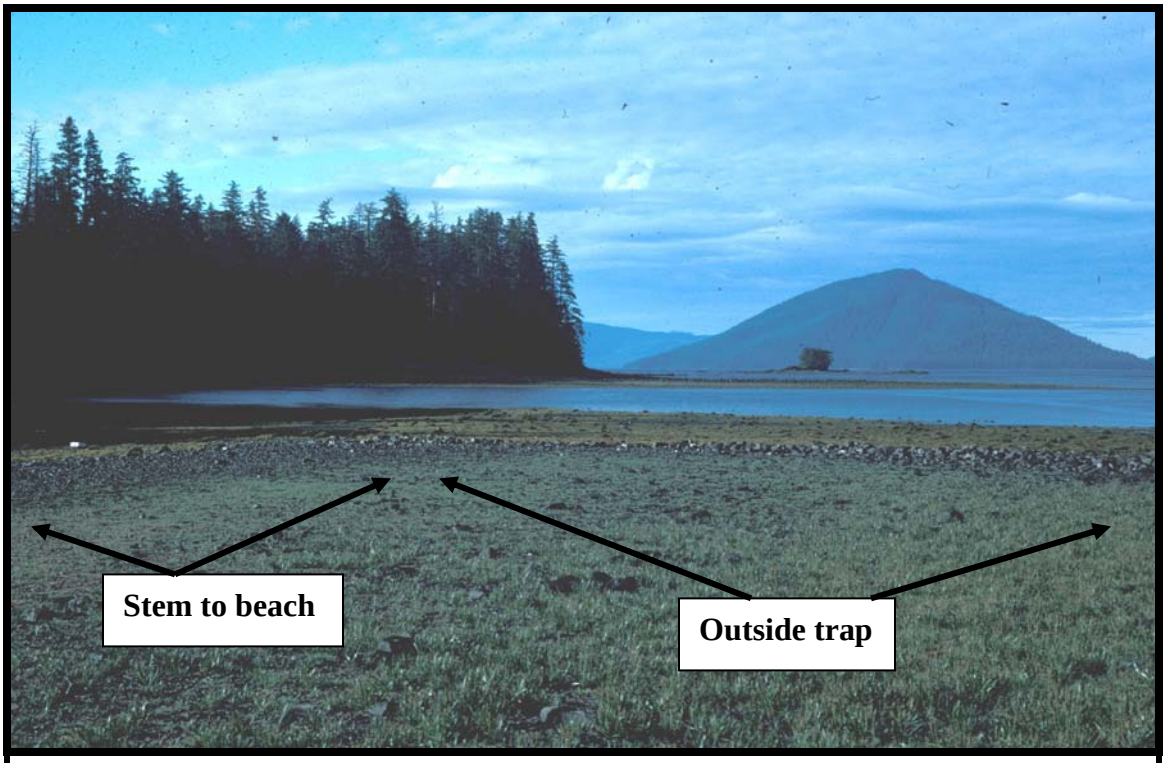


Figure 8 San Clemente Island fish trap viewed from the high water line. Stonewall left center in the picture forms the stem while semi-circular arc from center to right edge forms the outer trap.

Several Klawock Tlingit elder interviewees, described intertidal stone structures as "baskets" and "dishes". A totem in the Klawock totem park has a dish with three red (sockeye) salmon in it that is part of the *Kakoshitaan* clan representation of their ownership of the *Sarkar* (Deweyville) sockeye stream and lake. In addition to the semi-

circular stone traps, smaller circular holding areas in the upper tidal areas where fish were placed after being captured and dispatched are also described by a Klawock interviewee (note depiction of this feature in reconstructive sketch above). It is therefore important to distinguish the semi-circular large stone wall traps from the smaller circular holding areas. It is the latter that are likely the reference for the "basket" and "dish" referents.

There is yet another possible implication of the reference to "dish" by the Tlingit elders. In some of the semi-circular intertidal traps, a pond was excavated in the beach in the middle of the structure. As the tide fell, the pond would remain full with water and the trapped fish would retreat to this constricted zone when the remainder of the intertidal area had dried up. This allowed the people to obtain living, fresh salmon for consumption or processing. The "dish" on the picture of the totem below may well represent this design element associated with the intertidal stone trap.

Figure 9 *Kakoshittan* pole with "dish" holding sockeye salmon. The descendant of this pole, a copy from Tuxecan first erected in 1939, is now in the Klawock totem park. Photo from Special Collections, University of Washington Library.

The Tlingit term for the semi-circular, intertidal stone trap is *tekshu* (FE TP) while it is also referred as *shaal* (CP TR: 2) a more generic term for fish trap (Emmons 1991). Hoonah interviewee Lily White also used the term *shaal* for fish trap (LW TR: 2)

The intertidal stone fishing structures on the west coast of the Prince of Wales Island come in a variety of forms and sizes. The two basic designs are a straight wall – here termed a weir. Relatively rare, these structures typically intersect the estuarine portion of a stream but do not fully cross the intertidal stream. The other basic design generally takes the form of a semi-circle and less frequently a V-shape. The lowest point in the arc of the semi-circle or the point of the V is at the bottom of the structure, nearest to the low water line. The semi-circle and the V are open on the upper side toward the forest. The forms can be combined into composite structures (note the bi-lobed fish trap illustrated above) or a number of independent traps can be built in the same basic area forming a complex.

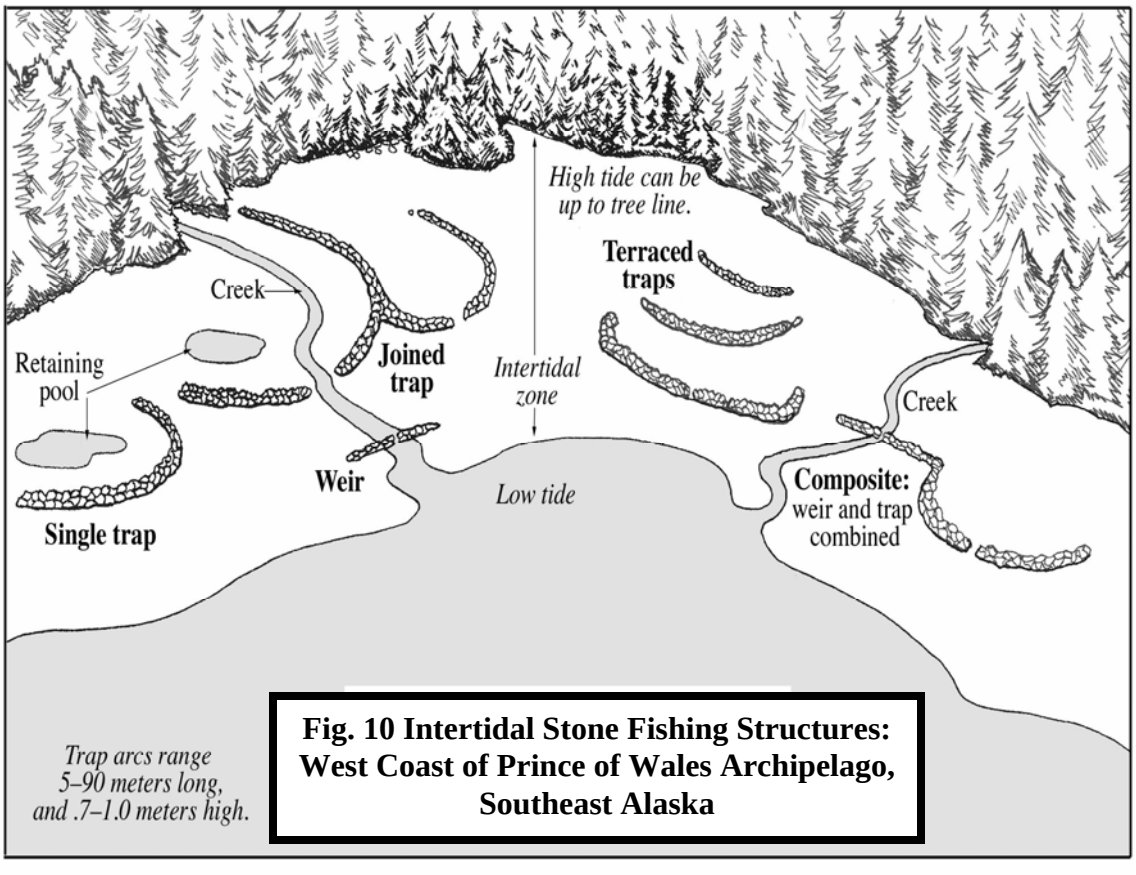


Fig. 10 Intertidal Stone Fishing Structures: West Coast of Prince of Wales Archipelago, Southeast Alaska

A most fascinating complex can be found at Fern Point on the east side of San Fernando Island where semi-circular traps have been built at different levels in the intertidal zone forming a terrace-like pattern. The arrangement of the terraced traps of Fern Point demonstrate Tlingit understanding of the different heights reached by the tide during the tidal range. The cascading structures at this site conceivably allowed for harvesting through virtually the entire six hours of the ebb tide. Further discussion of these structures can be found in Langdon et al 1986, Langdon 1987, and Langdon 2006. The figure above depicts a general range of the intertidal stone fish traps found on the west coast of the Prince of Wales Archipelago.

Figure 11 Intertidal semi-circular stone fish trap with gap at approximately half-tide on the ebb. The trap is part of a composite in a complex on the southeast corner of Lulu Island. The person walking on the trap gives an idea of the scale of the construction.

One final significant design feature of the intertidal semicircular stone traps deserves mention. At the lowest point on the semi-circular arc a gap was placed in the wall at a number of locations (see Fig. 11 on the previous page). In observing the pictured trap during falling tide, I noted that at a certain stage of ebb, when the tide is about three-quarters down the stone wall, the waters trapped behind the arc begin to pour out of the gap. It seems likely that in previous times a circular basket trap (discussed above) was inserted in the gap and would capture fish that sought to escape through this apparent route. When the people completed their harvesting, the basket trap could be removed and any other fish that might find themselves behind the wall on falling tide were able to depart the trap through the gap.

Intertidal wood stake fish traps

Remains of wood stake alignments provide the evidence for ancient Tlingit mass salmon harvesting in the estuaries of southeast Alaska as noted earlier. However, none of these structures were ever observed in practice by an of the Klawock interviewees. These structures were outlawed and likely destroyed as early as 1896 by federal fisheries protection legislation and the agents empowered to enforce the regulations. A brief discussion of the remains of wood stakes buried in the intertidal estuaries and beaches of the Klawock River and Little Salt Lake is provided here although it is important to emphasize that such remains can be found in the muddy estuaries of many southern southeastern Alaskan salmon streams. No complete inventory of the forms and distribution has been produced. The discussion below is based on site evidence.

In the Klawock River estuary and lagoon are located a profusion of wood stake features. Along the course of the estuarine portion of the Klawock River are found V-shaped wood stake features, sometimes buttressed by rocks, built by driving wood stakes tightly together into the beach. The V is actually asymmetrical as the long side of the V runs parallel to and on the slower moving edge of the estuarine river while the short side juts at an approximately 45 degree angle up toward the shore. One V-shaped feature in the mid-tidal range with protruding stakes has been dated to 785BP. Above it toward the first falls of the Klawock River, are many individual as well as aligned stakes. The

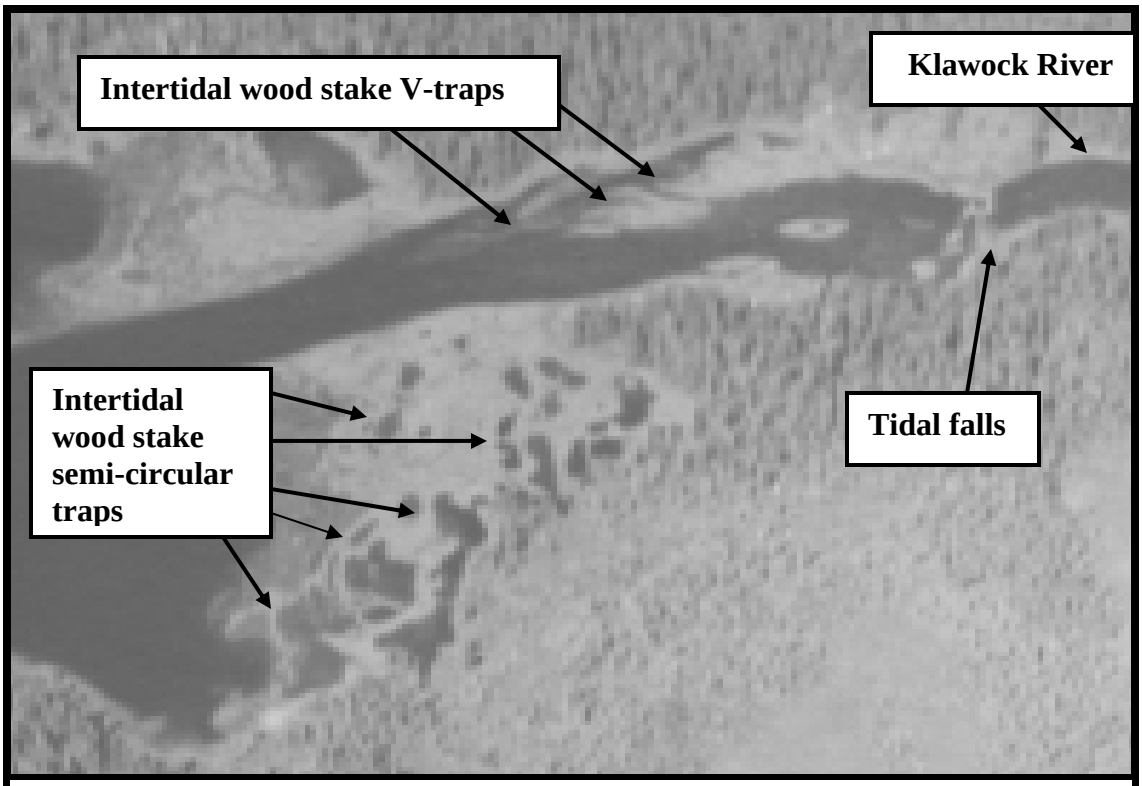


Figure 12 Aerial photo of Klawock River, Estuary and Lagoon from 1929 showing locations of wood stake traps. Photo from US Forest Service

alignments are laid along the same design principles described above, i.e. a long side paralleling the flow of the river and a short side angled toward the shore.

These structures, whose ancestry likely extends into the past for several thousand years, have created depositional contexts for materials being brought down by the Klawock River. The buildup of these materials has created a series of islands with V ends pointed toward the low tide line. The harvesting strategy is similar to that of the semi-circular intertidal stone fish traps discussed above in that they are constructed such that salmon are caught on the ebb tide as they are funneled into the V of the traps.

These structures appear to have been built in multiple stages perhaps over thousands of years, gradually extending the human "beachscaping" farther into the intertidal zone.

Both the V traps and the semi-circular stake traps appear to have been constructed at a scale appropriate for house group utilization.

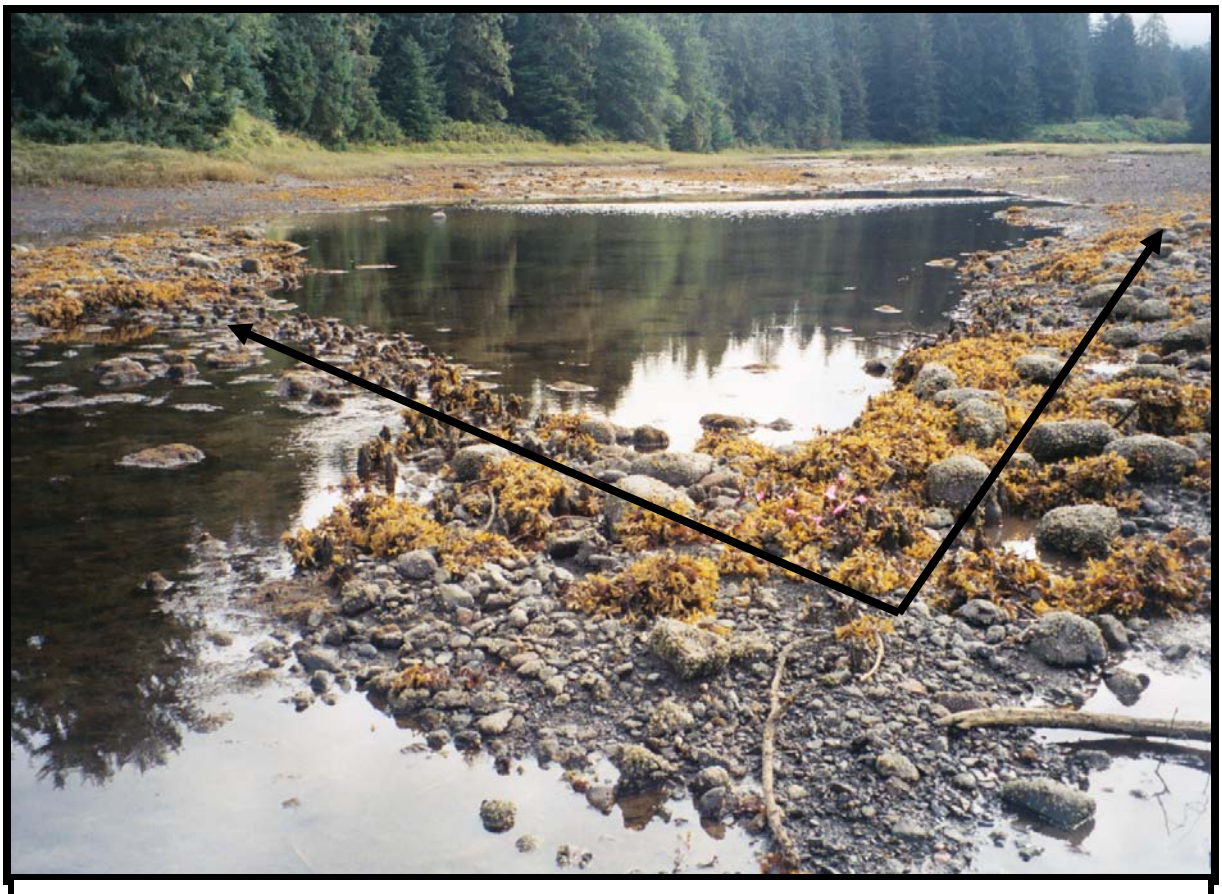


Figure 13 V-shaped wood stake fish trap located in the Klawock River estuary. Pink dots are survey tape attached to individual stakes. Over 700 buried stakes were used in this structure.

The lagoon on the south side of the estuary displays a different set of features than the estuarine V traps. In this soft intertidal zone, absent stone, wood stakes were used to construct semi-circular traps. As the aerial photo above indicates, the lagoon's form has been "beachscaped" by the placement of the buried wood stakes into a host of semi-circular forms. Stakes are still visible in several locations in the area. The design of these devices is such that they operate according to the same principle as the intertidal semi-circular stone traps discussed above. The intertidal substrate and available materials appear to dictate whether stone or wood was used.

As the aerial photo below indicates, the structures can still be seen. Even when the tide is fully out, the traps continue to hold water. There is a wood stake canal connecting two of the traps which would allow salmon to move between different pools or people to separate them for processing. By holding water and fish throughout the tidal

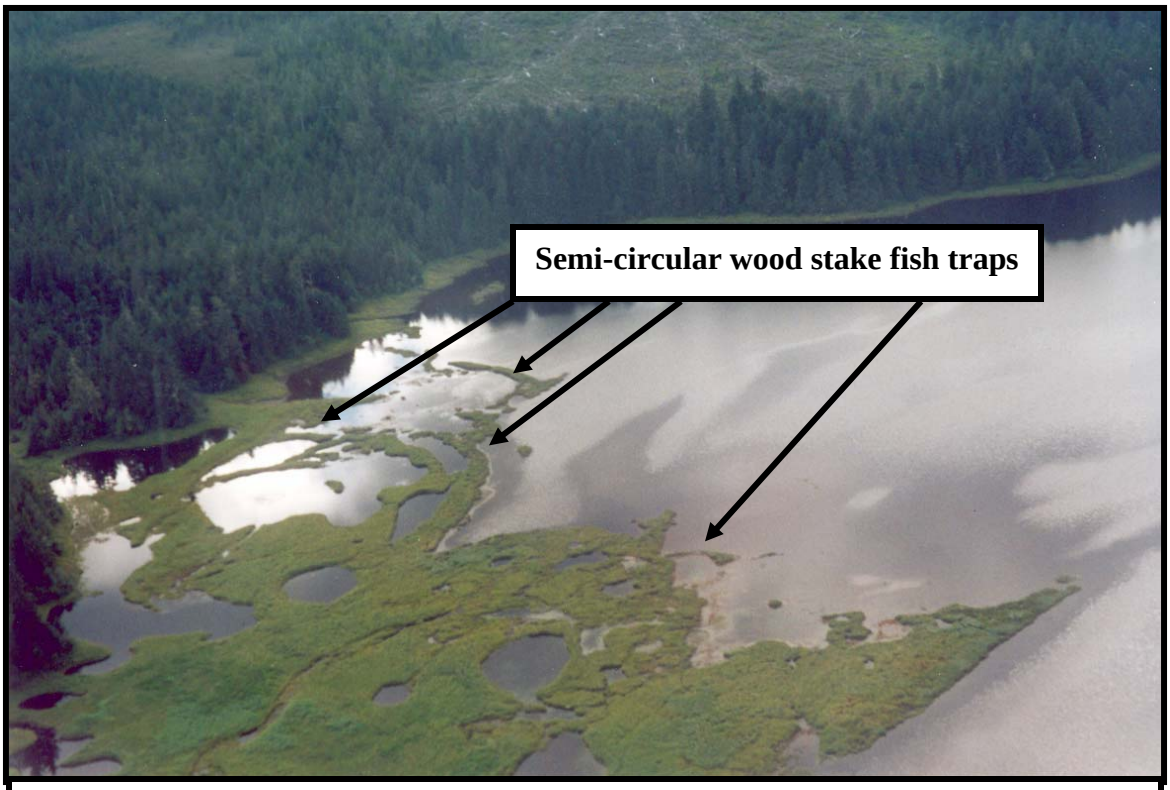


Figure 14 Contemporary aerial photo of Klawock Lagoon showing remains of intertidal semi-circular wood stake traps to the south of the river estuary. The beach greens have grown on the soils deposited inside the former traps.

cycle, nutritional value would also be increased and time would be bought for the processors to complete their activities prior to the next high tide.

Little Salt Lake (*Gaks heen*) is located about two miles north of Klawock. The intertidal and estuarine landscape of this bay is also filled with the remains of wood stakes in various different alignments. Wood stake structures in Little Salt Lake have been dated to 2100BP and demonstrate additional forms beyond those discussed up to this point (Langdon In press). There are numerous alignments of buried remnant wood stakes in linear patterns, some with stakes side by side, some with stakes that still have branches, some with stakes at intervals of about three feet and some with intervals of paired stakes. The two streams that enter into this embayment support pink, dog and coho salmon at the present time.

A detailed discussion of all of these patterns will not be undertaken here but one description of the possible use of the stakes can be inferred from one of the Klawock interviewees' description. Most descriptions of Tlingit salmon use in the historic period

describe a system of lattice-weirs or fences funneling salmon into basket traps of one kind or another. Mrs. Peratrovitch describes a different use of the "fences" or "mats" that may correspond with at least some of the patterning found in Little Salt Lake:

> *"Later on in years, the women went and wove a long mat-like. They plaited long wide strips, cedar strips, and rolled it, real long mats that they can run through the stakes and scare the fish at high tide. The stakes are put in there and they run the mat through after the fish [go up]. Or if they scare the fish through the stakes to the other side and so the [canoe] comes along and put that mat and fences in. See they pull it through after the fish is on that side, on the beach side. They pull the mats through and block them in. It's the same thing as the rock pile, the well. They don't jump around; they just stay there. Then the tide goes out and they're blocked in."* (CP TR01: 1,19)

Figure 14 below shows the location and form of mapped buried wood stake alignments and features in Little Salt Lake. Both semi-circular intertidal wood stake traps and linear alignments are indicated. Mrs. Peratrovitch's description above likely relates to the paired stakes as she indicates that the mats were "run through the stakes" implicating the paired stakes as supports for the mats. The figure below does not indicate which of the alignments is comprised of the paired stakes.

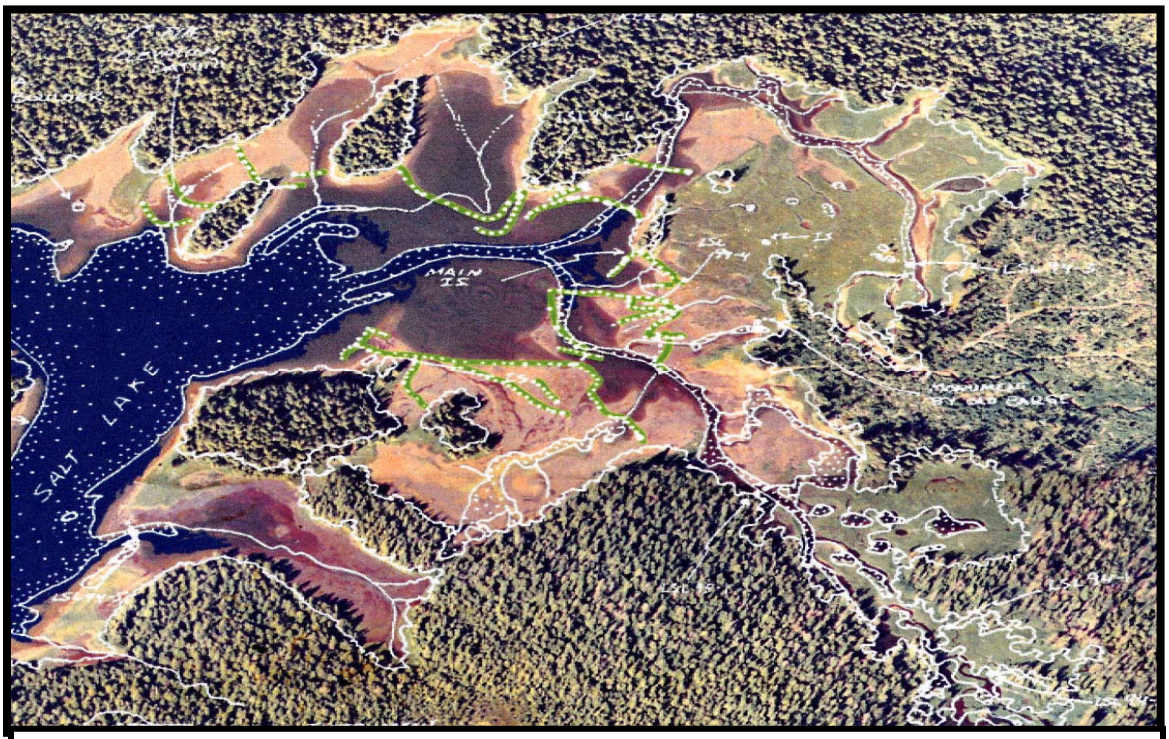


Figure 15 Little Salt Lake showing locations of estuarine wood stake traps. Two streams enter the embayment from the right. Green lines with white dots indicate the locations of intertidal wood stake alignments in various forms including the semi-circular form.

Commentary on Intertidal and In stream Stone and Wood Structures

An extremely important principle of harvest is implicit in the intertidal semi-circular stone and wood structures described by interviewees and depicted and discussed above. All of the structures are designed to capture salmon on the ebb stage of the tide. The vast majority are positioned at or in the vicinity of half tide. They are also positioned in the tidal flats adjacent to and perhaps slightly intersecting the stream channel in some cases. At the top of the flood stage of tide, the structures are completely inundated by water and pose no barrier to salmon seeking to ascend the nearby streams. Even weirs that cross the estuarine sections of the streams are fully covered at high water. The structures only begin to be functional as fish traps on the falling tide as some of the salmon begin to retreat from the stream mouth on the ebb. At approximately half ebb tide, fish behind the traps are caught and can't escape but no additional fish can be captured by the structures as the tide continues to fall. In effect, the intertidal semi-circular traps can only harvest fish for approximately 25% of the tidal range and only on the outgoing portion of the tide.

The intertidal semi-circular structures are designed to use the tidal action and patterns of schooling and milling exhibited by pink and dog salmon to capture fish. I have used the term "tidal pulse fishing" to characterize this pattern. A more extended discussion of tidal pulse fishing can be found in Langdon (In Press) discussing the linkage of this design to the salmon boy mythic charter.

A brief point of contrast with lower stream mass harvesting techniques is in order. The design of the intertidal semi-circular fish traps results in obligatory escapement – those salmon seeking to ascend the streams are able to without impediment or obstruction. In stream devices consisting of combined weirs and traps that block the entire stream course must have built in built in human monitoring to insure that some portion of the salmon run can move into spawning areas above the closed off zone. These forms have to be put into place as at a specific time and then taken out. This is precisely the practice that De Laguna (1972) describes for the Yakutat Tlingit. The in stream box trap and weir she discusses were used for a short period of time and then taken out. Pictures presented in Moser (1898) of lattice traps found at Karta Bay show that they were stored in the forest areas near the streams, apparently following

completion of their annual use. It is also the practice that Patrick Mills describes for the use of the in stream weir/trap on the Neva River discussed above.

Lower stream harvest technologies

Tlingit salmon mass harvesting technologies located in the lower stream zone described by interviewees appear to differ in scale, complexity and strategy. They differ from the estuarine forms in that they must channel the salmon's tendency to move upstream and use that behavior to harvest large quantities. The in stream technologies described are of two basic patterns based on whether a barrier was erected across the entire stream or only a portion of it.

Simpler strategies that involved small scale, short term structures were described as small "corrals", semi-circular structures with the bulge oriented downstream. These could be made either of wood stakes (TJ TR) or stones (CP TR). Stakes driven tightly together were indicated by the Hoonah source while the small stone semi-circles (used for other purposes as will as described elsewhere in the report) were described for the Klawock River. In either case, they were placed at the edge of the stream and extended out into the stream but did not stretch past halfway across the stream. These structures required human assistance as people would drive salmon into them. This practice was based on salmon's willingness to retreat downstream when impassability to their upstream ascent was encountered. As the salmon retreated back into the semi-circles, male harvesters would use spears or gaffs, to obtain the fish. No basket traps are described as being used in association with these small, simple structures. Because they did not block the streams, these structures could be left in place since salmon could simply avoid them by moving to the other side of the stream and continuing their upstream travel. They were not taken out of the streams. Several of these are still evident in the lower section of the Klawock River above the tidal falls.

The more complex strategy typically associated with Tlingit salmon harvests in the lower stream is the construction of a lattice-frame weir across the stream that would create a barrier to upstream movement. In the lattice weir at different locations might be positioned square, rectangular, or most commonly described are circular basket traps often consisting of one conical trap inserted into a larger trap. The inserted conical trap had sharp pointed stakes on the interior that would prevent the salmon from turning and

attempting to retreat through the opening by which it had entered. The large circular basket trap was designed to hold a substantial quantity of fish. It was often designed with a cap at the end so the fish could be emptied or a few taken without having to separate the trap from the weir.

John Darrow (Olson 1934) described one of these combinations as being operated in the Klawock River. Olson's field notes include a sketch of the structure. The barrier crossed the river in the lower section and the traps were positioned on each shore of the river at the end of the weir. When salmon encountered the weir they moved latterly along it to the river edge whereupon they turned and headed back down stream into the circular traps that were positioned to capture them as they turned and headed out. This differs from the usual design in which salmon would be channeled into the circular traps positioned on the upstream, as opposed to downstream, side of the lattice weir.

A large and well-preserved example of this kind of circular trap in a barrel form was discovered in Montana Creek outside Juneau several years ago and is housed in the Alaska Museum. Rather than tapering at one end, the Montana Creek trap appears to have been designed to hold fish alive. This would allow humans to select the fish and take them as their processing schedules allowed. It would also allow certain selective strategies discussed below to operate.

The lower stream lattice weir and circular trap structures were outlawed and destroyed in most of southeast Alaska by federal fisheries employees in the 1890s and early 1900s so none of the interviewees reported ever seeing them in operation. However several interviewees were aware of them.

Klawock interviewee Clara Peratrovitch described the trap as follows:

> *"Years ago when they wanted salmon in the river they couldn't get it anywhere else, they made ... how do you call those ... they weave those sticks ... and make a ... how do you call a pouch like ... they weave all the little sticks together [from] young trees, and at the end ... they have [an opening] ... facing out ... like that. And just a small entrance to the inside and when the salmon get in there, drifts in there, it goes through that hole and stays inside. It can't come out because of the sharp prongs. And when that gets full ... the old timers used to take it out, roll it to the shoreline empty the fish out ... And after it's emptied out, they put it back in that wall again."* (CP TR: 22)

Hoonah interviewee Lily White recalls stories she was told about the former use of these traps as follows:

> *"(At that time, there were no fish hooks.)* A áwé héen tu…héen ta yin x̲'eiduteech. *(Fish traps were placed in the water adjacent to the streams.)* Ag̲eit áwé naahinch. *(The salmon swam inside the fish traps.)* Yandei dusyík̲ch wé k̲aax'wch. *(The men pulled the fish traps ashore when they trapped the salmon.)* Yei áyá dudluk̲wxun ya x̲aat aag̲aa. *(During that time, that's how the salmon were caught.)* (LW TR: 15)

Mrs. White goes on to further describe additional aspects of trap use and the amount that it could catch in this section of a story about one man's activity:

> "Chookaneidi *fish traps were at Game Creek. The fish traps caught enough salmon to distribute to the whole town. Then he towed the fish trap away. More salmon than in this area moved up the bay [Port Frederick], Neka Bay. That's where he towed the fish trap. Still, they brought a lot of fish from there. They tied the fish to the boat. They towed the salmon. A lot of fish on one [trip]. They brought the salmon for the people of the village.* (LW TR: 15)

While replete with additional social information about distribution, Mrs. White's remarks indicate that the trap was large, capable of holding many fish, moved from one stream to another and that when full of fish the trap was towed back to Hoonah.

While these technologies were essentially abandoned in the 20th century due to federal and state fishery regulation, monitoring and prosecution, the Excursion Inlet families developed a short-term strategy for blocking the Neva River in a limited area, taking the needed salmon and providing a gate to allow the salmon to move upstream when harvesting was not occurring. The structures were fully removed from the stream at the end of the season. Rather than circular basket traps, which require a substantial effort to manufacture, the design uses branches to trap salmon once they turn back down stream. The users were emphatic that these structures were short term and removed as soon as they had served their purpose. A sketch of the structure operated on the Neva River is found on the next page.

The quick removal of the barrier for capturing was juxtaposed to what Thomas Mills felt was the unnecessary manner in which the present fish counting weir was being operated. His observations follow:

> *"I'm not too sure whether it is the State or the Feds that have a weir that is blocking off the whole river and it's not being attended right."* (TM TR: 32)

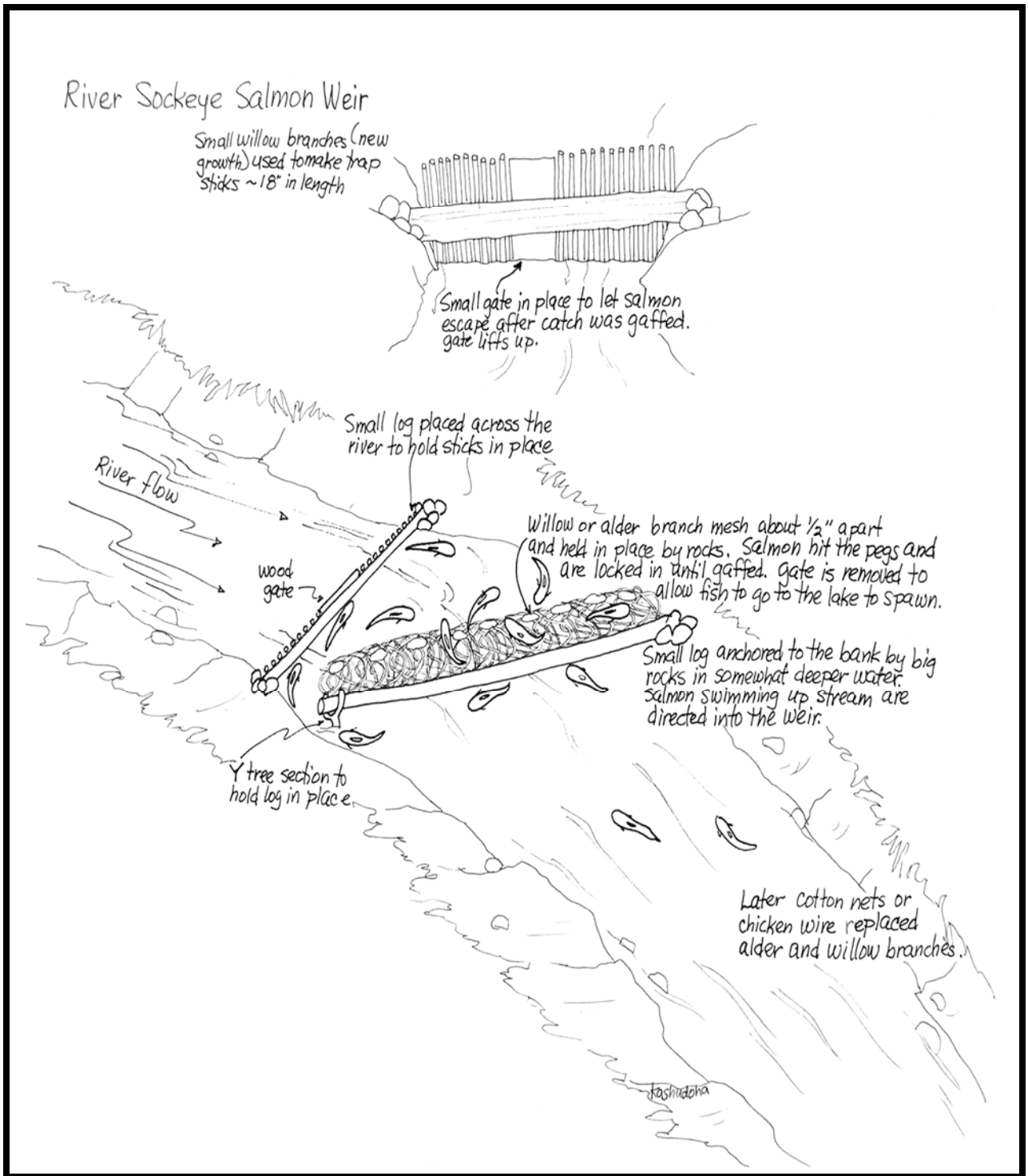


Figure 16 Sockeye salmon weir structure used in the upper Neva River. Note the gate feature for allowing salmon to move upstream during periods when it was not needed for harvesting. Sketch by Wanda Culp.

In Mr. Mills view, "not being attended right", means that since the weir "blocking off the whole river" the attendants had clear obligations to the salmon. They were not

allowing the fish to move up on a daily basis; sometimes the fish were having to remain below the weir for several days.

In stream harvesting: Spears and Gaffs

While the mass harvesting of salmon for processing (drying and smoking) and storage for later usage was done in the estuary and in the freshwater immediately above the mouth of the stream or river, in stream harvesting with various devices was an important activity as well. At the present time, some households are able to acquire the entire quantity they desire for winter use from in stream harvests using one or the other of the devices described below.

Two devices, each with several varieties, were described by Klawock and Hoonah interviewees. In English, they are referred to as "spear" and "gaff". Klawock interviewees overwhelmingly speak of using the "spear" while Hoonah interviewees uniformly speak of using the "gaff". Well into the latter part of the 20th century, construction and deployment of these devices was male activity. Clara Peratrovitch (CP TR: 21) comments:

> "*They fixed it a long time ago…and my mom couldn't do that, so my dad made her one that she could just hook. But a lot of times she misses."*

The "misses" Mrs. Peratrovitch describes are likely the result of the fact that as an elderly woman, her mother was not skilled at the use of spear which requires extensive practice as a young person in order to be deployed effectively. Gender segregation of work associated with fishing was strongly practiced in traditional time; menstruating women were thought to drive the fish away and therefore were not allowed around fish traps or to be involved in the harvesting process. Mrs. Peratrovitch describes the beliefs below:

> *"The women were not allowed to do the manly work because women were considered polluting, spiritually polluting because of their being women, their menstruating. Nobody knows when a polluting vision will come to the animals and fish and it creates bad luck for the hunters and fishermen."* (CP TR: 30-31)

The same pattern holds true in Hoonah as well.

For the last 20-30 years women have begun to participate in salmon harvesting activities of various kinds in contrast to their traditional exclusion from "spearing" and "gaffing".

SPEAR

The spear described and used by the Klawock interviewees has the Tlingit name ***aadaa –*** "the one that jabs and the hook pops out…" (CP TR: 20-21). Clara Peratrovitch provides the following description of the ***aadaa****:*

> "*The spear is a long pole, say maybe about 20 feet long, and on the end they have one of those big hooks, like they use for gaff hooks. It's round, half moon, and the bottom part is a little longer. [The hook] has a little tip that is bent down. When they put it on the pole, they have a string wrapped real good. They put a groove on the [end] of the pole and then they put the string on the end …and then they put the hook in there [groove]. When they put the hook in there, they've got a long braided [line] connected to the hook so the braided string hangs way down…but the hook is on top."* (CP TR: 20-21)

Ronald Williams recalls observing his grandfather's spear as follows:

> *"It was maybe 12-15 foot long, sort of maybe about an inch and a half to two inches at the head and came to a taper, a real pointed taper. … they grabbed the biggest hook and cut the eye off of it…and…carved a little groove on the front. And they would wrap it, put the hook on, wrap it with leather and then wrap it with hanging twine. That's because when they go to slide the hook back in again, they wouldn't have to keep tying it; the leather kept it from tearing up the string. The hook is on top of the pole, faces forward…so when it went in, it grabbed the fish and pulled out; the fish would be on the hook."* (RW TR:14)

Byron Skinna's grandfather, Charles Demmert, made him a spear that he started using when he was 10 or 11 years old. He describes his spear as follows:

> *"It was a pole about 18 feet long…on the front of the pole you tied, up the pole a little bit, a piece of leather on the top and you had a line tied to your hook, a pretty good sized hook, and you put the hook down underneath the leather to hold it there. When you speared the fish, the hook would come loose from the pole but the line would stay attached. That would give it the fish some play."* (BS TR:14-15).

James Martinez also recalls use of the spear in the Klawock River by himself and others in the later 1930s and 40s:

> *"It was a 16, 18 foot pole with a hook on the end that was tied to line. When you speared a fish, it comes out and you got the fish on the hook. Then you pull the pole back in with the fish on it. Then you get the hook out but it's easy because it didn't have a barb on it or anything. But you had to move fast and keep the tension on the line or the fish would get off."* (JM TR:38)

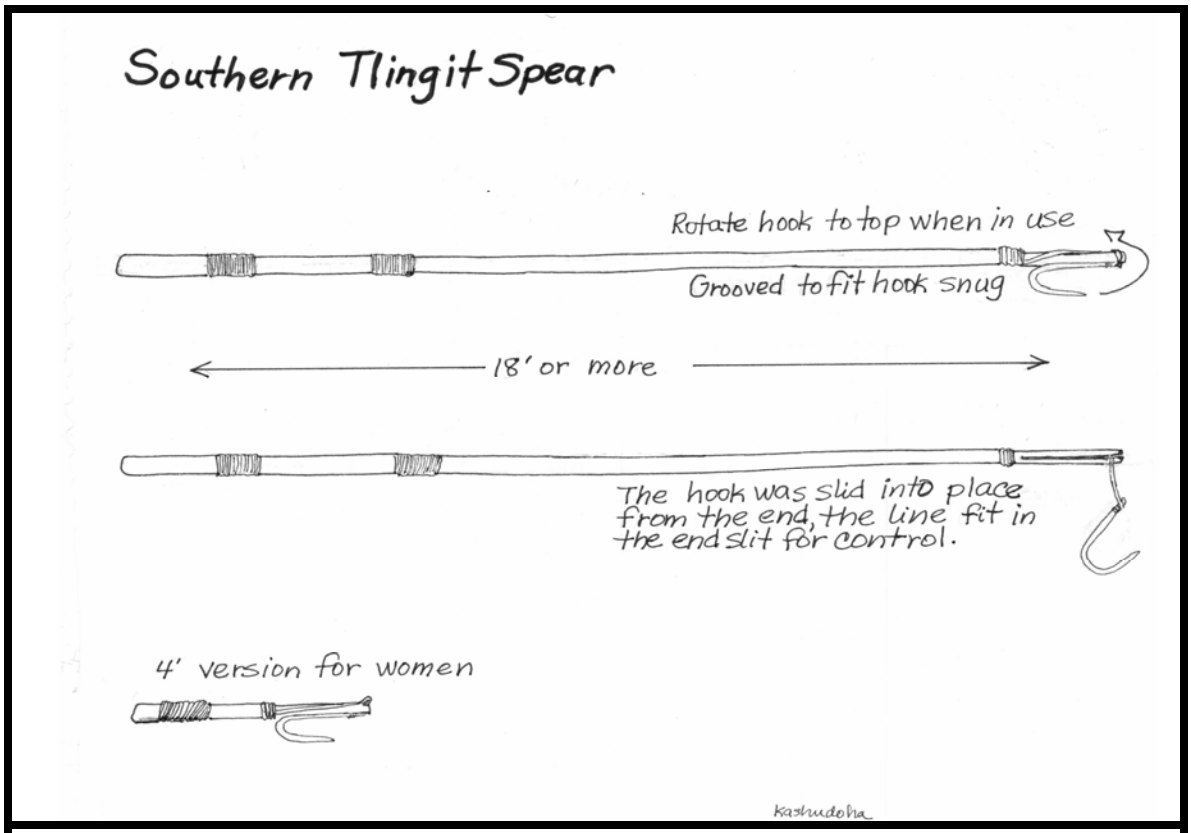


Figure 17 *Adaa* Southern Tlingit salmon fishing spear

While the length of the pole associated with the spear is generally described as being 15-20 long, Mrs. Peratrovitch also described a much shorter one (about 6 feet in length) that was built by her father for her mother. She recalls her mother using the shorter spear with one hand in the tidal pools just below the first falls of the Klawock River (see Figure 17 for example). In commenting on why her mother required a smaller spear, Mrs. Peratrovitch states:

> *"…the other one …it's long and you can see the fish farther. The men folks got stronger legs and strong arms, you know, they're taller and so there's a special spear for them."* (CP TR:21)

The spear was used primarily in the estuary and lower part of the Klawock River where waters were shallow enough to observe the salmon. Jim Martinez recalls that:

> *"I used to go right up …above the first falls. I used to see the sockeyes from there. We used to spear them. I would probably catch about 10. Then later on in July, we'd have to go up to – if we wanted sockeye – we'd have to go up to* **na gwishk' …** *you know it's up there in the river before the fish hole, back about half mile from Salmonberry [Island] you know."* (JM TR: 38-39)

Figure 18 Tlingit spear held with hook released from pole. Note taper of pole with the hook tied to the thinner end. Sketch by James Rowan

The normal deployment of the spear is through a thrusting motion – as it was held in two hands, the top of the hook aimed at the fish – "it was thrust and then you pulled it toward you" (CP TR: 21) Ron Williams describes his use as follows:

> *"I always held it at the middle and when I speared, lunged at the fish, speared the fish, [and then] I would push it down. …That's the only way I could use it, just by over handed, pushing down as fast as I could. And I hooked more rocks than I did fish."* (RW TR: 15)

Clara Peratrovitch states and performs:

> *So there's the salmon… you don't hook the salmon this way [demonstrates pulling motion toward herself]…you jab the salmon, kind of injure it then the hook jumps out and you pull it toward you ."* (CP TR: 20)

Byron Skinna comments that aiming the hook required special adjustments as the salmon were not exactly where your eye told you they were:

> *"When you go out there the first thing you learn…when you saw a fish…you never aim for the fish…you aim for the bottom because of how it looks. If you aim for the top, right for the fish, you'll miss it every time; it would go over the top of them. When you see the fish in the water, it's not right there."* (BS TR: 15)

Similarly Theodore Roberts states:

> *"…you got to aim for the belly…you aim for the bottom of the fish and you'll get it right, you'll never miss it. If you aim too high, you'll miss every time."* (TR TR: 30)

Mrs. Peratrovitch, on the other hand, states that fishermen tried to strike the salmon immediately below the dorsal fin (CP TR:20).

Once the salmon was impaled on the hook, the standard procedure is to lift the captured fish out of the water, so that it dangles ineffectually from the hook in mid-air as depicted in the accompanying photograph. Note as well why a large hook is required so that salmon's body is completely pierced and it will not fall off.

While thrusting was the usual style of spear deployment, it could also be dragged, thrown or tossed. It might be thrown at a specific salmon, into a small group of salmon, or into an entire school of salmon schooling up in the bay. Byron Skinna describes dragging the spear as another type of use below:

> *"Once in awhile, two, three of us would get in the skiff and we would go into the estuary…thousands of fish swimming around in there, big schools. We used to just the pull the spear right into the school and pretty soon the line would be tugging and we would just go chase them down. That was fun."* (BS TR:16)

Jim Martinez recalls tossing his spear up into the air and having it drop into large schools of fish in the Klawock estuary:

> *"We used to go row out in the boat; there used to be some many humpies…when you threw your spear in the air and it would come down on a school of fish and you'd see your fish go bobbing around."* (JM TR:41)

The overwhelming use of the spear reported by Klawock interviewees was as a hand-held device in the waters of the Klawock River where salmon or steelhead could be seen and a particular fish could be selected for taking.

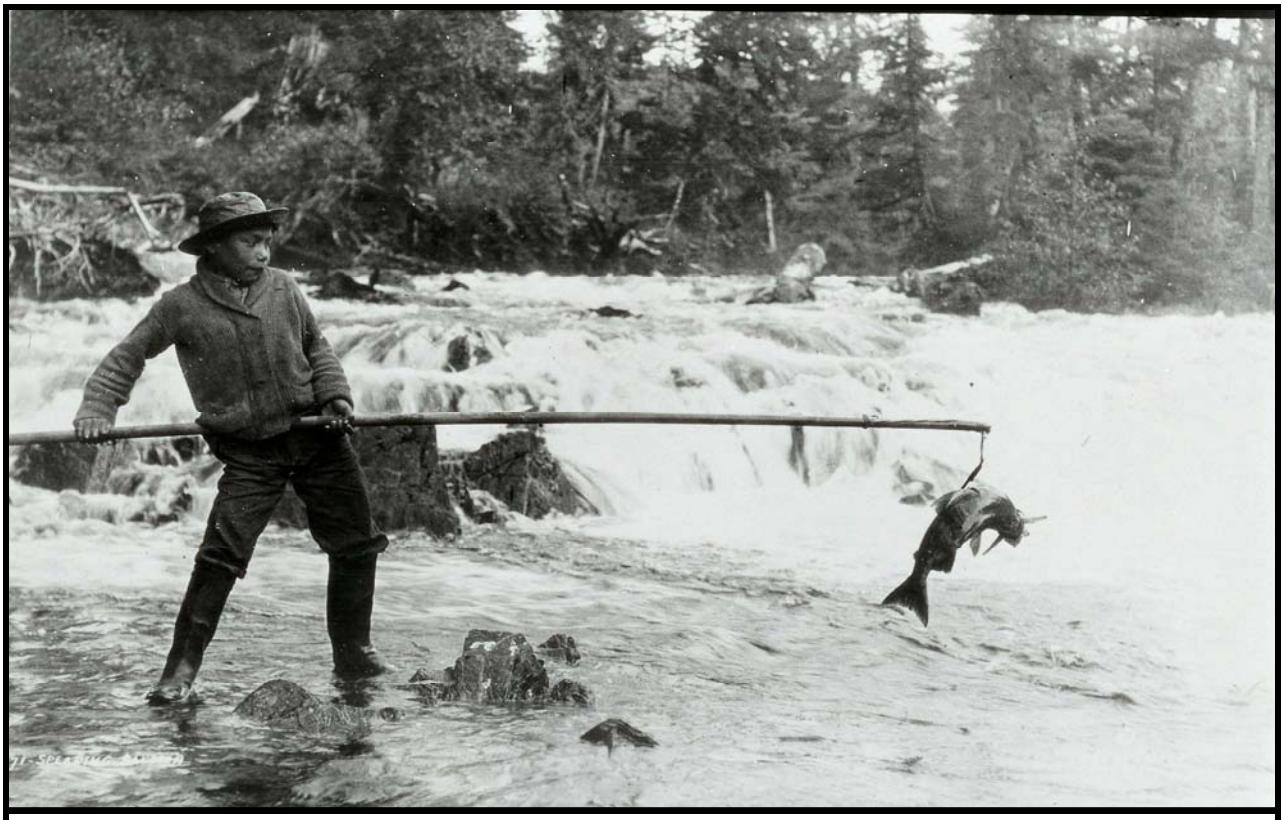


Figure 19 *Aadaa* deployed successfully near Angoon in the early part of the 20th century. Photo from the Trevor Davis collection. Courtesy of the Alaska State Library.

The correct and successful handling and use of the spear required strength and training. It would appear that traditionally, when adult men and relatives were responsible for salmon harvests, young men had to be trained and reach a certain age prior to being allowed to use the spear. Ron Williams noted above that in his early years of using the spear, he "hooked more rocks than he did salmon" indicating that it was no easy task to successfully spear fish. Williams also recounted that the one time he took his grandfather's spear up to the river when he was about 10 years old, he "got in big trouble" for it (RW TR: 14).

Several design features of the spear are important to make clear. A narrow groove, the approximate length, width and depth of the shaft of the hook is described as being carved in the top of the pole. Thus the hook with twine wrapped, crossed and tied around the hook and covered with a leather strip was fitted snuggly into the groove. This was so that it would not detach easily but rather only after being impaled on a salmon. The salmon's reaction would pull the hook and line free from the hold.

Another interesting design feature of the spear is that the hook is attached to the top of the pole, not to the end or the bottom. The logic behind this positioning can be related to Williams comment about "hooking" rocks. The streams of southern southeastern Alaska, and the Klawock River in particular, have substrates generally consisting of rocks, that might be anywhere on a continuum from pebble gravel to boulders. When a fisherman misses his thrust or throw at a fish, the end of the spear will strike the bottom or a rock behind where the fish was. The play of gravity will lower the spear pole end until it strikes some object. The sharp point on the hook is typically protected from actual contact as the end of the wood pole will hit the bottom or rocks. By this design feature, the hook point is protected and the fisherman is able to make many more thrust misses than if the point were to strike bottom or rocks on every time he missed.

GAFF

Male Hoonah interviewees uniformly reported using a device they referred to as a "gaff" as the primary traditional in stream salmon harvesting device. While not used in Klawock, several Klawock interviewees were aware of the device and distinguished it clearly from the spear commonly used by Klawock Tlingit. The Tlingit name given for the gaff in Klawock is ***Kook deidexaa*** ("the one has the hook right at the end facing you, the tip of it facing you…you pull it") (CP TR:21). The Hoonah name for the device is ***K'ix'aa*** (JO TR:18). The same object is covered by these two terms.

> Hoonah interviewee Karl Greenewald described a gaff in following manner:
>
> "*…we used to take long spruce poles because they're limber…about twenty foot long, eighteen maybe…any you have, it's almost like a gaff hook. It's strapped on real tight. The hook had more of a bend in it, almost like the j-hook of a halibut so the fish wouldn't get off."* (KGn TR:10)

Charles Jack provides the following information on the gaff:

> "*I used to help my grandfather make gaff hooks. We'd go look for the straightest young spruce tree and maybe a minimum of 15 feet in length. The hook is set in from the end of the pole… like for cohos and dog salmon, maybe even as far as seven inches. …the reason why they do that is to keep the fish from spinning on the end of the gaffhook when you gaff it. And my grandfather would bone about eight feet of the end…with seal oil over high heat …then he'd seal it with deer tallow. It keeps the seal oil from coming out, because the deer tallow acts like wax [and] gets hard when it cools off. …We had three different gaff hooks.*

> *There's a humpy gaff hook, there's a dog salmon gaff hook, and there's a sockeye gaff hook. The dog salmon gaff hook you also use for coho. Basically, the coho and dog salmon are about the same height and the same thickness. It all depends on the thickness of the fish and how far out they have the poles stick. But for humpies and sockeyes, they don't have to be all that far. "* (CJ TR:54)

In summary, the gaff is hand made to fit the design and needs of the individual user. The pole is typically 12-18' in length with the length depending on the height and strength of the user. It is debarked and boned with deer tallow to keep the surface hard, yet flexible. Poles and hooks are designed for long term use and substantial time and effort are invested in their construction by some users. Some users steam a small curve in the pole above the end to which the hook is attached; the purpose of this curve is to keep the hook off the stream floor so the point will stay sharp and not be blunted. Some users prefer to bend a piece of straight steel into the form they desire and then sharpen the point. Others simply use available large commercial hooks. A groove is made for seating the hook on the bottom of the pole so that the hook fits snugly in place and becomes extremely difficult to dislodge. Twine is then tightly wrapped and tied around the hook and covered with a leather piece to keep the twine from chaffing and unraveling.

Traditionally, the hook was made from a hard wood such as yew according to interviewees who stated that the gaff hook had been a part of the traditional Tlingit salmon capturing technology (CJ and TJ TR). However, Mrs. White claimed that gaff hooks post-dated Russian presence in the area and that traditionally salmon were harvested with traps.

> *"At that time, there were no fish hooks. Fish traps were placed in the water adjacent to the streams. The salmon swam inside the fish traps. The men pulled the fish traps ashore when they trapped the salmon. It was the Russians who introduced the fish hooks. And that's why they got that iron…. To fix hooks. And my father was real good at it. Our people pounded the iron into hooks."* (LW TR: 2-3)

Mrs. White is of the *Chookaneidí* clan whose ancestral home is at *Chookan Heeni*, a glacial stream in Glacier Bay. Perhaps the gaff hooks only came into use in that area following Russian appearance but were used elsewhere earlier by other Tlingit. De Laguna, in Emmons (1991), also reports Tlingit views that the gaff did not pre-date whites.

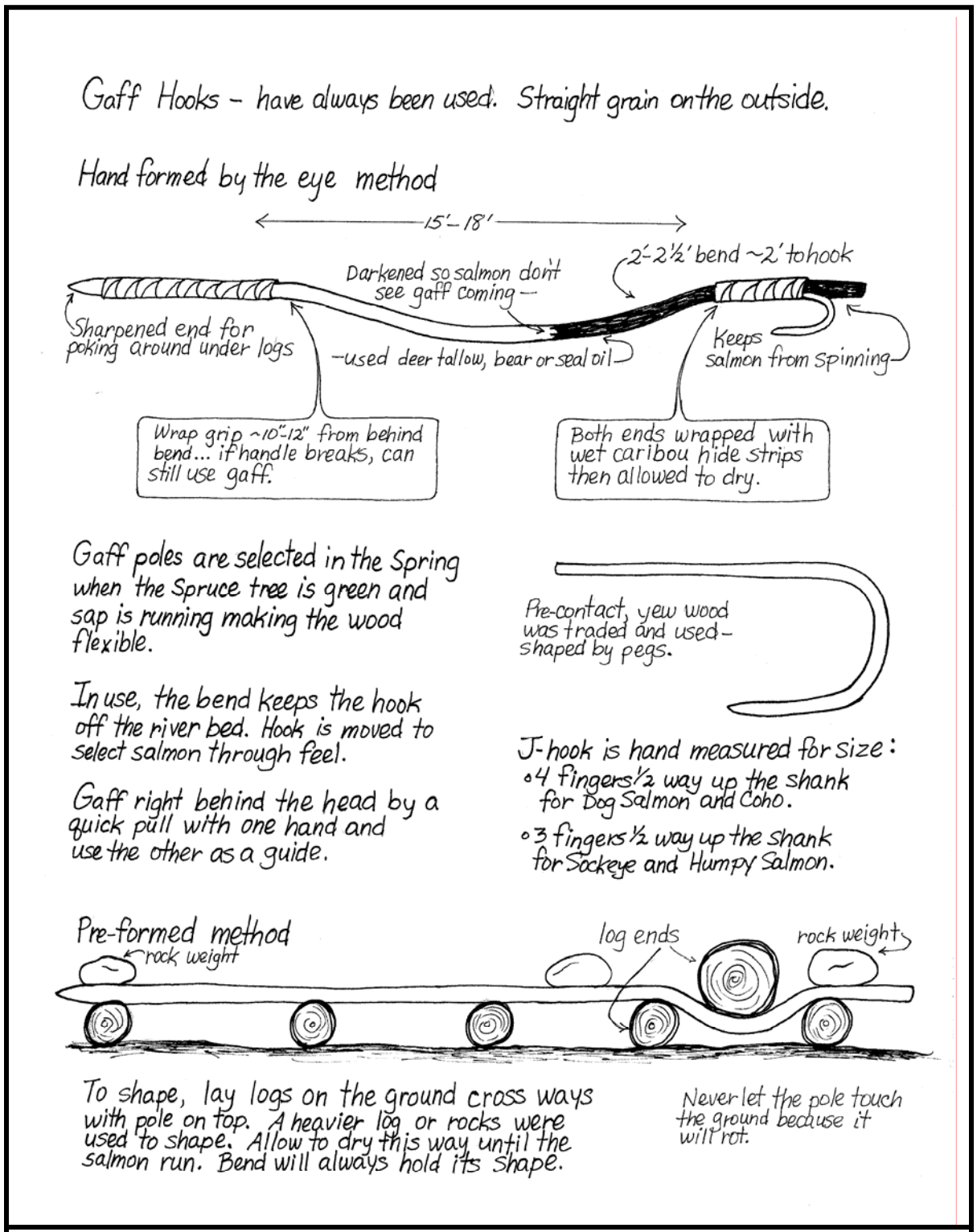


Figure 20 ***Huna*** **gaff construction – composite information from various sources. Sketch by Wanda Culp.**

A number of the Hoonah interviewees reported having different gaffs for different species of salmon. The difference between the two is size and spread of the hook attached to the end of the pole. A smaller hook with a narrow opening is made for gaffing sockeyes and humpies. A larger hook with a wider opening is made for gaffing dogs and cohos. The width of the opening is related to the preferred capturing technique. The point of the gaff ideally impales the salmon at the top of the back in the area between the dorsal fin and the head and penetrates through the fish just below the backbone. Since sockeyes and humpies are smaller fish, the smaller opening will tend to keep the penetration point toward the top of the back. The wider opening for the dogs and cohos is required due to the greater thickness of those fish in that area. Thomas Mills commented that dogs salmon in the Excursion River not uncommonly weigh 12 pounds requiring considerable strength and force to gaff them successfully and then pull then ashore. Here he discusses reasons for the larger hook below:

> *"…it would be longer and the hook itself would be heavier. You want to build a heavier hook for a longer pole because you're essentially reaching way out in the river…Now I am in the process of …manufacturing a gaff hook to use on dog salmon and cohos. It's bigger than the ones we use for sockeyes. And it's got to be a little heavier because…those two fish are fighting fish."* (TM TR:16, 23)

While looking from a distance like the spear, the use of the gaff hook requires a substantially different technique than the spear. Streams consist of numerous different configurations of rocks, gravel, water speed, water depth, water turbulence, slope, and substrate coloration. These factors, among others, establish the manner in which the gaff is used. In many streams and rivers, the most preferred context described (and utilized) by Hoonah users is relatively flat area with a gravel or soil substrate where water moves relatively slowly through a pool that, while deep enough to allow the salmon to swim easily, is not so deep that the fish are difficult to see. A light colored substrate is preferred (see Figure 22 below) so that the specific features of individual salmon, their size, coloration, and form (male or female) can be discerned. Hoonah users perceived these contexts to be locations preferred by salmon as resting areas on the way up the stream to their spawning beds (see discussion of *ish* in IV). Alternatively, if the substrate is gravel, these ponds are likely to be spawning habitat. Fewer rocks, logs and branches

Figure 21 Two gaff hooks used for salmon on Excursion Inlet rivers. Displayed by Thomas Mills.

in these areas are preferred; rocks may damage the gaff hook if struck while the salmon can hide or escape more easily under logs and branches. The fisherman should stay out of the water as much as possible in order not to frighten the salmon. The area where the fish are to be landed should be flat or there should be a holding area nearby to place the captured salmon. They should be killed with a blow to the head upon landing and gutted, in a specific position (see discussion in section IV below), shortly after their capture.

In the preferred environment, the fishermen watches the salmon that are in the pool and selects one that he intends to capture. Even if several salmon are swimming in close proximity, the fisherman can usually identify and make contact with the fish

desired. The method described by users whether in faster or slower moving waters is as follows – identify where the salmon wanted is located; position the gaff in the river beyond and above the identified salmon; let the flow of the water drift the hook until it is immediately above the head of the salmon; then explosively pull the gaff toward yourself, penetrating and impaling the fish through the top just behind the head, and continue to pull toward yourself while rapidly twisting and lifting the pole so that the fish is upside down as it comes ashore. This is hardly as simple as it sounds and the design of the gaff hook bears witness to the uncertainty inherent in the process. Thomas Mills notes:

Figure 22 Thomas Mills using Tlingit gaff hook in the Neva River. Note the light colored stream bottom, the dark salmon swimming and the brown section of the gaff hook for camouflage.

> *"…and it's always bouncing down the river on the rocks and things so its always important on the gaff hook itself to have that angle on the bottom so it will work like a skate rather than just having the hook point plowing into the rocks every time you pulled and missed a fish…"* (TM TR: 16)

While pools of slow moving water are the preferred locations, there are many other contexts in clear streams and rivers. There are tumbling falls, deep holes, and turbulent pools – the gaff could also be deployed in these locations as Figure 23 below indicates how the gaff hook is being held in the pool waiting for a salmon to hit it. Thomas Mills states:

> "*We use the gaff in some places around falls where you only get a glimpse of the fish now and then. Then we fish by feel which is what we have to do when we didn't see what we were doing."* (TM TR:16)

Within *Huna Káawu* and especially in the glacially influenced areas in the vicinity of *Seeti Geeyi* (Glacier Bay – "Bay in place of the glacier"), most rivers were not clear and the glacial fed streams made seeing the salmon extremely difficult.

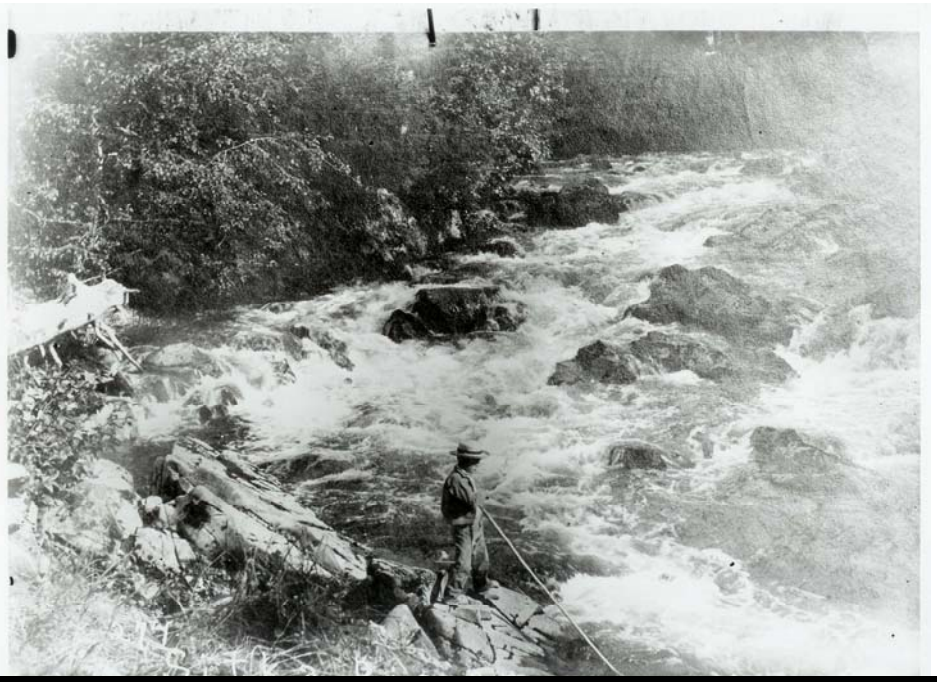


Figure 23 Using the Tlingit gaff in an eddy next to turbulent waters created by high velocity rapids. Photo from Vincent Soboleff collection. Courtesy of the Alaska State Library

"Blind gaffing" is what Ken Grant refers to the practice of obtaining dog salmon from one of these rivers, the Dundas, located in Glacier Bay National Park on the north shore of Icy Strait (KGt TR: 8):

> *"…the water was really silt. Glacial silt. The stream used to be muddy. One couldn't see any fish in the muddy stream. Yet we continued to gaff for the salmon. The gaff hook can find them. As you're moving you could feel the bump from the fish. When our gaff makes contact with a dog salmon, we hook it. You just jerk, and once in a while you get one. After we hooked the large salmon, we ran with it to the shore. "* (KGt TR:3, 8)

As with the spear among the Klawock Tlingit, using the gaff among Hoonah Tlingit was not regarded lightly and a young man had to be trained and skilled before he would be allowed to use it. Charles Jack noted:

> *"You got to get to a certain age before they let you use a gaff hook. You just can't go up and use it. My grandfather used to tell me, 'You're not old enough to handle a gaff hook' even though I was 18 years old. It had to do with being able to drift the gaff down the stream correctly."* (CJ TR:2)

Thomas Mills experienced the following in learning about the gaff hook:

> "*We just watched how they used it before because they said it was a real delicate tool and we couldn't be trusted with them…"* (TM TR:6)

Mr. Mills provides an additional reason why children were not allowed to use gaff hooks in the following:

> *"…[they were] easy to lose and once you lost one it was hard to replace. There were a few people who know how to make them and during the season when everyone was getting their [fish], there wasn't time to make one. Usually you made them in the early spring or you made them in the winter or fall."* (TM TR:6)

Young men both observed and were given special instruction in how to make gaff hooks with careful attention made to the hook itself. Metallurgical skills involving heating, pounding and sharpening iron were Tlingit skills prior to the coming of Euroamericans to this region (Emmons 1991). Thomas Mills describes how "Uncle Pete Duncan" taught him the process of making gaff hooks:

> *"I've made them from just metal rod. Uncle Pete Duncan's the one [who] taught me how to make them. [He]…would take me…down to his shop…and start showing me things. First I'd just watch him, what he was doing on everything and later he started letting me help him keeping the…metal rods in the heat. He would temper, sharpen and temper it."* (TM TR: 7)

While gaff hooks have many similarities, nevertheless everybody has their own unique elements that allow others to distinguish in a glance who the maker of a gaff hook was.

Commentary on spears and gaffs

Are there any reasons why the spear is used by *Hinyaa* (Klawock) Tlingit and the gaff by the *Huna* (Hoonah) Tlingit? No clear, definitive answer was articulated in the interviews, but at least two interviewees had given thought to a comparison between the two. Hoonah elder James Osborne noted:

> *"The people in the Ketchikan area, Kake, their gaff hooks were different from ours. You poke, like a spear. And then…when you get a fish it turns around. …But in the deep water their spear [is like] a stick. Their gaff hook is facing toward it, they're boxed in. You can't get it unless there's no rocks between you and the fish. That's why I don't think they had any pick like we did."* (JO TR: 18)

Mr. Osborne's inference here is that the southern spear is less able to select an individual fish due to its characteristics and might not work as well in deeper pools.

In Klawock, interviewee Theodore Roberts indicated his familiarity with both devices by providing the Tlingit name for the gaff (*kuk dedixaa)* and discussed the ancestry, contexts of use and relative merits of each device. His observations follow:

> "*When they first came out, they just …put the hook on the bottom facing you. Later on, they put it on the top with the line. But the first one, they put it on that way. They called it* 'kook dedixaa'. *I used it…they [Klawock people] preferred that other one later. See you can get the fish you want, the one that satisfies you, you can aim. With the other one, the fish see it…they all take off before you hook it, a lot of the time. The one you put the hook on the other way [on top], you can aim it, you can get any fish you want to get. A lot of times you [the fish] can see a hook coming. Even if you hook it, he's going to take off. When I'm going to throw a spear, I'll get 'em!"* (TR TR:29)

In Hoonah, interviewee Thomas Jack was also familiar with both devices and made the following remarks:

> "*The spear…they used a lot of spears before the gaff. The first thing they used was the spear because they fixed, at the shallow part of the creek, those sticks. They'd run it…half way across the creek. Just high enough to keep the water and the kids would throw rocks in on one side and the fish would go all the way in and when they come up on the shallow [they would spear them]."* (TJ TR:14)

Thomas Jack indicates that the spear was used in conjunction with in stream weirs and therefore were linked to salmon being driven into shallow accessible waters.

Mr. Roberts' comments indicates he believes that the gaff form was the original or older form and that the spear was a newer, innovated form. Mr. Jack, on the other hand, believes that the spear was the initial form with the gaff coming later.

Finally, Mr. Roberts states his belief above that the spear provides for greater precision in the selection of fish and a higher success rate due to not scaring the fish away prior to striking them.

Hoonah interviewee James Osborne, however, thinks differently, on both counts – fish identification and relative success rates, as he observes:

> *"They're not as accurate as we were. See, we could tell the fish apart."* (JO TR:18)

A possible factor relating to the gaff and spear may relate to the relative frequency of turbid, glacial streams between the Hoonah and Klawock areas. In the Hoonah area there are a number of glacial fed streams while all the streams in the Klawock area are typically clear unless at floodwater stage as none of them are glacial fed. The gaff may work better in murky or turbulent waters than the spear and therefore be more useful to *Huna* Tlingit fishermen. The gaff may be more effective in turbulent, high velocity contexts, such as the Chilkoot and Chilkat Rivers, as well. In both cases, where the ability to see salmon is reduced, the gaff maybe superior for fishing by feel.

Implications

Whether a gaff or spear, there is an important implication inherent in the traditional in stream harvest of salmon by Hoonah and Klawock Tlingit. Both allow for the selection of individual fish from the stream and the preferred locations of harvest are where the characteristics of the salmon are discernible. While they may on occasion be used in blind areas of tumbling waters and deep, turbulent pools, in glacial-fed muddy streams, or in areas where large schools make it difficult to identify discrete salmon, the overwhelming use of spears and gaffs as described is in locations where salmon are observable and therefore the characteristics can be discerned and an appropriate fish can be individually selected. This important principle relates to practices concerning productivity of salmon carried out by Tlingit that are discussed later in the report.

III. TLINGIT SOCIETY AND SALMON

Salmon are central to Tlingit society and recognized as a critical being upon whom human beings depend. The centrality of this relationship manifests itself in every strand of the complex tapestry of Tlingit existence. At the heart of the logic of engagement with salmon is the philosophical premise that salmon are "persons", beings like ourselves, who have needs, desires, motivations and thoughts that parallel to a great extent those of human beings. The mythic charter establishing this axiomatic quality of being is found in the Salmon Boy or "Moldy Boy" account universally taught in Tlingit families well into the 20th century (de Laguna 1972, Emmons 1991, Peck 1986, Swanton 1909). Elaboration of the account and its role as mythic charter is presented in section IV.

A basic understanding of the complex social relationships among Tlingit groups concerning salmon includes the elements presented in the table below, each of which will be discussed in the following pages.

Table 4 Tlingit Social Relations concerning Salmon

- Clan/house ownership of streams/fishing sites
- Respect for clan ownership by others
- Defense of streams
- Clan leaders as stream trustees – harvest means, occurrence, location, timing and quantity and life stage controls exercised by trustee
- Accommodation of others needs as requested
- Acquisition of surplus for distribution to others on ceremonial occasions
- Ownership and relationship ritually demonstrated through *at.oow* – clothing, masks, song, dance and other regalia – on ceremonial occasions

A. Clan/house ownership of streams/fishing sites

A core and critical principle which organizes Tlingit social relations is ownership or "property" (de Laguna 1972, Emmons 1991). The clan (*na*) was the primary recognized corporate ownership entity. These named entities were recognized as the "owners" of streams, beaches, forests, franchises, travel routes, and forms of non-corporal property

(crests, names, songs, dances). In some villages, clans were divided into houses (*hit*) which were also named and had a social existence that continued through generations. Contemporary Tlingit recognize this principle – about the Klawock River, *Shunkweidi* elder Theodore Roberts states:

> *"The* Ganaax adi *own this river. It belongs to my wife's family."* (TR TR04)

Klawock elder James Martinez provides this account of stream ownership he learned as a young man:

> S. Langdon – *"Were you told about people who had the authority to make decisions about fishing on different streams?"*
> J. Martinez – *"There are some stories I heard that they owned creeks all over the place, you know. Like the Darrows and the Ketahs [Ganaaxadi clan members] owned this one* [Klawock River]. *They're the ones that owned it."*
> S. Langdon – *"And do you think Minnie* [Johnson] *owned Deweyville?"*
> J. Martinez – *"Oh, yeah. That was their creek."*
> (JM TR: 74)

Among the *Huna* Tlingit, the same understandings exist as stated by Thomas Mills:

> *"My father is* Wooshkeetan. *His clan owned this river [Neva River] and had a village at the mouth."* (TM TR: 4)

There are variations among Tlingit on the theme of clan ownership of fishing sites. In the islands of the Alexander Archipelago, where most streams are short and harvesting practices concentrated primarily at the mouth, the stream and estuary were owned by a clan or house (Olson 1967). Some are named after the clan trustee and a personal clan name links the trustee to the river – examples of this are *Tlawaa* (Klawock) and *Sdeini* (Staney) on Prince of Wales Island. On the mainland, where larger rivers such as the Alsek, Chilkat, Taku, Stikine and Unuk are found, fishing sites or locations, not the entire river, are owned (de Laguna 1972, Oberg 1973). However, certain areas are likely to be associated with distinct clans, houses or lineages. In most cases, several families of clan related and intermarried people would customarily join efforts at a specific location to harvest and process salmon returning to their camp annually.

Further support for the centrality of salmon stream ownership to Tlingit society can be found in the construction of clan names. Clan names have a variety of sources as Thornton (1995, 1997) has demonstrated. In many cases, a clan name is created by appending the suffix *dei* or *adei* to the name of a stream. An example from *Huna kaawu*

is the clan *Chookaneidi* whose ancestral home one of the streams which they owned was *Chookwan heeni,* located in Glacier Bay. An example of this pattern from the *Hinyaa kwaan* is *Gaksheen adi,* a subdivision of the Klawock *Ganaax adi,* who owned and occupied the stream named *Gaks heen* (now referred to as Little Salt Lake) two miles north of Klawock. Among the *Kekc kwaan*, the *Kachadi* own and take their name from *Kach heen*, the name for which in turn is derived from the term for sockeye (red and green) at spawning time.

B. Respect for ownership

Another core principle and value in Tlingit thought and practice is that of respect. In Tlingit, the term *ayut wune* is used to prescribe appropriate behavior among humans and between humans and other beings. In the case at hand, Tlingits are aware of the ownership rights of others and overwhelmingly respect them. One of the ways this is demonstrated is articulated by *Huna* Tlingit, Lily White in the following account:

> *"Like here is* Chookaneidí (Chookaneidi *clan) country.* Yee kaani yaat wukuxu a *[asks permission]* "Tlel gé waasá utí héenyik dax*"? (Is it alright to harvest salmon from your stream?)* "Yak'ei ax kaani, nakux". (*Go ahead.) Get all he wants. Go out.* 'Chookaneidí x'eduwóos'in at kax yeedát kwa, tleik'. *(In early times, permissions to harvest salmon from the streams were formally asked; now that's not done.)* Yei ku gaxdu éex'i tsu, Kaateedi xánt áwé kakdukaaych. *(When the people were preparing for a potlatch, the people went to see Carteeti.) The first town mayor in Hoonah… [Asks permission]*. 'Hel gé waasá utí yeeshukaa haakawahaayí, ax kaani"? *(Is it okay for us to be the first to harvest salmon from your stream?) [Reply]* "T'akdeintaan ts'a yeeshukáx'. *(The Takdeintaan clans has priority)* Yak'ei ax kaaniyan. Kugaay éex' weidek kwagoot". *(That's fine, we'll come there.)* (LW TR: 25-26)

In this account, Mrs. White has used two conversational exchanges to inform us about two periods of previous practice. In the first period, apparently corresponding to practice prior to the establishment of a local city government in Hoonah, a speaker who is not a clan member seeks permission from the clan leader to obtain salmon from the stream he is the trustee over. The clan leader replies positively. In the second conversation, a new authority, the town mayor, is approached about access to streams by a person who is either unaware of clan ownership or is not a member of the clan with jurisdiction. In his reply the mayor, however, describes which clan is responsible in the area inquired about. Note that the mayor does not suggest, guide or order the inquirer to another area, rather

the questioner takes it upon himself to redirect his efforts to a more appropriate area. This is a revealing account including important historical information as well as information about the nature of Tlingit information exchange and practice.

Hoonah interviewee Karl Greenwald reported similarly about ownership practices as follows:

> "*…like I was saying each one [stream in Port Frederick] had two, three smokehouses and if they frowned on you coming, you wouldn't go there. You can [if] they invited you to come. If you ain't, you don't fish our creek. That's the way they felt. Like it was their river. And it was an honor for them to invite you to fish their river. [Invitations were based on] the run and the need. And most of them didn't like you to pick the berries right in their area. And you could understand why."* (KGd TR: 11)

These statements demonstrate the manner in which Tlingit respected the ownership rights of others by staying away from other people's fishing camps unless explicitly invited.

Use of the Klawock River for fishing likewise required permission from the appropriate owner/trustee. James Martinez stated that:

> *"You had to get permission. I know John Darrow* [Klawock *Ganaax adi* leader in the 1930s] *let everybody fish up there because…everybody moved in here. That was because this was the only place they had a government school."* (JM TR: 76)

Knowledge about who owned particular salmon streams and/or sites was well known among the Tlingit of a village or *kwaan* for these were the areas and people with whom interaction occurred on a daily basis. In Hoonah, for example, elders are able to state who owned fish camps on most of the streams in Port Frederick, Excursion Inlet, Glacier Bay and throughout the Icy Strait region. Local knowledge of traditional ownership is somewhat less in Klawock where population decline in the late 19th century led to village consolidation at Klawock between 1905 and 1940.

When traveling into unknown territory, Tlingit would keep a close eye out for petroglyphs along the shoreline for the crest carvings on the rocks in proximity to streams was an indicator of clan ownership. Tom Thornton (2000) visited the main river in Sitkoh Bay with an Angoon *Decitan* elder who showed him the petroglyphs carved by her clan ancestors to announce to others their ownership of the stream. Similarly, a petroglyph in distinctive Tlingit art style depicting a dog salmon is found in Dry Pass on

Kosciusko Island. The dog salmon is the primary crest of the *L'eeneidi* clan and the bays and stream along Dry Pass fall within the traditional territory of that clan (Olson 1967). Thus, another Tlingit party unfamiliar with the area would be informed about whom the owners of the area and streams were.

C. Defense of streams

If an owner's property right to a stream or location was violated by intrusion or unsolicited use, the owners had recourse to violence to protect their property. Such retaliation was widely recognized as legitimate in Tlingit society (de Laguna 1972, Emmons 1991, Olson 1967). While the frequency of such unsanctioned use is difficult to determine, Tlingit sites known as forts (*nu)* are often located in proximity to salmon stream sites.

Klawock elder James Martinez provided the following account of his experience as a young crewman on a fishing boat in the 1940s:

> *"Charlie Jackson…Karheen, belonged to him…the creek at Karheen. I remember we were going to fish there one time, rob the creek at Karheen. I was with FP…we got in there and we were getting ready to make a set when they shot a gun over our head, way up. He said, 'Get out of here!' You know, I never said nothing. I remember FP says 'We had better go, he owns this place'. That was his creek…you had to get permission from him."* (JM TR: 74)

In a similar vein, Theodore Roberts observes in response to a query:

> *"S. Langdon: Did they fight over the fishing streams?*
> *T. Roberts: No, you just.... know who it belongs to. You come up to Nossuk ... you're already a dead man."* (TR TR: 67)

D. Clan leaders as stream trustees

While the corporate, transgenerational clan was the official stream owner, in any generation a specific person had the responsibility for making critical decisions about salmon. In some cases, it appears that a specific clan name is associated with a stream as the ultimate protector and guardian. The name, *Teqahait* (spelled *Takike* on a monument in Klawock) is associated in oral traditions and historic accounts with the Klawock River (Olson 1934). A monument with that name is located in a prominent and visible spot that overlooks the lagoon and mouth of the Klawock River (see Figure 24). That person, in turn, may delegate onsite supervision to another person as will be demonstrated below.

According to Sitka traditional scholar Herman Kitka, the Tlingit term for this person is *Heen saati*, meaning head of the stream(s). This parallels the Tlingit term *Hit saati* meaning head of the house.

In contemporary times, the term "stream guard", taken from federal regulatory practice in the 20th century, has been appropriated and applied to this role among the Klawock Tlingit. For example, Ron Williams Sr. of Klawock stated:

> *"I guess you could call the one guy that was always up the* [Klawock] *river the 'stream guard.' I was told that by Harry Watson, my grandfather and Henry Roberts."* (RW TR: 5)

Similarly Byron Skinna describes the "last stream guard" thusly:

> *"The last stream guard that I know of was* Anniskette, *I forgot his first name but his last name was Anniskette …our streams went all the way to Shakan, Shipley Bay and on this side of Rocky Pass, everything on this side. He took care of a number streams along the way up…those were his streams to watch."* (BS TR: 7)

Mr. Skinna is *L'eeneidei* (Raven dog salmon) and the area he describes generally conforms to the traditional territory of the *Hinyaa* branch of this clan. Further, "Anniskette Point" (presumably named after a Tlingit of that name) sits right in the middle of *L'eeneidei* territory located on the northeast corner of El Capitan Passage just as it turns sharply to the west.

Mr. Skinna provides the following interesting account of conflicting claims to authority over the determination of fishing activities from the first half of the 20th century in the *Hinyaa* area:

> *"He [*Tlingit *stream trustee] already told the boys, okay … this stream's got enough fish, go ahead take everything else now. And then here comes the little guy [federal stream officer] right out there. Starts writing down, 'What's your name? How many of you here? Five of you? I need all your names and we're going to go to court for fishing illegally.' He [*Tlingit *stream trustee] said, 'What are you doing'? He said, 'Well, I'm going to give them a ticket. They're going to go to court. They're fishing illegally.' He said, 'No they're not. I gave them permission to fish. That's why they're here.' And he said, 'Well they have to go to court. I'm appointed the stream officer'. 'No, you're not' - grabbed him, pulled him out of the skiff ... shoved him under until there was no more bubbles ... [Then he said] 'Okay boys, go ahead' - that's all there was to it. When he said it, he really meant it. He didn't say, 'Well, we'll go to court' … no, he was the court."* (BS TR: 6,8)

Figure 24 Monument to *Teqahait* (Takike), Klawock *Gaanaxadi* clan leader and keeper of the Klawock River. The monument overlooks the Klawock River estuary and lagoon (background) from on top of Chuck Island. The arrow points to its placement. The first cannery established in Alaska in 1878 was located to the right of the large tree. Takike was instrumental in asserting and protecting Tlingit ownership of the river.

As Klawock interviewee Byron Skinna noted, appointment as a Tlingit stream guard was not random or mechanical but was a function of experience and knowledge:

> *"... they designated him boss because he knew the streams, he knew how much fish it took to reproduce …so you don't get overkill [overescapement] up the streams."* (BS TR: 6)

In addition to their responsibilities for defending the stream against illegal interlopers and making decisions about fishing activities, clan leaders and their designees served as trustees over the stream and "took care" of their streams. Thomas Jack provides the following statement about this practice:

> *"…each one of these creeks that were around, all designated to a certain family and that's what they all do, they all take care of the creek and that's how you take care of it. They don't just sit there and watch it…like those houses [points out the window to smokehouses at the mouth of* Gaat heeni *opposite Hoonah] over here are still there, those guys were in charge of this creek and then go over to Humpy Creek…used to be three [smoke]houses over there…and that's how they did it. I used to see each one of the salmon streams around that had smokehouses by them. And it was the families' job to take care of that creek…it was the same every year.* ***The one that took the best care of their creek had the best fish return of them all."*** [Emphasis added] (TJ TR:12)

The activities that constituted taking care of a stream are discussed later in the report.

Clan leaders or their designees as trustees made decisions about the following matters related to salmon utilization:

Harvest means – clan leaders supervised preparation of technologies for the return of the salmon. This would include inventory of items such as weirs and traps, coordination of repairs and decisions about new constructions. If a stream had several different fishing locations, separate sites may have come under the supervision of house leaders or lineage leaders (SH TR). According to Christine Edenso [deceased Klawock *L'eeneidi* clan member], prior to the 20th century, each spring clan leaders sent their slaves out to the fishing sites to repair fences and weirs and prepare them for the arrival of the salmon (Pulu 1983). The same would be done with basket traps that would be placed in the weirs and fences.

Harvest onset - clan leaders made determinations concerning the time when people should go out and prepare the technologies and when they could begin harvesting. Ron Williams comments of the "stream guard":

> *"He would be up there and he would let others know when it was time to go up and get fish."* (RW TR: 5)

Mr. Skinna discusses the last "stream guard" *Anniskette's* authority in the following:

> "*He took care of a number of streams along the way up…and when they had enough when he said, they had enough fish to fish it, then you could go and fish. But you had to check with him before you went any place to catch fish because he told you whether there was enough fish in there to warrant catching fish in there or not."* (BS TR: 7)

When they went to *Sar kar*, also called "Deweyville", Mr. Skinna states:

> *"They always asked permission…It was Mrs. Johnson at the time."* (BS TR: 7)

Designated trustees also determined when the people should welcome the salmon on their return. According to Klawock elder Clara Peratrovitch (1986), traditionally the members of the clan would congregate at the site with their blankets to sing and dance as the salmon appeared, jumping in the bay. In another interview, Mrs. Peratrovitch noted that children sang songs inviting the salmon to jump on the sharpened stacks that their family had placed in the intertidal zone (CP TR01).

Stock assessment In certain years, failure or low numbers of salmon returning to a stream would lead the clan leader eschew fishing at that location. Huna *Wooshkeetaan* elder Sam Hanlon provides the following description of stream stock assessment:

> *"We started at Mud Bay first. It's the first start. And this is what you call conservation today. And our* Tlingit *people practice that long before. The old man used to walk up…he walked up the river. When there were a lot of salmon, they would take what they need, no more. Idaho Inlet, same thing over there. He checks it out first. The amount of the salmon harvested from the stream depends on their availability. But you check the river out first. The first one* [goes] *up in the river to check how much escapement was there. If there's not enough, they don't bother. Then they would leave it alone, go someplace else."*

He goes on further to note:

> "*And in the river, there's always a big pocket of deep area. That's the deep part of the water. So when they look...down into that deep water, you could see them laying their eggs in the deep so seagulls don't feed on it. That's the spot they closely observe. They don't approach harvesting in an unplanned manner."* (SH TR: 14)

This is an important statement linking decisions to harvest with traditional Tlingit stock abundance assessment methods. The leader goes up the river and finds the "big pocket of deep" to see what is occurring there. In that location, he could observe the salmon laying eggs. The clear inferences from this account are that:

1) substantial quantities of salmon have already moved out of the estuary up the stream and, given abundance in the hole, likely a portion of the run has moved above the hole to upstream spawning areas; and
2) actual spawning behavior in the "deep" indicates that they are not just abundantly present but rather have moved into spawning mode, which requires some additional time in stream to prepare the nests.

Mr. Hanlon elsewhere remarks that the hole should have an abundance of salmon for harvesting to begin. The upshot of these practices was to insure that the early portion of the run ascended the stream without human harvest or obstruction.

James Osborne's recollections echo Mr. Hanlon:

> *"…when spring time comes around we were taught what kind of fish to take. Certain time of the year we make sure there's lot of fish in the creek before we get our food. More than enough. We just didn't take the first ones that came. That's why we had fish all the time."* (JO TR: 4)

In a similar but more general vein Charles Jack states:

> *"Okay. If Crab Bay don't have any…don't have enough cohos …we go to Salt Creek. It's on the other side. For centuries, my family subsisted out of Crab Bay. If the fish is not there, then they just took what they figure they can get by with. They leave, like say there's a hundred cohoes in there. All along you take two cohoes, because there's not enough cohos…"* (CJ TR: 7)

Location – The locations for salmon capture were also specified or determined by the clan leaders. For pink and dog salmon, the primary locations were in the estuary and extreme lower portions of the streams or rivers. Hoonah interviewee Thomas Jack noted:

> *"We'd gaff our fish there ... when we went for dog salmon and humpies ... always below the first hole. I asked him [grandfather], 'How come? There's lots up there?' He said, 'No'; he said, ' They're getting to…their home'.* (TJ TR: 42)

For sockeyes and cohos, locations would vary due to the different sections within the stream where the salmon occurred and the later spawning times exhibited by these two species. Harvest locations could range from estuaries to in stream spots to post-spawning locations. In the case of king salmon, and also cohos, technologies for saltwater harvesting were also deployed by some Tlingits.

Timing – As noted in Mr. Hanlon and Mr. Osborne's remarks above, there was a general pattern that was followed in which the temporality of the runs dictated the time to be in certain locations to obtain certain species. The overall circuit and the timing of the movement from one stream to another were a function of a variety of factors. A critical one was the appearance of the salmon. In some cases, co-occurrence of other seasonal events was used as a marker of timing – several sources referred to fireweed as an indicator. In Hoonah, Frank O. Williams said that when fireweed began to show the white strands toward August, his grandfather would stop commercial seining and go to Point Carolus or Dundas Bay to begin putting up salmon for the winter (FW TR). In Klawock, Theodore and Alicia Roberts gave slightly different versions of how fireweed was interpreted by their parents. Alicia Roberts stated:

> *"Each year my mother said that fireweed, when it's all in full bloom, it's the last of the fish run. I used to hear my mother say all the blooms now, the fish are closing now. She used to talk in* Tlingit **– *Gaadwa'a*** *'that's it; they're all in…coming in'. That's the end of the fish run."* (TR TR: 56)

In contrast, Theodore Roberts, Alicia's husband, remembered:

"*Fireweed blooms are at the beginning of the main run. August. That's all I know about fireweed. It's at the beginning of the run – it blooms in August."* (TR TR: 57)

In Hoonah, the appearance of certain berries determined when it was appropriate to go to the stream for a certain species. For dog salmon, Charles Jack recalls:

> "*…the* Tlingit*s know…they look out there. 'Hey, I see salmonberry blossom, I think I'll go up the river and gaff a fish.' That's how they know. I know my Grandfather used to watch and look at the salmonberry bushes all the time.* 'Heen yik aawe teel, a yug a.' (*The dog salmon are in the river.)* (CJ TR: 29)

And for cohos, Mr. Jack indicates:

> *"I think on the coho, they use that neigoon…When the neigoon is blossoming that way you go check for cohoes up the stream."* (CJ TR:30)

There are likely many other indicators used by different Tlingit kwaans and clans that are appropriate for the geographic region, species and run timing.

Quantity - Two primary principles of human use are the foundation of the expression of respect for salmon characteristic of Tlingit society. The first of these is not to waste anything. If it is taken it must be used. The admonition to use everything was a powerful one in Tlingit society as Lily White indicates:

> *"They used every part. They found use for it. I used to just get so shocked when my mom and dad* [were] *telling me, you know. My mom said, 'Long ago, we not only ate the salmon. They were used for many things. Nothing was wasted.' All the uses they found for it. The bones and back bones of the large salmon the women used them for combs. The salmon tails were also tied together. When the salmon tails dried, they were like plastic. Those were used as brooms…they swept dirt with it. Even the slime. They made it for masks …paste."* (LW TR:18-19)

Klawock elder Clara Peratrovitch conveys a similar sentiment but couched in a slightly different manner:

> *"…all this waste of fish that's on the beach, in the old days, you would never see that. Regardless of whether you need it, you can put it aside, fix it up, and in the winter somebody may need something, you can be generous and give them."* (CP TR: 48)

Waste might also result from failure to utilize time-honored and tested procedures for handling fish as the following remark by Charles Jack describes:

> *"When you handle the fish,* du gook na<u>x</u> awe at gax yeeyaa (*You carry it by holding the ear part of the head).* Tlel ud gutl nuch. I ya gutli.aa aas gugaloox'.

(*You don't squeeze the salmon.) The fish meat will come off. That's why* du gook na<u>x</u> *(by the salmon ear).* (CJ TR: 3)

The second principle related to respect was to take only what was needed. Sam Hanlon reiterated this on several occasions during his interview:

> *"One of the things our* Tlingit *people practiced…We took only what we needed and no more."* (SH TR: 31)

Respect was also shown for salmon in the manner in which they were spoken to at the time of arrival and capture. Other aspects of respect being shown to salmon people are discussed elsewhere in the report.

Violation of the principles of respect, no waste and limiting harvest, brought sanctions and reprisals in various forms. The most critical was that such disrespect would result in salmon not returning. Clara Peratrovitch indicated the following as the outcome of disrespectful treatment:

> *"Because if you mistreat the salmon, or anything…but especially the salmon people,* [they] *rebel, they take their people back out and they never return. If you mistreat that salmon, you're never going to have a full return the following year."* (CP TR: 28)

Young people were exposed to these principles through observation, demonstration and teaching, in considerable part through the Salmon Boy and Fog Woman mythic charters taught to them from their early childhood. Even with this continuous exposure, occasionally inappropriate behaviors might occur as the Salmon Boy myth demonstrates. The following account provided by Thomas Mills is a more dramatic case in which exposure to attitudes toward salmon exhibited by non-Tlingit prompted an egregious exhibition of disrespect by the Mills children:

> *"One time my brothers and I went up the lake, up the river and lake with clubs and just clubbed maybe 200, 300 of those sockeyes. And being kids we were just going to leave them there. And father got a hold of what we did. And he took us all up there and we stayed up there and brought them all, all the fish down to the mouth of the river. We had to gut 'em all and pack 'em all in pack sacks. He wouldn't even, he was so mad at us, he wanted to teach us a lesson so he wouldn't let us put the fish in a skiff and take it over to the landing. We had to walk the trail and carry it all the way back down and come back up until all the fish was brought down. But that was a hard lesson on us but we learned not to go up there and just slaughter them, just for nothing. Because they are up there for a purpose too, to spawn and keep the resource coming. And we were just young and foolish and we didn't understand all that stuff. The way father did it to us, we thought we*

learned our lesson real quick and we never, ever repeated it. Least ways I haven't." (TM TR: 42-43)

Klawock interviewee James Martinez recalls a similar experience early in his life when the Salmon boy myth was modified for the circumstances by his mother in an effort to teach him a lesson:

> *"One time ... I was down at the creek and ...at* Karheen *... I was throwing rocks at the fish .. and trying to kill them, you know ... and ... she saw me and ... called [to] stop me and she called me up to the house you know, and she said, you know, ... it's bad to do that ... she said that's what we eat ... you know? That's what ... keeps us going ... and I thought about it you know, and she finally told me a story, you know that ... the story was that, a young, some young Native boy was killing the fish and laughing and ... and throwing them around in the creek and ... and ... she said that she knew that his mother ... told him that it was no good to do that ... some day they will come after you. I listened to that and got kind of interested, you know. And she says that ... during that time, he was, went out someplace and ... he fell overboard ... had a ... he disappeared ... nobody could find him ... and ... it was years when ... the old man was down the river ... and he speared a fish ... and speared this one fish ... brought it home, it was big ... and ... he cleaned it and put it up on the rafter ... so nothing would get it ... and ... when they went to bed ... they were laying there ... and ... this fish started flopping around ... you know, and he said, I thought that fish was dead, and so he got up and got the fish ... and ... took it out and he was going to head it so it would die ... and while he was heading it the beads that that kid had around his neck when he disappeared, was in the inside of the skin of that fish. And he came in and told his wife ... and they took it out ... and laid it on a piece of red cedar .... and ... when they finally, morning finally came when they got out there ... that fish was no longer a fish but the boy ... so that's the story I heard, you know? Kind of made me think about what I was doing, you know? I didn't want that to happen to me so ... I quit killing fish ... or playing with them in the river ... and ... I started treating things with respect.* (JM TR: 8)

E. Accommodating Needs of Others

In Tlingit society, the network of relationships established by marriage and descent, created a substantial degree of obligation. In-laws and those from the clans of grandparents could basically not be denied access to salmon by a stream owner. In addition, there were formal ways for obtaining an invitation, however. Richard Dalton Sr., *T'akdeintaan* house leader indicated that when his grandfather wished to use locations in Glacier Bay to obtain certain resources, the party would travel to *Chookenheeni* where they would formally announce themselves from their canoes offshore of the village and await invitation to land. Then, they would formally present

themselves to their brothers-in-law and discuss their circumstances and indicate their desires. The clan owners, while granting access, might issue instructions or provide a guide as Tlingit owners were legally responsible for those who entered onto their properties and wanted no one injured. Olson (1967) suggests that typically clan "owners" were obligated to honor requests presented to them in a respectful manner.

F. Acquisition of Surplus for Ceremonial Distribution

The concept of "need" requires elaboration in that what was needed might vary from one year to the next and was therefore responsive to social context and cultural institutions. The reason for this depended on variations and special circumstances or events that occurred in Tlingit society. According to *Huna T'akdeintaan* interviewee Karl Greenwald (KGd TR:12), a normal surplus was taken to cover expected occasions of giving over the course of the winter season. Surpluses over house needs might also be taken in order to trade with other locals for products from their streams as variations in flavor, texture and oiliness as sources of variety or personal taste contributed to houses in a community making exchanges among themselves.

> "*We were doing a lot of humpies and dogs; they don't get them over there [referring to* Tlingits *on the Neva River]. Wintertime, when they come into Hoonah that's when the bartering and the trade... We'd get sockeye, you know, trade. It was just a taste. Just to say 'Hey, I have sockeye.' They were all good. It was just a matter of barter."* (KGd TR:19)

Above and beyond "normal surplus", there may be extraordinary events that require considerably greater quantities of salmon to be obtained. Thomas Mills supplies the following production inventory associated with the "party" *(koo'ex)* given in honor of his great uncle, "Shorty" Wilson:

> *"We collected about 2500 newspaper style sockeye about 2500 newspaper style dog salmon and about 2500 newspaper style silver salmon and that wasn't counting all the half dried, all the half dried fish and then the smoke strips and the dried halibut and I would say thousands of jars, quart jars of berries we picked but when they had the last big party, the pay off party for Uncle Frank and Uncle Shorty, I think it lasted five days straight."* (TM TR: 18)

This extreme event required an enormous expenditure of effort as Mr. Mills describes:

> "*I would say almost 5 times as much [as usual] because it was all grandmother's effort on processing all that fish. We're just the ones who brought the raw*

supplies to her. And she just, her and Aunt Sue and my mother, Catherine Mills, did the work on putting up all the fish." (TM TR: 18)

G. Ownership and relationship ritually demonstrated through *at.oow*

Crucial aspects of Tlingit social relations are demonstrated and reproduced through the mechanisms of ceremonial institutions. Tlingit clans often identify themselves at the present time based on the primary crest of the clan. The most frequent, and therefore inferentially the most important for Tlingit society in general, clan crest is one of the salmon species. Four of the five salmon species are primary crests of clans and king salmon, the only non-primary crest salmon species is a secondary, house level crest of the *T'akdeintaan.* Thus a person of the *L'eeneidei* clan might refer to themselves as a "Raven Dog Salmon" conveying in that statement their matrilineally based membership in the Raven moiety and the Dog Salmon segments of Tlingit society.

The collective property of a Tlingit clan and/or house group is known as *at.oow*. *At'oow* represent accounts of events in the clan/house history through which a special, proprietary relation was established with a location or entity. These accounts are usually physically represented through hats, tunics, and blankets. Such items are publicly displayed only on ceremonial occasions when the clan presents itself to other clans and reiterates its history and holdings.

The clan then is socially mapped in part through the crests that it has obtained that represent the acquisition of a location and responsibility for its productivity. An example of a clan blanket representing clan *at.oow* is presented below. The design of the *Kachadi* clan *at.oow* is associated with 1) a specific stream, 2) an account of the presence of a being in the stream (woman's face) and 3) the sockeye salmon that inhabit the stream. Further discussion of how *at.oow* objects such a blankets, hats and other forms of art function in *Tlingit* relations directly with salmon are provided in the next section under the heading of engagement.

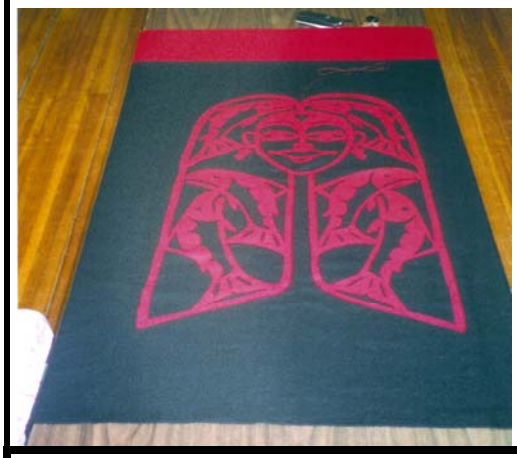


Figure 25 *Kachadi* clan crest blanket being made in Klawock ANB Hall.

IV. Tlingit Relations with Salmon

This section discusses information provided by the interviewees on relations with salmon organized under the topical headings of engagement, protection, productivity and *ish*.

A. Engagement

In order to accurately convey the Tlingit conception of their relationship with salmon, this report uses the term "engagement" rather than "management." This is fundamental to understanding as the philosophical paradigms implicated by these two terms are quite distinct. In contemporary life, humans "engage" with other humans in their daily lives. The best human quality is to respect the autonomy and intelligence of other human beings with whom we interact by authentic presentation of ourselves in a forthright and honest manner that is informed by and attentive to the nature and concerns of others. Only the most cynical and manipulative contemporary humans consciously and overtly claim that they are "managing" other human beings through their interactions with them. "Management" in present discourse and understanding is usually reserved for beings and entities to whom one has to give little thought concerning their desires and interests and can manipulate them as deemed necessary. "Natural resources", even if renewable, are merely entities eligible for management, not engagement, in Western scientific discourse and practice.

In order to further clarify this terminological distinction and its meaning for Tlingit in their relations with salmon, consider the following statement written by the dean of academic studies of Tlingit groups, Frederica de Laguna, in 2001:

> "In explaining the Native ways of thinking about territorial rights, fishing and all other matters…Give up the jargon of 'resource management'. The Tlingit…felt that they were living in one world with the plants and animals and fish. The Tlingit thought of these too as like people with intelligence and moral values. They did not think that these were resources to be 'managed'. They felt that they should treat the fish and game and plants that they took with the respect that one person would give another because they believed that the animals permitted human beings to use their bodies provided they treated them with respect and were not wasteful."

During the conduct of the interviews that are the basis for the information provided in this report, Hoonah elder James Osborne emphatically stated this philosophical grounding as follows:

> "*You have to understand that we treat salmon like we would like to be treated."* (JO PC)

The metes and bounds of this pithy admonishment and recognition of its enormous and continuing philosophical significance continue to impress me. For indeed, Mr. Osborne and other Tlingits whose behavior is informed by these beliefs and their accompanying practice, demonstrate "the true method of philosophical construction" as described by Alfred North Whitehead (1978:xiv), one of Western philosophy's most respected 20th century figures, in the following statement:

> "…the true method of philosophical construction is to frame a scheme of ideas, the best that one can, and unflinchingly explore the interpretation of experience in terms of that scheme."

It is in this spirit of philosophy that this section undertakes to explore what "engagement" means in Tlingit practice with salmon. Only a glimpse of the breadth and width of how the philosophy of "engaging with other persons" (salmon) permeates Tlingit practice can be offered. Further exploration of it can be found in other materials about Tlingit.

A universal feature of human cultures is a set of cosmological beliefs and accounts about the nature of being, beings, the universe and the forces by which these various elements function together. Origins of these forms and their various interactions is another of the key elements in a cosmological system. Cosmological traditions are codified to a greater or lesser extent in relatively consistent traditions known as myths (Leeming 2002). Some myths deal with fundamental principles of being and behavior and provide guidelines and instructions for humans to follow. In some cases, the consequences of not following the actions stipulated in the myth are also illuminated. Such cosmological traditions are here termed "mythic charters" because they articulate the means by which existence and the beings that occupy existence must act in order for relations of existence to persist.

The Tlingit have such a mythic charter of relations concerning salmon. It is known by various names one of which "Moldy Boy" (Swanton 1909). The Swanton version has recently been updated and aligned with contemporary Tlingit orthography through the Alaska Native Rural Systemic (http//www.ankn.uaf.edu/seatc). Other versions can be found in De Laguna (1972) and Peck (1986). At present it is known

usually as the *Aakwatatseen* story or the Salmon Boy story. While there are various versions of the myth it has certain core features that are invariant. For purposes of the discussion here, the fundamental elements of the myth that are essential to understand how it informs the world view and activities of Tlingit are presented below.

How does this mythic charter "work" in the lives of the Tlingit interviewees? In an attempt to call forth the Tlingit narrative structure, interviews were opened with the following query – "What were you taught as a boy/girl about salmon?" Often a version of the Salmon Boy myth was given in reply and it was described as having been formally taught to them. In some cases, it was taught when the child had engaged in a disrespectful act toward salmon. In some interviews, the myth was elicited later in the interview after other topics were covered. Only a very few of the interviewees had never been told a version of the mythic charter during their youth.

Table 5 Tlingit Mythic Charter with Salmon – Salmon Boy

The story is about a young boy who is hungry and asks his mother for some food. She directs him to the remaining small amount of dried salmon. The piece he gets has mold on it and he throws it down in disgust. He is reprimanded by his mother for his behavior. He leaves the house, wearing a copper necklace, and goes down to the beach. He falls into the water but is saved from drowning by the salmon people who take him to live with them in their village at the bottom of the ocean. There the boy sees that salmon are people and is taught many things about how to treat salmon by the salmon chief. Finally, the salmon chief tells the salmon people to get in their canoes as it is time to return to their streams. As they are approaching the stream, the chief tells salmon boy to stand up in the canoe to see where they are. He stands up but in actuality, because he was a salmon, he was jumping out of the water. He noticed his parents on the bank at their fish camp. Salmon boy proceeded up the estuary to where his mother was processing other salmon. She noticed the beautiful fish presenting itself to her and told her husband to come and catch it. So he speared Salmon Boy and handed him to his wife. She began to cut the head off at the gills but then noticed the copper necklace. She recalled that this was what her son had been wearing when he disappeared and called her husband. They asked a shaman what they should do. He told them to lay the salmon on a plank and place it high up in the house overnight. This they did. The next morning, Salmon Boy came down and greeted his parents who were amazed and overjoyed to see him. They asked what had happened to him and so he told them of his experiences and what he had been taught. He then taught the other humans how to respect salmon and how to place all the bones in the fire so the salmon could be regenerated. He became a powerful shaman.

Lessons learned as children, and repeated on many occasions, are typically the ones recalled in adulthood. This is especially true if children, in addition to hearing the myth, observe adult behaviors that are informed by the myth. This is one way that the Salmon Boy mythic charter worked in Tlingit society. From the mythic charter a number of lessons are learned about salmon and a number of specific actions that Tlingit must

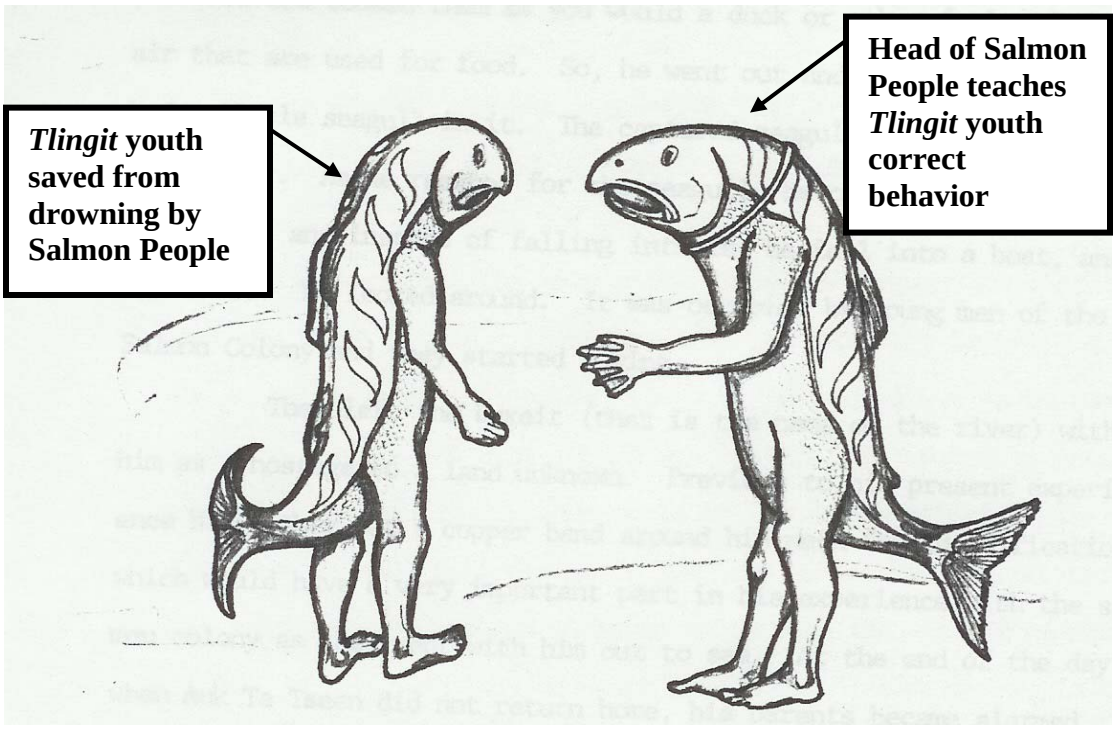


Figure 26 *Aakwatatseen,* Salmon Boy mythic figure, being taught how to respect salmon people by the head salmon. Source: Peck 1986

take to insure the return of salmon people are emphasized. A number of additional actions have also been derived from the charter related to how Tlingit treat each other. Table 6 presents various implications of the Salmon Boy mythic charter in Tlingit life.

From the mythic charter, Tlingit learn that salmon are:

- persons – models of interacting in appropriate ways toward humans apply;
- sentient – they acquire information through their senses and feel pain, hurt, fear, joy and other emotions as humans do;
- volitional – they make choices and decide what they will and will not do;
- attentive and relational – they monitor human behavior to see how humans conduct themselves and behave in a communicative manner;
- require respect – have a sense of dignity and honor that demands respect;
- reincarnation – will not return if not respected and ritually acted upon.

Table 6 Tlingit Mythic Charter:

Concepts, Principles and Sacred Ritual Action

Concepts	**Principles**
• **Persons** • **Sentient** • **Volitional** • **Dignified – require respect** • **Attentive – observe human acts** • **Return is dependent on human action – respect and ritual**	• **Handle with care** • **Kill so spirit can travel to spawning grounds** • **Take only what is needed** • **Utilize all – no waste** • **Do not make fun or speak of badly** • **Do not play with fish** • **Share with others**

Sacred Ritual Action

- **Human consumers must return bones to river or to fire after ritual consumption of first salmon.**
- **Ritual act returning bones is necessary in order for salmon to return to underwater home and be reincarnated.**

With these concepts, Tlingit constructed principles of behavior toward salmon that are articulated in the interviewees as the following illustrations demonstrate.

General abuse of salmon was prohibited and if practiced, had devastating consequences as James Osborne observes:

> *"When you mistreat anything, that's* Tlingit *people's [belief], it will never come to you again. You'll be unlucky all the time. That's why we were so careful in the way we preserved the fish for food. We never threw it away."* (JO TR: 6)

For Mr. Osborne, throwing preserved fish away was a form of mistreatment and this follows directly from the Salmon Boy mythic charter.

In regard to handling of salmon when, Charles Jack gives the following account:

> *"I know a friend of mine, we went up Bear Creek one time to get dog salmon. He had his boys with him, and I told him, 'Okay, boys, you guys can handle all your dad's dog salmon. Hands off on mine'. And my brother told them, 'Hands off on ours'. Because we know they're going to throw rocks and kick it and all that, you know. I tried to tell my buddy that, and he wouldn't listen. So that evening, when he split his…dog salmon while his aunt split it for him and set it up, and he called me over, 'Hey Charles, look at my dry fish'. All the meat was peeling off. 'How come that happened'? 'Because I told you guys not to handle the fish rough'.* Tlingit*s always say,* 'Tlel du gwal nuch'*, ('You don't squeeze your fish'). When you squeeze it, that's when the meat breaks loose from the skin and it's hard to*

> *dry. You know, that's the main object. So when you make dry fish, the meat don't peel off when you get it in the smokehouse."* (CJ TR: 57)

Even at the point of capture, appropriate handling must occur, as Charles Jack states:

> *" …we try to kill the cohos before we take them, you know, like we beat them on the head. 'Cause…we don't want them flopping around and bruising the meat."* (CJ TR: 56)

It is important to dispatch the salmon as quickly as possible to minimize damage to the meat following which they must be gently handled and carried in the appropriate manner as described elsewhere in the report.

Thomas Mills noted that careful harvesting was emphasized:

> *"It was natural for us anyway as we didn't want to bring a part of the head or [a fish with] five, six gaff holes in it home."* (TM TR: 35)

It is also important how the salmon is positioned when it is killed. This practice relates to how it becomes possible for the salmon spirit to be reincarnated as well as to the salmon's ability to remain connected to its social group despite its death. Thomas Mills observes:

> "*When we first get the fish and everything we always had the head and stuff pointed up river and that's [what] we were always told - to have the body facing up river before you cut the head off and that way you were assuring the fish's spirit continue going up river with the rest of the fish. We do that every time we do have salmon."* (TM TR: 4-5)

A related observation concerning the positioning of salmon in the smokehouse is provided by Thomas Jack as follows:

> *"You always aim the fish up, up to, up ... whatever ways up ... whatever, anything that's up, whether it's north is up, but always upstream ... like that ... we're sittin' here, we put our fish up this way ... Yeah, that's the spirit of the fish, it will always know its way down. It will always come back to you ... so, we always do that."* (TJ TR: 20)

These practices concerning the direction of travel of the fish spirit and its ability to return to this world is similar to Tlingit models of death, cremation, spirit travel and reincarnation for human beings as discussed at length in Kan (1989). This follows directly from the belief that salmon people are like human people.

The next principle following from Salmon Boy concepts was to take only what was needed. Tlingit interviewees were enjoined against wantonly harvesting and such a

show of disrespect was severely frowned upon and subject to comment and even punishment. Virtually all of the interviewees made comments about this principle of salmon use. For example, Thomas Jack states:

> *"My father and grandfather said….you just take what you need."* (TJ TR: 18)

Another principle was not to waste any of the salmon that was taken. Lily White observes:

> "*My mom said,* 'Hel ch'as tuxaayin áwé, sík, cháakw.*' (Long ago, we not only ate the salmon.) Ch'al ldakat át áwé átx nateejin. (They were used for many things.)* Hel daasa yoox dugéex'in. *(Nothing was wasted.)'* (LW TR: 18)

Thomas Jack observes:

> *"That's the way my dad always told us ... kind of got mad about it ... if you're going to take something ... don't waste it, don't throw it away"* (TJ TR: 18)

Thomas Mills indicates what his grandmother emphasized:

> *"Mostly it's not to waste it. She.. just made it simple – don't waste any of it. Bring it home."* (TM TR: 35)

James Osborne notes of his training:

> *"Alright, this is…this is where my knowledge came from. Not to waste. We never walked away or we never threw the insides of the salmon."* (JO TR: 6)

In Klawock, interviewees expressed similar sentiments. Clara Peratrovitch observes:

> *"For instance all this waste of fish that's on the beach ... in the old days, you would never see that."* (CP TR: 28)

Elsehwere, Mrs. Peratrovitch continues:

> *"the humpies ... were never wasted ... any part of the fish no matter what kind of fish we got ... our Native people along the way,[had] hard times ... things were very hard in those days so we never wasted any fish."* (CP TR: 4)

Lily White provided additional information on Tlingit uses of various parts of the salmon for nonfood products demonstrating full usage of salmon – see the table presented on the next page.

Table 7 Tlingit Non-food Uses of Salmon

TLINGIT TERM	REFERENT	USE
Teiyi	Fish guts – black part	Black coloring
Kahaakw	Salmon eggs	Pink coloring
Xeeli'	Slime	Adhesive for masks "stronger than paste"
S'aak	Bones (rib)	Needles, awl
T'ix' s'aagi	Backbone	Comb
Xaat eexi	Salmon oil	Cooking, lubricant
Akoowu	Salmon tail	Tied together for brooms

Source: Lily White TR: 8-9

SPEAKING

As persons, salmon are able to hear and observe human behavior. Strongly prohibited as reported by Tlingit interviewees was "speaking badly" of salmon or other living things. This prohibition is clearly evident in the Salmon Boy myth as *Aakwatatseen* disdain for moldy salmon was immediately reprimanded by his mother. A similar clear message is provided in the Fog Woman myth in which Raven expresses frustration with a small piece of dried salmon and thereby loses all the stored salmon, provided through the efforts of Fog Woman, through his display of disrespect:

> *"So, when he ... mistreated that salmon, she [Fog Woman – his wife] became a fog ... he couldn't get her back ... the fish spirit ... fog woman made all the fish come back."* (CP TR: 39)

Clara Peratrovitch makes this prohibition explicit in the following:

> *"... to show respect to anything living thing ... because everything even the trees ... have spirits ... the flying birds ... anything that looks funny ... you don't laugh at ... because the spirits turns on you and presents a bad luck on you."* (CP TR: 28)

Mrs. Peratrovitch makes it clear that violation of this principle has consequences - bad luck for the person who is so irresponsible as to be disrespectful.

Some of the ceremonial speech to salmon reported is couched in a different spiritual context such that thanks are directed to a Christian God as opposed to the fish "person" or its spirit. Clara Peratrovitch describes her parents activities at the start of fishing that appear to integrate the two systems of spiritual belief:

> *"My parents used to fish right along shore ... just the beach seine, you pull it in ... and ... sometimes we'd have one set ... and it's plenty enough . When we'd bring it [first salmon] down, my dad would dig up a hole and make fire while my mom was cleaning it and ... while they were cleaning it, my dad, my mom and dad would sing away ... it was very interesting ... we lived, you know, across the bay ... at the point and ... I was just small little girl and all I could do is just watch, but I always carried the fish to help them ... but the interesting part was while they were cutting the fish, the salmon and their baking it... and [getting the other salmon] ready to hang, they'd stop and eat ... and part of the first fish [they were] thanking the Lord for providing what we catch it up at the stream; at the mouth of the creek, we always prayed. In their language.* Tlingit naa ... a<u>x</u> kaas adaagnageen <u>x</u>wat ageeduweetee daagaan kaawooch ... *that's all, they thanked the Lord for providing the salmon."* (CP TR: 3-4)

SHARING

Many interviewees indicated that it was not uncommon to harvest and process additional salmon to give to guests. Sharing of salmon was a crucial aspect of generosity and hospitality. Thomas Jack observed that his grandfather told them:

> "*If you can't eat it, if you can't use it up ... give it to somebody else*." (TJ TR: 29)

Charles Jack noted that his grandfather set aside certain foods for guests:

> *"We'd make four stacks. Two stacks is the special one. The other two stacks, one is for everyday use and one is for when you invite someone to have dry fish with you."* (CJ TR: 16)

In Klawock, Clara Peratrovitch noted:

> "*And that's why some of these people in town ... still gather as much as they can, if they don't[use it] they share it in the wintertime with the other family members that have not been able to ... go out or if they're living in another community, another town. Regardless of whether you need it, you can put it aside, fix it up, and in the winter somebody may need something, you can be generous and give them."* (CP TR: 18, 28)

Sharing or simple feasting was widely reported in a number of contexts during the season of salmon harvest and processing. When "stink heads" were consumed, people were invited to join; when "cheese" (cured salmon eggs) was ready people were invited to join;

and when salmon tails were being roasted over open fires, people were invited to join. This type of invited multi-household informal (i.e. not preceded in time by an explicit, delivered invitation) gathering for joint consumption was carried on by Klawock households on an ongoing basis during the summer fish processing season. It closely corresponds to behaviors Oberg (1973) observed in Klukwan during the 1930s.

RITUAL ACTION – FIRST SALMON CEREMONY

The mythic charter clearly calls for ritual action on the part of Tlingit in order for their relationship with salmon to be sustained. In order for salmon to be able to return, the charter calls on Tlingit to either return the bones of the salmon to the water from which they came or to burn the bones in the fire. It is not stated that this was to be done to or as a ceremonial event. Among other Northwest Coast peoples from the Columbia River northward, such a ceremonial event derived from a mythic charter is a common practice and continues in a revived form to be carried out by the Fraser River Salish annual. Tlingit scholar Frederica de Laguna (1972) and Northwest Coast scholar Gunther (1926, 1928) believed that the Tlingit did not practice a "true" first salmon ceremony despite the existence of the mythic charter. Evidence from interviewees indicates that there were various forms of ceremonious treatment practiced by Tlingit at the time of first salmon harvest that certainly look like a "first salmon ceremony".

Interviewees for this study reported a variety of different forms of action that were associated with "first" salmon but none articulated the necessity of some treatment of the bones in order for the salmon to be regenerated. Beliefs and practices associated with the "personness" of non-human beings no doubt came under strong negative pressure from missionaries and educators in the late 19th and early 20th century upon their arrival in Tlingit villages. In addition, the cavalier almost contemptuous treatment shown toward salmon, particularly violation of non-waste provisions and blockage of streams preventing salmon from reaching their homes, may have contributed to a lapse in these practices.

Hoonah interviewee Ken Grant remembered an event conducted by an elder that he observed on several occasions as a young boy. Mr. Grant observes:

"I know they did have a celebration and it was performed quite a few years ago.

> *After the ANB hall was built. That's probably the last time it was ever performed. It was a celebration of salmon coming in. I guess it's some kind of ritual that they had for it. It was done with Lonnie Houston and, all the old-timers. Geez, I wish I had a recording of it. It was a big celebration when they, when they saw it. He was dressed in his [regalia]. And he spotted the salmon and then there was a big celebration. He said,* "Yoot'u wé *basket* tayee." *("It is under the basket"). The basket on the other side of the court. He saw that's where the salmon was jumping."* (KGt: 13)

Among the intriguing elements in this tantalizingly incomplete account of a form of celebration associated with the appearance of salmon is Mr. Grant's specific recollection of the Tlingit phrase used by the elder. The humor comes from the juxtaposition of the basket in the Alaska Native Brotherhood hall for playing the game of basketball with the basket associated with harvesting salmon. It is both a spatial and metaphoric joke.

Klawock interviewee Clara Peratrovitch (PC) has provided a discussion of *Hinyaa* reception of returning salmon by her mother that gives strong evidence of a form of southern Tlingit first salmon ceremonious behavior. Mrs. Peratrovitch describes what happens as the time of salmon arrival approaches. When the first salmon (sockeye) arrived, all the clan or house members who owned the stream would be onsite wearing their regalia (woven blankets with totemic crests) to welcome back the salmon people, to sing and dance to demonstrate thanks and joy at their return. The children sang songs inviting the salmon to jump on the sharpened stacks that they had placed in the estuary. The clan or house leader would open a trap and ceremoniously extract the first salmon that would then be carefully cleaned and cooked with all present eating a portion of the fish. The act of communal consumption flows through other accounts as well.

Several forms of ritual consumption of salmon were reported by interviewees. As an example, Thomas Mills provides the following description of what happened at the Excursion Inlet village when salmon first arrived:

> *"At the arrival of the first fish every year we always bring it home, cook it and eat it. The first salmon is, we're talking about sockeye so boiled fish with sockeye was a real big treat amongst us. It just the way, the way it is with fish."* (TM TR: 8)

A more elaborated village wide communal feast took place at Klawock in the 1930s as reported by Theodore and Alicia Roberts:

> *"John Dick used to ... invite the whole town of Klawock ... when the first run of sockeye in the year ... then when the humpies get up the creek, he does it again. Twice in the summer time. He had a place all fixed up already [it was a pit dug out] ... it was all rock [at the bottom]. Then he built a big fire over that rock. When the rocks got red hot ... then he moved the fire back and he put that skunk cabbage on the whole bottom and he put all the fish on top of it. When he [was] going to feed for, this population is 700 at that time, when he [was] going to feed that many people, then you got to have quite a place where you put all that fish, sockeyes in there. Then he put some of that skunk cabbage over it. He'd seasoned it out with salt and pepper, garlic, whatever he had ... then, then he'd put that sand over the top of it ... just about this thick, to cover them anyway ... and then he'd build a big fire then over it . By that time ... people were coming up ... they used the whole thing, too. That's a lot of people, no room for nobody. There's enough there for everybody."* (TR TR: 70)

Note that Mr. Roberts' remarks include reference to a second feast of this kind that took place when the humpies arrived. Byron Skinna also reported a season ending feast/festival when the last dog salmon were taken:

> *"The only special thing was at the end of the season, when the dog salmon come up last ... that was the last salmon feast of the year. At the beginning of the season was sockeyes."* (BS TR: 4)

To an extent, these activities may be seen as forms of general thanksgiving for the return of the salmon and they may also be means of establishing social solidarity. However, the joint consumption of the fish, no matter the type of preparation, appears to indicate a continuing underlying tie to the mythic charter.

COMMUNICATION

Another example of "engagement" with salmon as people by Tlingit can be seen as a form of communication through interpretation. It will be recalled from the mythic charter, that when Salmon Boy was returning home with the salmon people he was told to stand up in the canoe to see where they were. In actuality, because he was a salmon, standing up was equivalent to jumping. By jumping, then, he was able to identify his parents and the stream where the family smokehouse was located which in turn made it possible to give himself to them.

Tlingit interviewees closely observe the manner in which salmon jump as they approach their home stream. Thomas Mills observed:

> *"Sockeye jump real quick. It's up and out. And cohos, they jump real high and land on their sides. And dog salmon when they jump, they just kind of lay on their side when they come out of their water and hitting the surface just jumping sideways… And king salmon they just jump straight up and right back down without hardly creating a splash. Humpies, they jump high…but you can distinguish that little, skinny little thing of ribbon flapping in the air as it flies out of the water."* (TM TR: 36-37)

In Klawock, interviewee Byron Skinna observed similarly:

> *"Sockeye jumps sideways real quick and the dog salmon jumps much the same way. I know the difference. But they jump much the same, on the side. The humpies ... they just jump up and wiggle around and flop . You can see them out here in the bay. Cohos, they just come up real high and flop back; king salmon. jump straight up"* (BS TR: 27)

These descriptions of the variations in salmon species jumping patterns are strikingly similar and reflect what the two men have observed through their lives.

A number of explanations were given by interviewees in response to the question why do salmon jump. Practical or pragmatic answers claimed that they did so to loosen up eggs for spawning, soften up milt for expulsion and eliminate sea lice from their bodies. The other form of answer given reflected, if not being explicitly grounded in, the mythic charter – namely that salmon were expressing their happiness at being home.

When intertidal wood weirs and traps were in use, Tlingit sought to communicate information to jumping salmon. Small wood stakes were carved that were attached to weirs so that they were visible above mean high water. The wood stake carvings were images of the stream owner or the totemic crest of the clan that exercised control over the stream (see Stewart 1977 and Newton and Moss 1993 for examples of these carvings.) These carvings were designed to help the salmon find its way back to its home.

While carved stakes attached to the intertidal weirs and traps might be one manner in which Tlingit sought to communicate with salmon, another might be through rock carvings. The petroglyph appearing on the next page is located near Dry Pass, at the north end of Prince of Wales Island in the middle of *L'eeneidei* territory. The dog salmon is the primary crest of the *L'eeneidei*. In the discussion of the social institutions and practices constructed by Tlingit to arrange their own internal relations concerning salmon, it was noted that Tlingit had claimed the petroglyphs were territorial markers. However, it might also be the case that the information they convey is equally available

to salmon who travel in the area. Given that wood carvings depict clan emblems, this petroglyph, with the classic undulating stripes on the side characteristic of the *L'eeneidei* clan crest, might be intended for either or both human people and salmon people to see.

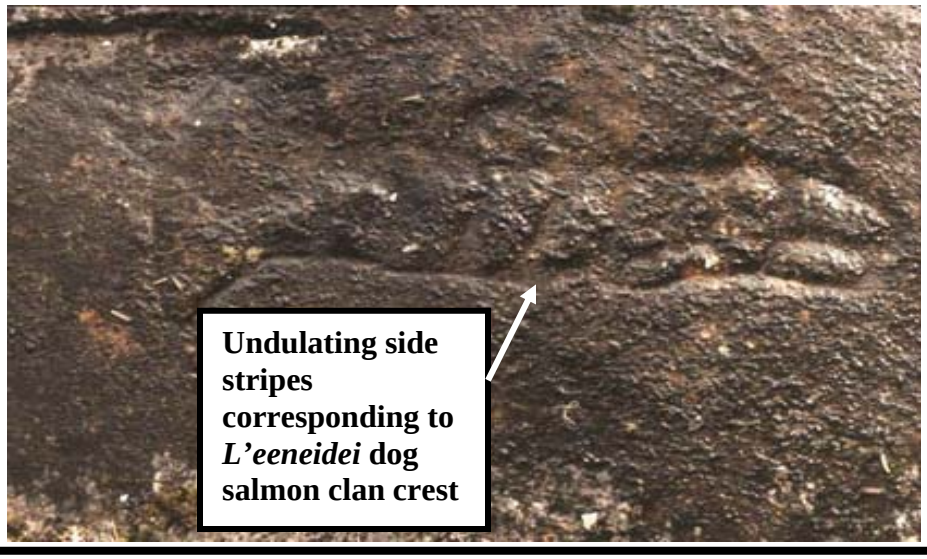


Figure 27 Petroglyph in the shape of the *L'eeneidei* clan crest located at Dry Pass on Prince of Wales Island. Photo by Terry Fifield

BEAUTY

Claude Levi-Strauss (1982) considered the northern Northwest Coast art tradition, in which Tlingit artists practiced, one of the greatest artistic styles ever developed. Aesthetic beauty – symmetry, balance, proportion, and creativity – is highly valued by Tlingit observers. Great effort, spiritual, emotional, physical, is required for Tlingit artists to produce objects with such exquisite qualities. It is a great honor to have objects of beauty presented to one. It is in this vein that Tlingit also communicated with salmon people – through the beauteous representation of salmon on public objects that at the same time represented themselves, i.e. Tlingit clansmen. One example of this can be seen in the design painted on the front of *T'il Hit,* a *L'eeneidei* house located in the former village of Tuxecan. Here again is the classic side striping depicting dog salmon as the clan's crest symbol (see Figure 28).

Figure 28 T'il *Hit*, a *L'eeneidei* house in Tuxecan, Alaska. Dog salmon crest is painted on the front of the house with characteristic colored stripes and teeth. Photo taken in the early part of the 20th century after people moved from Tuxecan to Klawock.

Another prominent way in which Tlingit publicly honored salmon was through their beauteous representation on the backs of blankets and in ceremonial hats. These forms of *at.oow* (clan property memorializing crests and events in clan life) were among the most valued and sacred items belonging to a clan. They were brought out for public display and performance only on enormously important cultural occasions such *koo'ex*, the memorial potlatch. Of the presentation of blankets with salmon crests appearing on their backs, Tlingit scholar Rosita Worl has written – "…a clan crest is not a symbol of an animal or story, but *is* that animal or story" (Fair and Worl 2000: 14). An example of a blanket depicting the *Kakoshittan* clan's sockeye salmon crest is presented below.

Figure 29 *Kakoshittan* clan blanket with sockeye salmon crest being held by two clan members in Klawock. The eagle in the center of the blanket represents the moiety division the clan is in. Courtesy of Jack Brown.

Commentary – Engagement as Relational Sustainability

The totality of Tlingit engagement with salmon must be comprehended through the cosmology, mythic charter, and practices that have been constructed on those fundamental understandings. It is a philosophy and a practice that can be defined as **relational sustainability** (Langdon 2003)**.** The fundamental premise about life in Tlingit cosmology is that it can return if humans act in appropriate ways. The mythic charter demonstrates the critical ritual action that must be taken to mechanically insure the reproduction of salmon. This likewise can be seen in the positioning of the harvested salmon with the head directed upstream. The structures of respect and the elaboration of the demonstration of respect through speech, art, dance and song exemplify the manner in which Tlingit wish to be treated. Through these signs, salmon people were shown that they were honored and that their return was a preeminent focus of Tlingit life. For only with respect and generosity will a relation with humans continue. Thus relational sustainability is the total philosophical and practical system that Tlingits constructed to maintain the existence of salmon and people.

The next two sections discuss additional aspects of the Tlingit practice of relational sustainability under the headings of protection and productivity.

B. Protection

Tlingit interviewees in Hoonah and Klawock reported a number of activities and elements designed to minimize predation on salmon, especially eggs and the female salmon that laid them and destruction of salmon habitat by other animals – namely beavers. These activities and technologies are here collectively termed protection.

Duck harvests and blinds

Tlingit interviewees commented on the spawning behavior of salmon often discussing the practice of the males using their tails to move the stream gravel to create homes for the eggs to be laid by the females. Another recurrent theme by interviewees was the battles between males that took place as they competed to deposit their milt on top of the eggs. Thomas Jack observed:

> *"They got those teeth, what they do is fight for the female…the winner, whoever wins, gets to put spawn on her eggs…knock her eggs out…that's just a matter of the toughest guy on the block. They fight, they do a lot of fighting…you see 'em, a lot times you see' em, tore up around the fins, fins will be tore up, that's when they're fighting."* (TJ TR: 46)

Tlingit interviewees observations on the location of salmon spawning relate sites selected for egg deposition to possible bird predation. James Osborne notes:

> *"You see when fish are spawning. They don't spawn in open areas. Right now the seagulls will do away with that. And they go underneath the branches or at the edge of the creek. Underneath, they work… the male fish makes a nest with their tail. And they lay the eggs in there."* (JO TR: 5)

In this comment by Sam Hanlon, a similar concern about the danger posed to salmon reproduction by seagulls is revealed:

> "*And in the river, there's always a big pocket of deep area. That's the deep part of the water. So when they look...down into that deep water, you could see them laying their eggs in the deep so seagulls don't feed on it. That's the spot they closely observe."* (SH TR: 14)

Despite the concerns about seagull predation on salmon eggs, they are not regarded as nearly the threat that certain kinds of ducks present. Thomas Jack makes the following observations on duck predation:

> *"They used to watch out for what they called* 'kaax' *...it's a fish duck … a gray color... a white man calls it 'canvas back' ... feathers that stand up and they only allow so many of them up the creek ... when we get too many of them we hunt them and get rid of them ... they eat it but they wouldn't throw it away, eat it but just allow so many in a stream].* (TJ TR:11)

Klawock interviewee Clara Peratrovitch noted that:

> *"... when the fry come out of the creek, the "sawbills" [mergansers] are out there. They just really kill the frying coming out of there."* (CP TR01:17)

The second comment points to the observation that ducks are also perceived to predate on fry on their outmigration. However, no explicit harvests of ducks at this time were described.

For the Klawock River, Clara Peratrovitch provided the following description of a structure made to capture birds predating on salmon eggs:

> *"That same well when it's not used ... in the fall, they somehow ... put* chaas hit *over it ... it means camouflaged house ... branches are put over it. They build on it and underneath and over here they'll pour a lot of little salmon eggs ...All the way in and right inside the opening they got a board [they sit on]; it's above the water that's flowing underneath them ... they're sitting up above inside that little hut ... and when the birds come in like ... sawbills, mallards, they grab it and just twist their neck. They're following the eggs in and that's how they got their fowl."* (CP TR:24-25)

The technique described above by Mrs. Peratrovitch was to use the rocks that anchored a circular basket trap in place for salmon harvest as a foundation for a platform positioned above the flowing stream. A small platform was constructed across the opening in the rocks with spruce or hemlock planks large enough to support a single man. Branches forming a small tipi-like structure were then placed on the platform. Sitting inside the camouflaged tipi, the man would release a few eggs to attract the ducks to approach the structure. When the ducks came within reach, they were captured by hand (see Figure 30).

On another occasion, Mrs. Peratrovitch indicated that the main concern about these ducks was not simply that they ate salmon eggs. It was recognized that during spawning some eggs would float freely to the surface. However, the danger these ducks posed was that they would dive into the holes where salmon had spawned and use their

River flow

Duck catching platform

The duck catching platforms were made in shallow water where ducks can swim. A platform was made of planks laid on top of rocks so it was slightly above water level.

Branches were used to make a tipi-like structure with a slight opening down stream. A man positioned himself in the tipi and dribbled salmon eggs into the river to attract the ducks.

When a duck came close enough to the opening, either at front or under platform, the man grabbed the duck by the neck.

This technique was used when the ducks on the Klawock River were abundant.

Figure 30 Klawock River Duck Catching Platforms. Sketch by Wanda Culp.

bills to dig up the gravel and cause the eggs to float to the surface. It was for this reason when there were too many ducks that they had to be controlled.

The duck species mentioned in Klawock and Hoonah were sawbills (mergansers), mallards, and canvas backs.

No mention was made, however, by any Tlingit interviewee of any harvesting of seagulls or other form of activity engaged in to protect salmon eggs from predation by seagulls. Since seagulls consume free floating eggs and do not disrupt the stream substrate, their consumption of salmon eggs was acceptable.

Dolly varden harvests and traps

Interviewees in both Hoonah and Klawock indicated that "dolly varden" were regarded as voracious consumers of salmon eggs whose abundance had to be controlled. The concern was that dolly varden might damage salmon return by the level of their consumption.

These concerns were voiced as follows by Thomas Mills for Excursion Inlet streams:

> "*Lots of times when we first came over here [Excursion Inlet] we used to build a fish trap up there at Neva Creek and we'd harvest all the Dolly Varden that were going back into the ocean. This was done in February, March, April whey they first started leaving the lake, heading back to the ocean. And I think this is why we used to have a lot of salmon cause we used to be taking hundred pound rice sacks, all of us in the village used to be taking hundred pound rice sacks of Dolly Varden home. The Dollys come out and the whole community [Excursion Inlet Tlingit] went up there."* (TM TR: 8)

This was accomplished in the spring time by building technologies designed to take dolly varden in large numbers. The Dolly Varden trap described by Mr. Mills involves the felling or use of a fallen log in the stream that extends across the total stream width. The tree is notched about 18 inches wide and half way through the tree. A flat lip about half way across the notch is carved on the downstream side. A screen-like device composed of small circular wooden pieces tied together at six inch intervals spaced approximately a pinky finger apart was constructed. It was wider and the intake, upstream, than at the outlet downstream. It is designed such that the upper, wider end of the screen lay on the lip so that there was a level transition from log to screen. The screen was laid at a

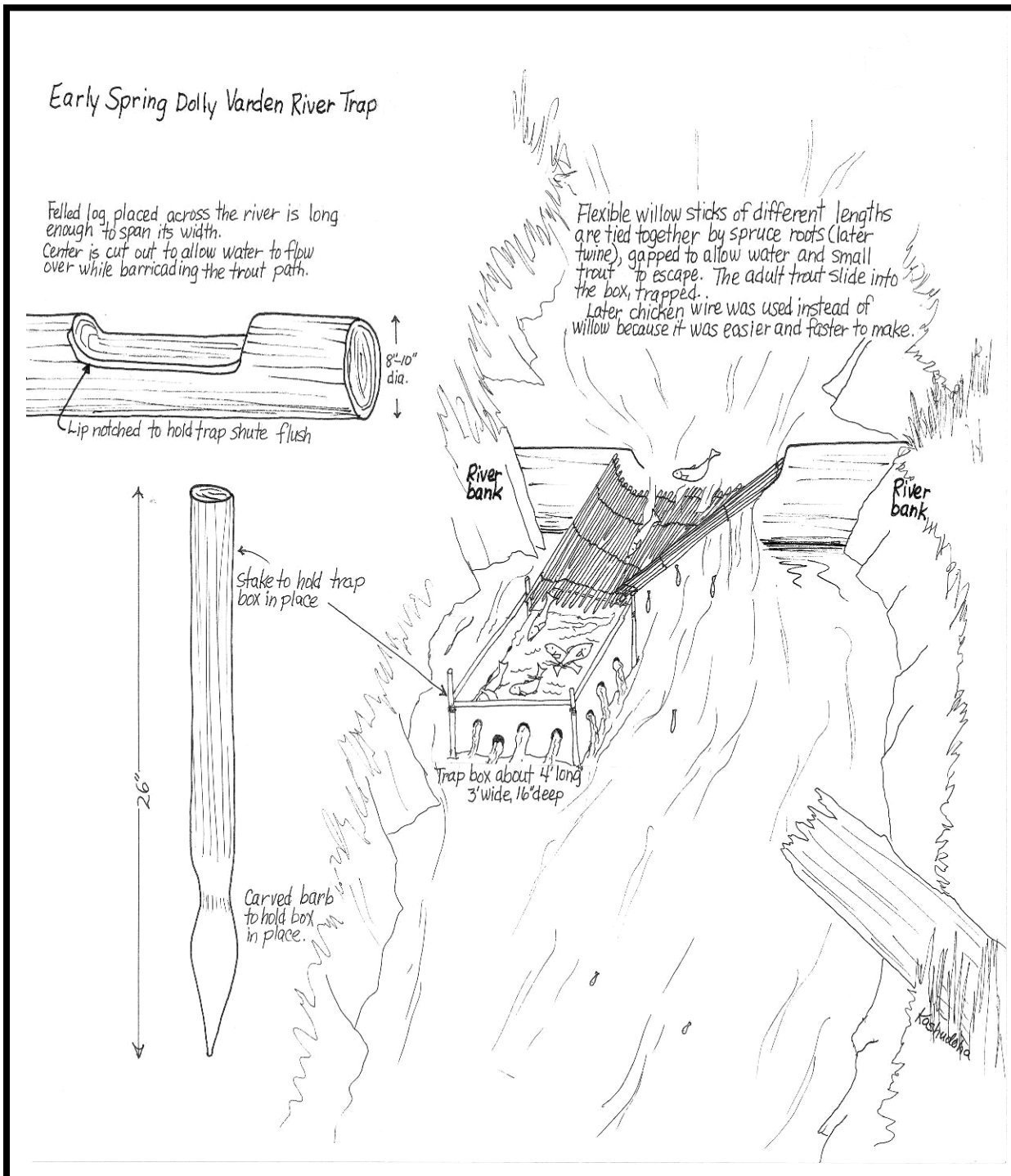


Figure 31 Huna Tlingit dolly varden log trap. Used on the upper Neva River to capture dolly varden while allowing salmon smolts and fingerlings to continue out migration. The trap was installed in the spring and taken out prior to the arrival of salmon. Copyright Thomas Mills 2004. Sketch by Wanda Culp

downward angle such that bottom emptied into a wooden box that was partially buried and pegged into the stream bed on the downstream side of the log. As the smolts and fingerlings left their lake and stream homes in the spring on their way downstream to the ocean, Tlingit interviewees perceived them to be exposed to massive predation by dolly varden. The dolly varden trap was designed so that the smolts and fingerlings would fall through the gaps in the screen safely to the stream below to continue on to the ocean.

Thomas Jack describes a similar structure that he had observed being used in Tenakee Inlet streams:

> *"In the spring time, you go across when the snow is melting. They put ... alder sticks in the creek, across the shallow part of the creek like so ... block it off ... put it across and the alder sticks were about that far apart… a thumb thickness from [each other]; I asked him, how come? He said, you have to let the smaller salmon and dollies come out ... and right where the 'V' comes, you have a trough ... you put a box, fill the box with holes in it, and the bigger trout will swim and fall into that ... and you take that and make a dry fish out of it."* (TJ TR:10)

A sketch of the trap described by Thomas Jack is presented in Figure 32.

<u>Beaver dams</u>

Tlingit concerns about in stream conditions that might threaten salmon reproduction extended to habitat issues. In terms of threats to salmon habitat, beavers were considered by some interviewees to be a danger due to their disruption of critical spawning grounds. In particular, the building of beaver dams on slow moving waters has the potential to block access to spawning grounds of sockeye and coho salmon that utilize the upper reaches of streams and lake tributaries.

Thomas Mills provided the following observations on the Neva River:

> *"We noticed that the sockeyes, we weren't getting as much sockeyes as we used to and pretty soon we just looked up, walked up the whole river to find out why. And when we got up by the lake over there, we saw that the beavers blocked out the whole lake where the sockeyes couldn't get into the lake and the bear and wolves and stuff were just having a field day. And some of the sockeyes that couldn't get up into the lake, some of them turned around and went back down the river. But there was a real poor showing…for those years. And pretty soon we started taking those beaver dams apart. And all that, my son is going to be 14 on the 10th of October so I think it was almost 10 years of his life that he helped take beaver dams apart. So now that we dismantled the whole thing there is a lot of fish going up the river again."* (TM TR: 40)

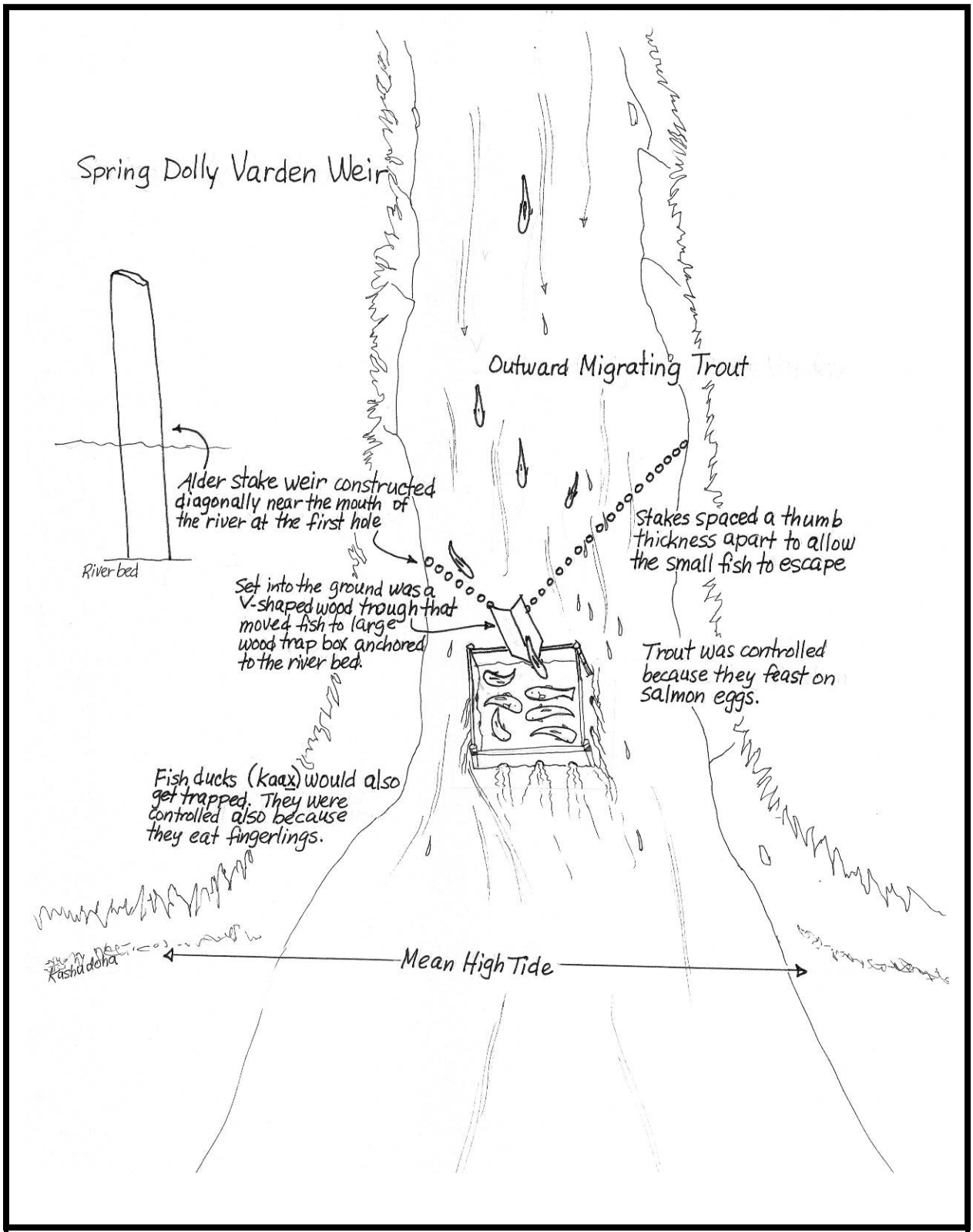


Figure 32 Huna Tlingit dolly varden stake trap. Used in Tenakee Inlet streams in the spring to capture out migrating trout predating on salmon fry. Copyright by Thomas Jack 2004. Sketch by Wanda Culp

Mr. Mills also noted that ADFG biologists had been informed about these circumstances and he believed that their job description now includes monitoring other systems for potential problems resulting from beaver dams that block salmon access to spawning grounds.

The issue of beaver dam impacts on salmon spawning streams is not seen uniformly by the Tlingit interviewees. Klawock interviewee Theodore Roberts does not believe that beavers can dam streams that salmon use for any length of time. In discussing the topic of trapping, however, other relevant information was obtained. As a young man in the 1940s, Mr. Roberts trapped mink and marten along the southeastern shores of Tuxecan Island to the north of Klawock. These lands were in the traditional territory of his clan, *Shunkweidei*. His grandfather, Mr. Roberts recalled, went up Staney Creek, opposite Tuxecan Island, where "he trapped only beaver." (TR PC) As the *Shunkweidei heen saati*, the grandfather likely was engaged in "taking care" of the stream by eliminating beaver dams in the headwaters and tributaries of Staney Creek where coho salmon spawn.

Mr. Robert Sanderson of Hydaburg has been actively engaged in recent research on the sockeye stocks of the west coast of southern Prince of Wales Island. He is of the opinion that beaver dams have the potential to significantly reduce sockeye salmon numbers by access to spawning grounds in the slow moving waters of lake tributaries.

Commentary on Protection

Additional information was collected on Tlingit relations with their in stream co-consumers of salmon, bears. Relations with bears fall more appropriately under the category of engagement in that while bears were certainly killed and eaten by Tlingit, these harvests were not directly related to issues concerning salmon. In general, Tlingit interviewees did not seek to protect adult and spawned out salmon from other users, namely seals, sea lions, killer whales, mink, eagles, and other co-consumers.

C. Productivity

In this section, Tlingit practices in regard to the maintenance and/or improvement of conditions supporting salmon productivity in streams will be discussed. These efforts differ from those discussed in the previous section as the goal of these actions is to

sustain or create conditions that provide opportunities for salmon to reproduce. They will be discussed under four topical headings: stream maintenance, "streamscaping", stocking and sexually selective harvesting.

Tlingit practice in regard to salmon streams was founded on ownership (controlling access), trusteeship (protecting the salmon run), and long-term engagement. ("taking care of") The principle of sustained relationship is put this way by James Osborne:

> *It's like a long range program what we do. Not for just now. When you do things from now, you're always wasting. That's when you think in long range…history.* (JO TR: 30)

Stream Maintenance. While salmon might be harvested in channels, straits, bays, and estuaries, Tlingit know that streams were the homes to which salmon return to lay their eggs. They were aware that salmon went to their "homes" in certain locations in the streams. In recognition of the "personness" of salmon, Tlingit referred to basket fish traps as either *nu* (fort, C. Peratrovitch) or *hit* (house, various sources), the same terms as used for places where human "persons" reside on land. They were aware of Tlingit species preferences for gravel, shade and slow moving waters. Tlingit were aware that in the spring, fry left the streams and began an out migration to their villages under the sea. Thus, the stream as "home", even if merely as womb prior to moving to the offshore home, loomed large in Tlingit consciousness concerning salmon.

The in stream phase of the Tlingit relationship with salmon included, as is discussed in greater detail below, behaviors that were designed to protect the areas where salmon laid their eggs, their gravel houses. Stream maintenance refers to Tlingit practices designed to continue positive in stream conditions for salmon behaviors. These were based on observations that produced understandings and a model of positive in stream conditions crystallized into a specific term, *ish* (discussed specifically in the next session).

Harvests of pink and dog salmon were conducted primarily in the estuary, at the stream mouth and in areas in the river immediately above high water. Harvests of sockeye salmon could occur at any of a number of locations from the estuary to the spawning streams that fed that freshwater lakes after the fish had spawned. Coho salmon,

due to the fact that they feed right up until they enter streams and continue to bite when in stream, were taken in the saltwater bays and straits as they searched for their natal streams as well as in the entire range of the stream from the estuary through the up slow moving reaches at the heads of streams where they prefer to spawn. Charles Jack provides the following characterization of how different species of salmon behave as they prepare to go into freshwater streams:

> *"Cohoes don't wait for nothing. They're up the stream. Dog salmon and humpies, they mill around the mouth for a long time. Sockeyes, too. You see a sockeye jump, it's almost too late to go get them because it's on its way up the river already. Sockeyes and cohos go up real fast. And cohos hide."* (CJ TR: 30)

In the case of sockeye and coho, Tlingit observed the in stream behavior of each species and the preferences exhibited for habitat as they moved to different locations to harvest them. They watched as salmon spawned in certain locations and observed the characteristics of those locations. Sockeye were observed to move in small schools quickly from the estuary into the river and then spend time in a lake before ascending to the lake tributaries where they would spawn. Cohos also moved rapidly from the bay into the river in somewhat smaller groups when conditions were right. They preferred habitats where branches and logs provided them locations to "hide" in, as Charles Jack notes above. Two interviewees, one in Klawock and one in Hoonah noted that on some occasions, groups of sockeye salmon that entered into a freshwater stream returned to the saltwater before once again entering the stream. Byron Skinna commented:

> "*The sockeyes especially kind of move around ... they'll go up and then come back out ... and then they'll go up and come back ...*" (BS TR: 17)

Thomas Mills stated:

> *"…most of the time you just notice 'em right away, they just head up river then they turn around and just speed right back out; not too sure if they're getting used to the fresh water or if they're just skittish."* (TM TR 10:)

Above all, Tlingits recognized that if at all possible, they had an obligation as trustees to provide access so that salmon could move into the stream from the estuary. The following account was provided by Mrs. Peratrovitch (CP TR:01) of the continuing concern among Tlingit to provide salmon opportunities to reach their homes:

> *"There's a coho creek up on that side, right across from Canoe Pass, where the*

> *road runs up. There's a culvert there. That's a coho creek. They logged up there. They threw all the tree limbs into it. My grandson always checks it out to see if there's coho there. He doesn't get it, he just likes to check it out. He went there and ooh …he was so mad. He saw the coho trying to get up. It was stuck in the salt water and they were ready to spawn. They couldn't get passed above the culvert. The tide comes up, it's still saltwater…He went home and took a hatchet and an old saw. He went back out there and he started pulling the branches out. And as he was pulling the branches out of the creek, the fish were right behind him. All the coho went up as soon as that place was cleared. So the fish I noticed is coming back. The fish that's going up that little stream, the fish is jumping right across from Canoe Pass. They'll jump there…they say they disappear going up that [creek]. My husband looked up there and they're going up as soon as it comes in, they're going right up. It's not blocked any more."* (CP TR01:17)

Along the Neva River, Thomas Mills commented that their activities would include clearing out logs and branches that created obstructions that prevented salmon from moving upstream. However, he also made a point to distinguish obstructions from trees, logs, and branches that were found in and next to the stream that did not impair salmon movement. These were, in fact, regarded as critical components of the natural habitat required and preferred by salmon.

James Osborne expressed a similar understanding about the nature of the habitat but appears to advance a more "hands off" view that Thomas Mills in the following:

> *"They hired a man as commissioner not very long ago from down south. I don't think that man has ever seen fish, but they called him the commissioner. 'The first thing we're gonna do is clean up the rivers'. … The Tlingit people were telling him, 'Don't touch nothing'. We saw the crew from Juneau come out to 'clean up'…made camps…pulling the branches from the river. That's what they did to a lot of these fish creeks. Next year, no fish. Very few. They cleaned the river. Even up to now there's hardly any. There's a lot of things that were taught to us, like don't bother the things in the river, like trying to clean it up. Never touch anything the way that's nature has something to do with it. We've done this for the salmon."* (JO TR:2,4)

The views of Thomas Mills and James Osborne are certainly reconcilable.

"Streamscaping"

Some Tlingit interviewees went further than merely maintaining access and protecting salmon habitat to actively "streamscaping" geomorphologic characteristics with the intent of creating more preferred areas for salmon. This apparently entailed the conscious reorganization of rocks in streams in an effort to optimize stream flow and to construct

habitats that met salmon and human needs. In this respect, the minimal interventions undertaken in the Neva River by generations of *Wooshkeetaan* and *T'akdeintaan* trustees may represent a different strategy from that espoused by *Chookaneidei* interviewee James Osborne.

On the Neva River, my guides Thomas and Patrick Mills showed me the general areas where they had undertaken "streamscaping". In fact, the destruction of beaver dams on the small streams that flow into Neva Lake is also an example of "streamscaping" in that those actions too represent conscious manipulation of the environment in order to accomplish positive benefits for sockeye salmon. What distinguishes the cases presented in this section is that the conscious intent in the rearrangement of these rocks and the construction of these features was to create a new locale for salmon that was based on the model developed through observation of salmon habitat preferences (see discussion below under Concepts for more on this construct).

The picture below was taken at a site on the portion of the Neva River that drains from Neva Lake and up which coho and sockeye salmon travel. While both species travel through this zone, only coho are said to spawn here. Sockeye salmon continue on up to Neva Lake and then to the streams above the lake. The river substrate in this area is composed of intermittent rocks, boulders and apparently rock. In between the rocks there are found gravels as well as muddy areas composed of lighter colored silts (see photo) and darker organics elsewhere. The stream travels steeply out of Neva Lake and then meanders through falls and rapids as well as relatively flat stretches. In the flatter sections, stream velocity drops and if depth is sufficient, then a pool forms. These pool areas and eddies along the faster stretches of stream are locations where Tlingits observe salmon "resting" – moving slowly and perhaps lingering for a period of time.

The pool areas without rocks are also the best locations for gaffing salmon as was demonstrated in the previous discussion of in stream harvests. Identifying specific fish

Figure 33 "Streamscaping" - semi-circular stone feature in the Neva River. Created by rearranging rocks in the stream bed to create a clear pool. The river flows from left to right thus the open area is upstream. The feature stretches approximately 40% across the stream from the north side to the middle. Patrick Mills gives scale to the feature his family monitors.

relaxed manner. Features such as they provide just such context.

In Figure 33 above, Tlingit trustees for the Neva River have created a stream environment that provides the following conditions:

- slower moving water than in the remainder of the stream channel;
- good visibility with a light substrate for gaffing;
- few rocks to maneuver the gaff round and through;
- gravel area for spawning.

The "streamscaped" pool provides increased spawning habitat, resting area for traveling salmon when humans are not present, and a gaffing site for Tlingit fishermen.

In certain cases, "streamscaping" may serve a solely functional purpose. Figure 34 shows a set of steps located in a harvesting area on the Neva River to assist gaffing.

Figure 34 "Streamscaped" steps for gaffing on the Neva River. Photo courtesy of Thomas Mills

At another location on the Neva River further downstream from the semi-circular pool and the gaffing steps, another feature was shown to me. In this case, as I looked carefully at what I took to be a "natural" feature, Patrick Mills said, "We are not the first ones on the river, you know." The feature consists of a straight alignment of stones across the entire stream channel which create a regular falls approximately one foot high uniformly across the stream. At the time of the guided visit to the Neva River on Labor Day weekend of 2003, rain was falling heavily and had been for a week. Behind the falls stretches a relatively flat zone approximately 60 feet long. The stream bed then becomes steeper in a zone of rocky rapids and tumbling water. As indicated in the photo below, the 60 foot zone above the falls creates a pool ranging in depth from about 12 to 24 inches at the time the picture was taken. While not completely emptied of rocks, the pool does provide both a resting area for salmon and a good gaffing area. It may also provide increased spawning habitat as well. The falls are easily traversed by salmon moving upstream with the water at this level.

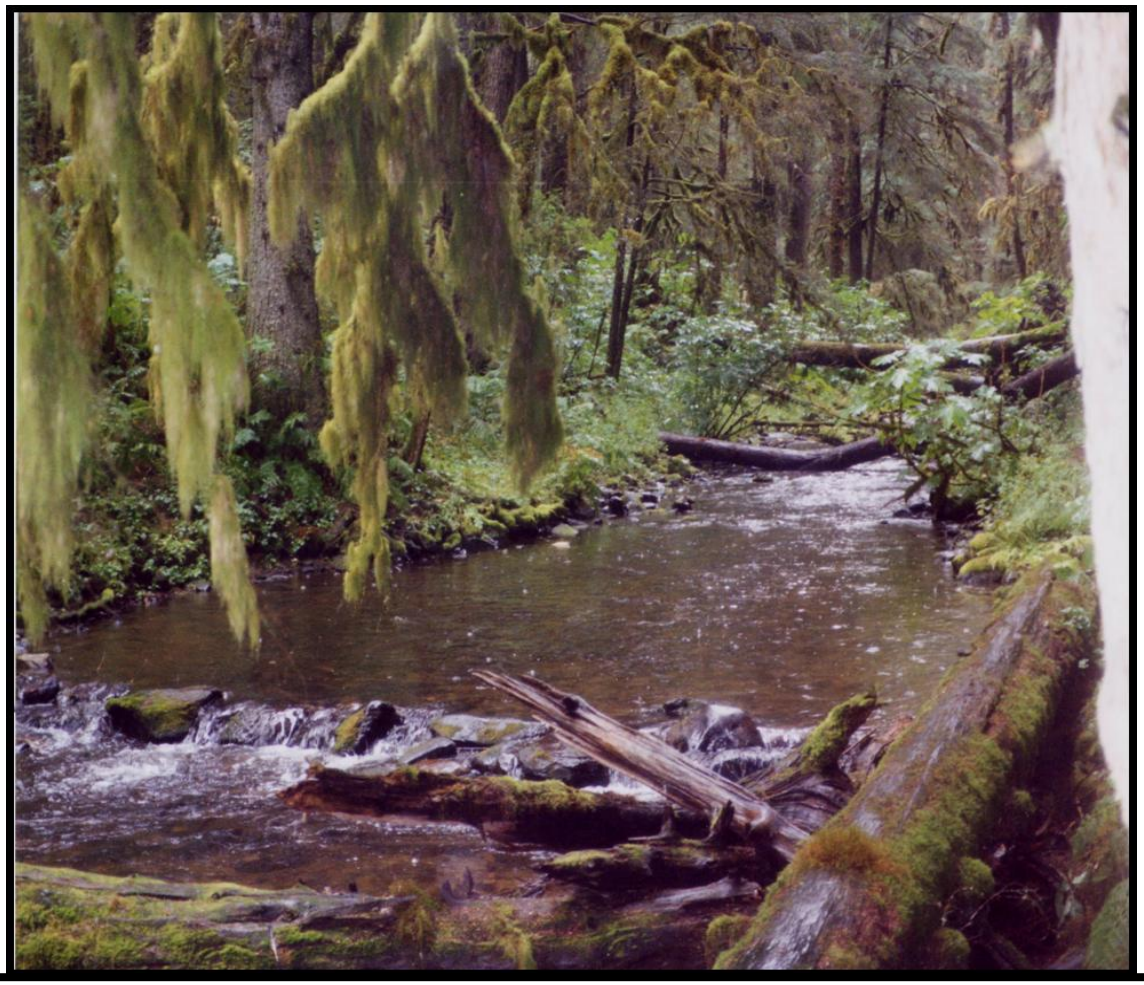


Figure 35 "Streamscaped" low rock falls on the Neva River. Behind this structure is created a combination slow moving resting pool (*ish*) for salmon and improved gaffing habitat as well as possibly improved spawning area.

In October, 2004, Thomas Mills reported that low water conditions had prevented salmon from being able to jump the small falls created at this spot. As an adjustment to these conditions, he had removed several rocks from the middle as a result of which the salmon were quickly able to ascend.

Commentary on "Streamscaping"

The features pictured and discussed exhibit a Tlingit desire to improve a number of features of salmon existence by active human intervention. Therefore, they represent a different approach to environmental conditions from James Osborne's view that natural conditions should not be modified. It is important to understand just what kinds of

modifications are undertaken here. They are modifications based on observations of salmon habitat preferences and habitat necessities. They endeavor to mimic conditions observed to be favorable to salmon elsewhere in the stream system and therefore increase opportunities for salmon reproduction. They do so as minimally as possible by using materials of the environment and rearranging them into hopefully more useful configuration. At the same time, these constructed features also serve certain human needs as well by creating additional and improved grounds for gaffing. Yet, even here the increased visibility of the created pools allow another productive strategy, to be discussed below, namely sexually selective harvests to be undertaken with greater precision and success.

Perhaps another example of Tlingit stream modification to enhance harvesting conditions are the rock channels constructed in association with wooden walkways and gaffing stations along the Chilkoot River. The apparent purpose of the construction consisting of parallel lines of rocks two to three feet apart was to provide a corridor less encumbered by rocks that salmon would choose to move upstream. The primary purpose was to make gaffing salmon easier.

There are also other examples of wood and stone structures that Tlingit built in streams discussed elsewhere in the report. For example, James Martinez described a circular rock structure located just below the tidal falls on the Klawock River, as a short term holding area where Tlingit fishermen placed speared fish until they were ready to take them back to the village for processing. While some of those structures, such as the Montana Creek weir and traps near Juneau and the Lost River fish trap near Yakutat, may have inadvertently had an affect on stream flow, they were neither designed nor implemented with a view toward modifying stream conditions.

Stock transfers

As has been established, Tlingit practice in regard to salmon is based on several premises. First, the foundational premise is to sustain a relationship through a logic of engagement based on the recognition of the shared qualities of "being/personness" between human persons and salmon persons that generates humans behaviors demonstrating respect and ethical actions called for by the mythic charter. Relational sustainability is the philosophical formula that follows from the ontological premise of sameness and the

desire for salmon people to return and give themselves to humans once again in the future. The second premise of Tlingit practice is to protect salmon reproduction by allowing them to reach their homes, insuring that access to spawning grounds is not blocked, protecting fertilized eggs in the spawning beds from depredations by ducks, and preventing excessive consumption of outmigrating fry by dolly varden in the spring. The third premise, as discussed in this section, is to improve opportunities for salmon reproduction through various methods of which stock transfer, the focus of this section, is one.

What if all of the techniques fail and somehow salmon returns fail? Failure to return may be due to a variety of factors. One cause may be stream blockage due to soil slides that bury streams. Another cause may be excessively warm temperatures combined with low rainfall and stream flow which prevent salmon from entering the stream or reaching their spawning grounds. Alternatively, low winter snow pack and high temperatures may reduce stream flow to such a level that salmon are unable to ascend their streams. At the other extreme, excessively high levels of rainfall in September and October may result in flooding and the scouring of spawning beds destroying recently deposited eggs. On other occasions, there maybe no observable reason why salmon fail to return. James Osborne observes:

> *"But we could take care so they can come back each year. I never did learn about this salmon return, but I've a… fundamental knowledge how the salmon reacts."* (JO TR: 2)

In circumstances of failed return, what do Tlingit do? The "leave nature alone" reflex leads inward to an examination of human behavior and a search for potential sources of failure to follow the mythic charter calling for respect. It might also lead to an investigation of those who have violated *ligaas* the Tlingit concept of tabooed behavior. Certainly the advance of glacial ice down *Seeti Geeyi* (Glacier Bay) forcing certain *Huna* Tlingit out of their homeland has been explained as an instance of *ligaas* violation. Indeed, the unpredictable nature of salmon return probably stimulated certain forms of ritual intensification among Tlingit in order to further extend their display of respect toward salmon.

However, even in the depths of Tlingit oral tradition, the great flood and its aftermath, a different strain of response – that of active human intervention can be found. There are several types of active response to salmon run failure that can be identified among Tlingit. One widespread Tlingit oral tradition concerns the great flood, its onset, human responses to survive, and subsequent activities in the aftermath of flood. According to an oral tradition of the *Kachadi* clan, whose ancestral stream *Kach* (meaning a red and green sockeye salmon [either immediately pre or post-spawning stage]) is found in *Kekc kwaan*, Tlingit observed in the aftermath of the flood that salmon were no longer found in many streams. Therefore a procedure was developed to create new salmon runs in empty streams. In order to do this, Tlingit ancestors acquired a number of male and female salmon from an already existing run. A water tight basket was obtained and the eggs and milt from females and males were placed into the basket. The eggs and milt were stirred and swirled together. The basket was then taken with great care from the first stream to the second. A location with good water flow and permeable gravel was selected and the basket was ceremoniously brought to the location. Accompanied by song and physical motion, several excavations were made in the gravel bed. At each one, a Tlingit woman stood crouch with feet placed on either side of the hole as a portion of the mixture was pored into the hole and then covered over with gravel. The oral tradition reports that through this procedure, salmon runs were re-established in a number of streams in the aftermath of the great flood. This oral tradition was provided by personal communication from Mike Jackson of Kake, September 2004.

The following account was provided by John Darrow of Klawock of another procedure used in attempt to get salmon to return to a stream following run failure.

> "In case the salmon in a stream fail, a man pays a brother-in-law who lives at a good stream to bring four pebbles from [the] good salmon stream. [T]wo [are to come from] the salt water at the mouth [and] two from up the creek. They are paid for ($5-10). These are placed…the two from the salt water at the mouth of the creek, the other [two] up the creek, e.g. at [the] mouth of lakes. This causes the salmon from stream to come to the poor one the following year." (Olson 1936)

Olson (1936) does not relate any further commentary from Darrow on the efficacy of this procedure.

In the early part of the 20th century, an earth slide covered a stream on the east side of Excursion Inlet near the stream mouth. It is the stream termed by Tlingit residents of Excursion Inlet and Hoonah as "Duncan's Camp" in reference to the ancestor who was the "trustee" for the stream. The slide was so massive that the stream was dammed and no longer exited into salt water. Subsequently, the salmon run to the stream was eliminated. The stream had supported a pink salmon run prior to the slide. Several years later, the stream had cut its way through the slide and once again flowed freely into Excursion Inlet. The Tlingit trustee of the stream, Mr. Duncan, decided to endeavor to assist in the re-establishment of a pink salmon run in the river. He took four pairs of male and female salmon from Homeshore Stream, several miles south of the blocked stream. This stream was selected because the pink salmon that returned to it were the largest in the Homeshore/Excursion Inlet area. The salmon were released into the stream at Duncan's Camp and subsequently a pink salmon run composed of large fish developed. The run persists to this day. This account was provided by Thomas Mills, September 2003.

Thornton (2000) reports that Herman Kitka of Sitka brought male and female dog salmon from the Excursion River to the stream on his family allotment and successfully established a new run with the transferred stock spawning in close proximity to Kitka's smokehouse. The purpose of this transfer was to create a late running dog salmon run that could be accessed at the conclusion of the commercial salmon season.

More recently, *Huna* Tlingit have attempted to establish sockeye salmon runs in streams with small lakes in the Excursion Inlet area. In the recent efforts, the methodology of transporting male and female salmon from the Neva River to the freshwater lake has been utilized. To date there is no evidence that this transplantation has been successful.

Sexually selective harvesting – "We Took Mostly Males"

This section discusses findings concerning sexually selective harvesting practices for salmon reported by the interviewees. Topics covered include whether there was sexual selectivity, how it was accomplished (if there was) and what reasons were given to account for sexual selectivity.

Most Tlingit interviewees made it clear that sexual selection was fundamental to their salmon harvest practice. The majority of interviewees in both Hoonah and Klawock mentioned that males were primarily targeted. In Hoonah, James Osborne observed:

> **"***At first they told us what kind of salmon to take. We took only the male salmon and very few female, for the eggs. Not much of the female, because the female had the eggs. We could tell the salmon apart. We know the salmon is going up the river to spawn. "* (JO TR: 2)

Karl Greenwald observed:

> *"We'd try to get the males. Especially the humpies."* (KGd TR: 18)

Charles Jack observed:

> *"My grandfather tried to get mostly males. Get enough, but mostly males."* (CJ TR: 36)

Thomas Jack observed:

> *"He'd tell us, my grandfather told us which ones to get. He'd allow us to get a few females not too many; we'd get mostly the males."* (CJ TR: 32)

In Klawock, interviewees also generally took the position that males were the overwhelming target when taking salmon. James Martinez observed:

> *"Mom used to tell me, go up the creek and catch the wide humpy ... wide humpy ... we get it home for boiled fish ... Yeah, the wide humpy ... So, that's what I used to do ... I used to catch the wide ones, clean it and bring it home. She said leave the small ones alone because they're the ones that will lay the eggs but the wide ones you bring home."* (JM TR: 42)

Theodore Roberts observed:

> *"Males, just males ... mostly males ... no females ... They don't touch the females cause the eggs are still in there."* (TR TR: 19)

Ron Williams observed:

> "*We were told to get the wide humpies…males with big humps."* (RW TR: 7)

Clara Peratrovitch comments at length:

> *"Q: When they speared sockeye in the river, did they target certain ones?*
> *CP: Just the males, because the male has more fish on it than the female. The female has the eggs and they protect that. They don't try and do away with the female. It's just the male; …the back rises high and so its easy for the Native people to spot. They have a slight hump and they're bigger. The males are flat and big. You can always tell the round belly of the female. In fact, that's the only type that the Native people target for*

> *is the male. They don't bother with the female. …that's the reason why the fish was so plentiful. Nobody bothered with the female."* (CP TR01: 16)

Mrs. Peratrovitch was asked about selectivity when traditional basket traps were used to which she replied that they only took the males from the baskets and let the females go.

While most interviewees mentioned that males were the primary targets, others claimed that there was no particular sexual preference. This was the case among Hoonah and Klawock interviewees. In Hoonah, Ken Grant observed about whether there was a preference for males or females:

> "*No. No. You just gaffed…you just gaffed the fish."* (KGt TR: 10)

Thomas Mills observed:

> *"When we go up and get a batch of fish, sometimes it is all male, then the next time we go up, sometimes its all female. Because sometimes where we are up there in that little pool, it is all filled up with females. And the next time we come up there, it's all males."* (TM TR: 29)

During my guided visit on the Neva River, Thomas Mills harvested 12 salmon, nine of which were male and three female. This may have been due to the relative presence of the fish or to an unconscious pattern of selection. Patrick Mills stated that he preferred males due to their larger size. This comment reflects a productivity/efficiency logic in that more food can be obtained for less effort by taking males since it takes the same amount of time and energy to clean and process each type.

In Klawock, several interviewees were also of the opinion that there was no sexual preference. James Martinez observed:

> "*It didn't make any difference. You went up there ... to spear fish ... and bring some home and ... you speared the fish and brought them home."* (JM TR: 40)

Byron Skinna observed:

> *"No, it didn't make any difference, it was pretty hard to tell when the creek's higher --it's hard to tell one from the other ... Once you speared them, you brought them home."* (BS TR: 9)

Despite the emphasis on males, some females were harvested as well. Generally this was done in order to obtain eggs for certain foods. The primary species from which eggs were sought were dogs, cohos and to a lesser extent pinks.

Charles Jack observes:

> *The only time he'd get the females is so he can get some eggs to make* kahaakw k'a s'eex *(cured eggs).* (CJ TR: 36)

In Klawock, another form of selective harvesting of female pinks was mentioned. One interviewee mentioned the salting of pink female bellies as a special product that required sexual selective harvesting. This may have been a post-contact development following the introduction and widespread use of the beach seine which does not allow for sexually selective harvesting.

Given sexual selection of one form or another, how was this accomplished? For interviewees who indicated male preference, the answer was simple. They knew the differences and could see them – males are larger, are "flat", have more hooked noses, and are prone to fight, at least in certain species. The interviewees stated that the males could be selected with the gaff or spear. Likewise, when after females, those too could be identified and targeted. Nevertheless sometimes errors did occur. James Martinez commented that when he was a boy of 8 or 9:

> *"So, I used to go up there and try for wide ones ... I unfortunately I would catch one of them small ones ... and let it go ... hoping they wouldn't see me, or anybody tell her."* (JM TR: 42)

Figure 36 Male and female pink and dog salmon

Pink salmon – male on top and female on bottom. Note "wide" hump on the back of the male.

Dog/chum salmon – male on top and female on bottom. Note distinctive colored stripes on sides.

Mr. Martinez' comments illuminate several considerations that impinged on him as he endeavored to gaff "wide humpies." He released female humpies taken by mistake. He was cognizant that the prohibition on taking female humpies was widely shared among Klawock Tlingit and that if someone saw him, he might be reprimanded. Finally, there was a possibility that someone who observed his error might tell his mother which might also result in him getting in some kind of trouble. This small statement is quite revealing concerning the social relations and internalized attitudes that were a part of the spearing of salmon in the Klawock River for this young man.

One final remark about sexual selectivity is in order that pertains to spawning and transition to post-spawning phase of salmon existence. Tlingit recognized that coho and sockeye continue to live for a considerable period of time prior to and after their spawning. Indeed, as presented earlier, Tlingit sometimes desired and preferred spawned out fish. With sockeye, and especially coho, however, it is sometimes difficult to determine if they have completed spawning when in the stream. Tlingit did not want to harvest fish in the upper reaches of streams above the first hole that had not had the opportunity to spawn. They therefore wanted to make sure that coho had indeed spawned before taking them. Thomas Jack comments on his grandfather's practice as follows:

> *"Just after they spawn, you get 'em for boil fish ... cause he usually wouldn't let us touch the ones with the eggs, them or milt, he said, you got to let them spawn, just let them come up the creek, they have a long, long ways to go before they got here, and a lot of people try to catch them, and sharks and everything else chased them around all their life. At least let them spawn, before you catch them."* (TJ TR: 41)

Commentary on sexual selectivity for males

The finding of widespread sexually selective preference and practice for taking males over females, especially of pink salmon, is of substantial interest. There appear to be two fundamental reasons in Tlingit thought for harvesting primarily males. The first of these is to maximize the number of females so that they could lay their eggs in order to insure reproduction. The implications of this proposition, although not completely fleshed out in interviewees' commentary, are several.

The first implication is that interviewees model of salmon reproduction includes the observation that a male salmon is capable of fertilizing more than one female.

Following from this premise is that there are surplus males that can be taken prior to spawning that will not reduce the number of fertilized salmon eggs. How this finding came to be understood was not fully explored with the interviewees. One possibility is that interviewees or their ancestors may have observed males fertilizing the nests of several females or they may have observed that milt released by males drifted downstream into other nests over which it was not deposited. Biological studies indicate that salmon milt remains motile after drifting up to 15 or 20 feet downstream (Groot and Margolis 1991: 148).

A second implication from the primarily male model of harvest follows from the observation by Tlingit interviewees that male salmon fight for the opportunity to mate with females. They also perceived that male fighting could disturb and damage other nests where spawning has been finished. Such disturbance could well have been viewed as leading to reduced number of salmon fry able to reach the ocean and therefore be of concern to stream trustees. By reducing the number of males, fighting and disrupted nests could be reduced and increase the likelihood of a higher rate of egg survival.

The combination of these two observations could give rise to a reasoned practice for primarily taking males. The efficiency/productivity factor would in turn buttress this practice.

The second reason for taking primarily males is that they are larger and therefore a greater amount of product could be derived from them. This has both a quantitative dimension and an efficiency dimension to it. More food was acquired by focusing on males and it was done so at lesser cost in that virtually the same amount of processing effort went into males as into females. A similar efficiency factor is also apparent in comments about size preferences as they pertain to harvesting fish of characteristically different sizes from different streams. For example, in comparing Deweyville sockeyes with Klawock sockeyes, Joanna Woods expresses her dislike of having to process the smaller Deweyville fish thusly:

> *"Yeah, didn't like working on them [Deweyville sockeye] though. They were too small. You were lucky if you got two cans out of one Deweyville fish."*
> (JW TR: 8)

The two reasons for preferring to obtain male salmon evidently produced a pattern of Tlingit harvest that did allow a much higher rate of female spawning in the past than is presently the case. Further implications of this aspect of traditional Tlingit practice is discussed later in the report.

D. *Ish*

The Tlingit Council of Traditional Scholars established by the Sealaska Heritage Institute was asked by Dr. Rosita Worl to discuss the concept of "ish" during one of their meetings in 2005. Presented below are some of the remarks of various elders defining and characterizing the ish, identifying various locations where ish are found, discussing other dimensions of the ish and situating the concept in the larger Tlingit cosmological realm. Their remarks are followed by a short summary commentary on the concept that concludes this section.

One of the topics the elders explored was a basic definition or characterization of the term. George Ramos, Tlingit scholar from Yakutat, provided the following definition of "ish" (SHI 2006):

> "Ya ish, ku aa yaat, heen yix´ kei yana éinee, xáat áyá gaaglaanee yé ax´ áyá hás alséix. A dax a ya tsu gunéi hás ya éix. Ish a yaa yéi duwasaakw. Ish ka glaani yé áwé. Xáat aa ilséixee ye.
>
> *This place called an ish on a river tributary is where the salmon rest; it is a deep pool of clear water and from here they continue their journey. This is called an ish. It is a deep water place. The place where salmon rest."*

Clarence Jackson, Tlingit scholar from Kake, provided the following definition and discussion about the ish:

> "Aakw yax a x´aax´ yéi nduteech ax´ kei yas éich, aa áyá ish yoo duwasakw. Gaaglanee heen áwé tlel tlax oonadaa áwé xat a kaa oolsaaych.
>
> *It is like a little lake and this is where the salmon gather and surface; this is what is called an ish. It is deep water that does not flow too fast where salmon rest."*

Joe Hotch, from Klukwan, provided the following information:

> "Ch´a ya kooxdé nu yax yateeyi aa heen áwé a yax x´adutaan ... ish. Ya xáat has du jeet xaduhaayin.
>
> *This can also be a back eddy and it can be called an....ish. This is where the salmon would be taken from."*

A number of elders commented on specific locations of *ish* with which they were familiar. George Ramos (SHI 2006) described specific *ish* with which he was familiar:

> "Áwé Yaakwdat k̲eeyateení wé car yanashixee aandé wé brdige aa áwé K̲óoxjéinik. Aa eexi yaax´ kawahaa wé ish. Yaa haa aani déinax aa Gwaats´ílaa yoo áwé duwasakw wé ish. Ldakaat a saayi k̲utseeti wé Dry Bay aayi tsu ya K̲óox̲jéinik wé heench duwasá wé heen.
>
> *When you come to Yakutat and you are crossing over the bridge going to town you will see the ish called K̲óoxjéinik. It is on the south side, the ish. The ish behind our village is known as Gwaats´í laa. There are names of these waters even the one at Dry Bay, the waters are named K̲ooxj̲éinik, also."*

Clarence Jackson noted:

> "Oo han haa aayee wé ha aan déit kat xat séiwaxaakw.
>
> *The one behind our village [Kake], I forgot about it.*

Herman Kitka (SHI 2006) of Sitka provided the following remarks about a famous *ish* from which a *G̲aanaxtéidi* (Raven clan) house group from Angoon took their name:

> "K̲akw Bayx´ hit has a woolyéixi, áwé yoo hás awasaa. Yoo xáat aa kéi hingee yé aa x´eeyax ish al déin.
>
> *Basket Bay people when they built a house there they named it Ish Kahít. Close to the mouth of the lake there is an ish where the salmon swim up to."*

David Katzeek, a scholar who traces his origins to Klukwan, located an important *ish* on the Chilkat River that he was told about:

> *"I know what an* ish *is because my grandfather James Klanott, Raven and Daniel Katzeek Eagle/Killer Whale told me what it was when I was a boy and so did my father. There is one of these hydrological pools around 19 mile in Klukwan/Haines area."*
>
> David Katzeek offered the following observation on the Chilkat River *ish*:
>
> *"The reason salmon gather there may be to rest, however, the primary reason is because the upwelling of the ground water is pure and is well oxygenated which is what the salmon like. If you look at the river it is normally milky with sand and silt. Clear cool ground water is pleasing and helps the salmon."*
>
> In situating the concept of *ish* in Tlingit philosophy and metaphysics, noted Tlingit scholar Walter Soboleff of Angoon, provided the following discussion of *ish* (SHI 2006):

“Ldakat yéidé at áyá a dat atwooskoowux hás sateeyin. Tsu ya ish yoo duwasaku at tle tlel oonatle ch´a tle Lingít yax̲ ax̲ x´adutaanin ya ish. A déi hás x´aalatséen yéi yeeyí. Ya hás du kusteeyí oowayaa a kax´ yéi nateech. Hás du át x̲aayee ach´ áyá tle yéi ax̲ xadutaan. Ka yax a yoo lak̲éiyin, ka yaa lik´éiyin ach a yoo tlel at kawashook̲ yax̲ ax x´éi du taanin. Yéi oosh k̲uyaawakaa ch´a kunax du shoogu yéi k̲u aa, haa i tlé ligaas tlel yéi ax x´adutaan wé át. Áyá dléit kaach yéi a yasakw taboo. Yéi yeeshgeetí áwé ch´u k̲udzitee k̲uwoojee i kaa yéikgwanee áwé wa yéi yateeyi át x̲a. Ldakat yéi haa daax´ duwateeni át kutzíteeyi át yéi duwasakw. Áyá ch´aagoo dax áwé Lingít yéi at g̲aseek̲u.

There were those who were knowledgeable about all kinds of subjects. This thing named ish - *it was almost as if it were human and it was spoken to in that way, this* ish*. This is how they valued this resource. It was as if their life depended on it so they treated it with respect. Because they got their food from this place is why they would speak to it. There was pride, there was honor (given to the ish) so no one was to say anything foolish about it or to it. If it was said that we could laugh at it, it was not so. We were told not to talk to it in a foolish way but to respect it. This is what the white man calls taboo. When you do this there is a discipline, a law that will correct you. It will be like it falls on you; this is the way this is. All that is seen around us is said to be alive around us is what it is called. The Lingít people have known this to be true from time immemorial.”*

Figure 37 *Nakw Ishk'* – Jim Martinez at the Klawock River *ish*

V. CONCLUSION: Concepts, Comparisons, Questions and Implications

The information presented in the previous sections provides insights into many aspects of Tlingit traditional salmon knowledge, harvesting and relationships with salmon. This concluding section presents a discussion of "traditional ecological knowledge", a summary of Tlingit concepts, comparative perspectives concerning Hoonah and Klawock Tlingit perspectives on and practices with salmon, a comparison of Tlingit and Western systems of relationship with salmon, questions for future research arising from the information presented and implications of the findings for the Fisheries Information Service and the Office of Subsistence Management.

Traditional Ecological Knowledge – Concepts of Various Kinds

The topics and information sought through this research fall under the broad rubric of "traditional ecological knowledge" (TEK) also termed traditional knowledge and indigenous knowledge in the anthropological literature. These different labels or terms can indicate important differences in the epistemological approach of the researcher and the procedures used in the research. In part the differences can be understood by the anthropological distinction between "etic" and "emic" perspective. "Etic" refers to a research strategy that privileges concepts and procedures from Western science and discourse as the basis for observation, data collection and interpretation of behaviors of people with entirely different linguistic and cultural characteristics from those of the Western researchers (Barnard 2000). "Emic" refers to a research strategy that seeks to comprehend the categories, concepts and processes by which populations from different linguistic and cultural heritages construct understandings of their existence, including the environment in which they live. "Emic" researchers do not deny the existence of out there phenomena but view the manner in which understandings of those phenomena are constructed within a cultural context as the central focus of inquiry. Classically in cultural anthropology the first approach ("etic" materialism) has been referred to as cultural ecology while the second has been referred to as ethnoscience ("emic" constructionism) (Barnard 2000).

Researchers who seek more or less direct "empirical" analogues to concepts and processes used in Western scientific discourse in the observations and information provided by "folk" or indigenous populations, generally see "ecological" as pertaining to

material relationships between organisms and environments associated with the biological subdiscipline of "ecology". For example, Inglis (1993: vi) asserts that

> "TEK refers to the knowledge base acquired by indigenous and local peoples over many hundreds of years through direct contact with the environment…which parallels the scientific discipline of ecology."

Research questions framed from this perspective tend to be structured by Western scientific understandings and interests in translating indigenous perspectives into knowledge bits as comparable as possible to the concepts, structures and processes used in Western science. Such a research perspective may or may not utilize the indigenous language but if it is used, a basic assumption of the "etic" research perspective is that translation will be relatively straightforward as the observable phenomena that are the basis for indigenous observation and conceptual development are given and do not vary based on conceptual construction.

Researchers who seek an understanding from the indigenous viewpoint, by contrast, begin from an entirely different epistemological vantage point by ignoring, at the outset, Western concepts. Miraglia (1998: 5) indicates that TEK "is a knowledge system in its own right" and "it is important to understand the social and cultural embeddedness of TEK." Research procedures are designed to elicit the concepts by which the indigenous population comprehends and explains the world around them and their position in that world. Rather than beginning from an extreme empiricist position of the existence of a given world in which humans perceive similar entities, events and processes, researchers pursuing "emic" questions operate from a constructionist perspective which holds that humans live and act in accordance with linguistic and cultural concepts through which perceptions and existence are filtered and organized (Barnard 2000). A crucial understanding of this approach is that language is central to constructing meaning and therefore it is important to comprehend, to the extent possible given the different linguistic and cultural backgrounds of Western researchers and indigenous consultants, how the indigenous (or any) language operate in regard to transforming perceptions into concepts and processes. A recent discussion of the centrality of language structure and concepts to knowledge construction related to life forms and natural processes can be found in Maffi (2001).

An excellent example of understanding likely patterns of historical movement through comparative linguistic analysis can be found in James Kari's examination of Athabascan terms for different kinds of salmon. In his analysis using an "emic" proposition concerning the manner in which terminology follows knowledge construction, Kari demonstrates how Athabascan terms for sockeye salmon are derived from other salmon terminologies. Through this analysis, Kari suggests a directional movement of Athabascan people from interior Alaska where there are no sockeye salmon stocks to the areas south of the Alaska range where there are sockeye salmon (Kari 2002). In a similar vein, the close correspondence of the Tlingit term for salmon or fish (*x*aat) to the Tlingit term for sockeye salmon (*gaat*) could well be an indicator of the centrality of this species in early Tlingit adaptations to the coastal environment of southeast Alaska.

Another example of the complexities revealed in language can be seen in the Tlingit name for Salmon Boy discussed later in the report. His name is *Aakwatatseen* that translates as "Alive in the Eddy" a name which demonstrates how description and instruction are embedded in Tlingit personal naming practices (AKNRS 2004).

With an understanding of the manner in which a language provides concepts and processual understandings, researchers can then proceed to an understanding of the cultural organization of knowledge. The cultural meaning assigned to the concepts and processes can then be approached and examined as they are linked to external phenomena cited by indigenous observes. In addition, the "emic" perspective must also investigate and encounter the larger cosmological ideas, themes and processes at work in the indigenous culture that is ultimate source of comprehension for indigenous actors. Various forms of mythic and legendary traditions provide core elements of the overall beliefs, and cultural practices are typically grounded in them to a greater or lesser extent.

The "emic" perspective also recognizes that the manner in which knowledge is organized and presented is likely to differ from one culture to another. It is therefore important to determine what are the standard and most comfortable forms through which knowledge is transmitted. For example, indigenous Alaskans generally strongly distinguish between knowledge provided them by their elders and stipulate that this is the source of their understanding. Knowledge from elders differs from that resulting from

personal experiences and observations. Most Alaska Natives are unwilling to transmit second-hand observations from other observers as authoritative knowledge.

The importance of "traditional" knowledge transmitted by elders is often demonstrated in Alaska Native discourse by direct citation of the elders as the source of information provided. Stories of past personal experiences encompassing a wide range of experiences are also a primary means through which information is transmitted. Stories are extremely important means for demonstrating not merely specific observations but also to reveal associated concepts and observations that are networked.

A key observation that follows from this distinction is that "ecological" is a problematic term to use to characterize how indigenous knowledge is conceived and organized. It is grounded in the materialist notions of Western science which do not operate on the same cosmological (being) and processual (relations and transformations) foundations that characterize the "traditional" understandings of Alaska Native groups. In order to adequately convey those understandings, a broader conceptual framework, here termed traditional knowledge is employed in order to bring in these additional critical aspects of Tlingit thought.

The distinctions among local knowledge, indigenous knowledge, traditional knowledge and traditional ecological knowledge are important to recognize in order that the assumptions, limitations and possibilities of such investigations are adequately understood. With appropriate contextualization, it is possible that comprehension across cultural and epistemological difference can be bridged. It requires commitment and diligence to accomplish.

Tlingit Concepts Concerning Salmon Characteristics and Behavior

Tlingit conceptualization of salmon behavior can be identified in a number of specific constructs that appear in the interviews. Several Tlingit terms or phrases clearly encode broad understandings and are utilized in various ways to channel Tlingit behavior toward salmon. Some of the concepts rest on direct observations while others pertain to processes and phenomenon unseen that relate to salmon. Still others are premised on the "personness" of salmon and the necessity of behaving in appropriate ways toward salmon. The most prominent and recurrent of these concepts is that of "respect".

Yaa.awune – "Respect"

Identified by virtually all of the interviewees in both Hoonah and Klawock, the first and most overarching of these concepts is generally translated as "respect." Tlingit youth were taught to "respect" all living things and non-living things as well. Ken Grant observes:

> *"…everything was treated with respect, you know. Not just salmon. Bear, deer, everything. Everything was handled with a lot of respect. The salmon was no different. We treated salmon with respect…talked to salmon."* (KGt TR:17)

This is evident in the salmon mythic charter – Salmon Boy - and is also present in the Fog Woman myth. Lack of respect demonstrated by the boy *Aakwatatseen* in the mythic charter and Raven's disrespect in the Fog Woman myth are the primary causal events in the stories. Spoken acts of disdain and disrespect in the first case lead the salmon people to take *Aakwatatseen* to their home where he can learn respect while in the second case, Raven loses all the salmon provided by his wife, Fog Woman, and she leaves him due to his disrespect. After telling a version of the Salmon Boy story, Thomas Jack stated that what the story was about was "respect – respect to the fish." (TJ TR: 26) These are powerful lessons.

What does it mean to show respect? There are a number of ways in which this is demonstrated. Voicing disdain (as in Salmon Boy's negative comment about the mold on the dry fish), laughing at, making fun or in any other manner speaking negatively about salmon was *ligaas* (taboo).

By contrast, welcoming returning salmon through speech, song, dance and the display of regalia (dance blankets) were all positive signs of respect that salmon would recognize and be pleased with. Thanking salmon for returning and providing the people's winter food was another important element in demonstrating respect.

The capture and handling of salmon is another behavior where respect must be shown. Salmon were to be handled gently and not tossed around carelessly or thrown onto stones on the beach. Thomas Jack notes:

> *"You know when you get the fish after taking it in, you got to take care of it. You can't just pick it up and throw it. You never throw a fish or never drop it. You got to take good care of it."* (TJ TR: 19)

This same point was underscored by Deborah Dalton who commented as follows:

> *"We just don't throw our fish, we are careful not to crush the salmon. There are certain reasons why you don't throw your fish around. When you hit it, you hit on the head, you don't hit it on the body. You gaff the salmon's head, not on its body. That's how it was done."* (DD TR: 5)

Ligaas – "Taboo"

This term was recognized nearly universally in both Hoonah and Klawock as relating to traditional Tlingit "taboos" or proscriptions on certain behavior as well as not carrying out the prescriptions for appropriate behavior. It was also *ligaas* not to engage in the correct behaviors. As Charles Jack observes:

> "*Taboo applies to everything* (Ldakat at awe ligaas)" (CJ TR: 6)

In his discussion of *ish* presented earlier, Walter Soboleff also points to the centrality of *ligaas* in Tlingit thought and the consequences that follow when ignored. There are a number of very important types of taboos and prescriptions that must be correctly applied to salmon. Complete utilization of salmon and no waste were critical *ligaas* mentioned over and over by interviewees. A number of additional *ligaas* concerning the handling, positioning, and utilization of the salmon have been discussed in the report.

Heen awe a x'eit awdinuk – "Salmon took a drink of fresh water"

A third concept is grounded in the observation of salmon behavior and around which there are a constellation of meanings. In watching as salmon return annually to their home streams, several behavioral and physical changes were observed that are related by Tlingit to the idea that salmon "drink" fresh water. Ken Grant (KGt TR: 12) reported that his father and grandfather both used this concept to convey salmon 1) preparedness for heading up the stream from the bay and 2) the physical changes such as darkening, hooking of male noses, and growth of male humps that are seen on male salmon as they prepare to enter the streams.

Taking a drink of freshwater is also seen as resulting in a decline in salmon fat content as those fish that are darkening and entering the stream are now more suitable for

drying and smoking. For Charles Jack (CJ TR: 8), "swallowing fresh water" means that the salmon has changed physically, and is "rendered out", i.e. lost its fat content. This is most evident in dog salmon, the preferred species for hard drying that will be stored for later winter consumption but also for pinks too. Charles Jack provided the following observation:

> "My grandfather used to say, *'At x'eeshi, yak'eiyi.aa at x'eeshi. Heen awdinaayi.aa awe yak'ei.'* (The dried fish that swallowed fresh water is the best of all)." (CJ TR: 8)

But, according to Charles Jack, it was also true that:

> "*Neen awdinaay.aa. Utlxi sakw, heen awdinaayi.aa yak'ei awe.'* (For boiled fish, the salmon that swallowed freshwater is the best.)" (CJ TR: 8)

It is recognized that sockeye and coho will retain a considerable amount of fat in the streams until later in the winter after they have spawned.

Karl Greenwald noted that dog and pink salmon taken in the estuary or salt water were generally not regarded as being suitable for drying or smoking for winter utilization as their fat content was too high. There was a higher likelihood that they would spoil prior to being completely processed and even if dried or smoked successfully, they would have to be eaten fairly soon after completion as they would not preserve for very long. By contrast, pinks and dogs that were taken in the stream above high water were the best for drying and smoking because of the reduced fat content. These were the ones that were most suited to drying. Mr. Greenwald:

> *"The fish that we're going to keep all winter we let go up the stream. Up the river. And then catch them up the river so they got no more fat in them."* (KGd TR: 25)

Charles Jack observed that the process of hard drying salmon that are taken from the stream insures that they will not spoil during the winter. Processing salmon that still has oil content may result in later moldiness requiring additional processing to save the food (CJ TR: 9).

A closely related phrase *Aa de yaa nahin de* ("the salmon start moving toward the fresh water stream") conveys similar information and indicates that shortly after taking their freshwater "drink" salmon are ready to ascend to their spawning grounds (KGt TR:8).

Jim Martinez of Klawock also spoke hearing this phrase to talk about the changes apparent in salmon in the stream when he was young:

> *"Yeah ... used to hear the old people say that ... when they see the humpies in the creek, well, he tasted fresh water ... That's what they used to say ... my mother used to pay attention to that."* (JM TR: 44)

A striking observation about the physiological affect on salmon of taking the drink of fresh water is provided in the following passage from Thomas Jack:

> *"My dad used to tell us, you watch he said, there's a place where they go in an area where they start changing ... salmon ... he said that salmon is losing their fat ... is going to lose its fat to go up the creek ... while it's losing its fat, it's also putting air into that sack that's in the backside, so you'll see bubbles coming up, and once you get air in that sack, they won't be able to go down too deep more than 10 fathoms at the most. The sack will rupture and it will kill 'em."* (TJ TR: 7)

This process occurs in the estuary in preparation for heading into freshwater and precludes salmon that have gone through this change from returning to deeper offshore waters. It has implications for where a certain quality of fish can be obtained just prior to going up the stream if one knew about and attended to "bubbles."

Finally, "taking a drink of freshwater" was a step in the preparation of salmon to spawn and then to die.

Ish/Ishk'/Nakw Ishk' – "pool, deep pool, our clan's deep pool"

The patterning of salmon movement upstream to their spawning grounds was commented upon by a number of interviewees and the subject of discussion by the Traditional Council of Scholars convened by the Sealaska Heritage Institute. One of the concepts encountered pertains to in stream locations where salmon often congregate - *ish.* The term is translated minimally as "pool" but carries with it implications related to salmon behavior, harvest strategy and technologies as the discussion below fleshes out. Charles Jack uses the term in the following quotation and then defines it:

> "*…a guy says this is a good coho stream. You go looking around and you can't find any. You got to go look around for 'em. Or you find an* 'ish' *where they gather. You can get them there.* 'Ish' *is a kind of pond…most salmon like to rest in them."* (CJ TR: 30)

Tlingit observations of salmon behavior and utilization of in stream habitat over the generations led to a recognition of salmon preferences and the building of a mental model of what those conditions might be.

Sam Hanlon likewise used this concept in his discussion of how Tlingit stream trustees determined whether or not and when to begin salmon harvesting:

> *"And in the river, there's always a big pocket of deep area. That's the deep part of the water."* (SH TR: 14)

Thomas Jack used the concept in several ways – first of all descriptively:

> *"... if you look at a creek, [in] the first part there is a deep place ... and right below is always shallow."* (TJ TR: 14)

Next he goes on to discuss stream geomorphology associated with "holes" – there may be one or more "holes" in a stream and as you ascend from mean high water up the stream, gaffing of pinks and dogs took take place below the first hole:

> *"We'd gaff our fish there ... when we went for dog salmon and humpies ... always below the first hole."* (TJ TR: 42)

Finally, Mr. Jack describes the practice of in stream harvests that are associated with the "first hole" as follows:

> *"There's always a shallow spot there, and that's where they put, they put it off to one side kind of ... see the hole, the deep hole is always off to one side ... so whatever side that deep hole is on the opposite is where they put ...wooden stakes to form a wall…they'd block it off and then they'd throw rocks and chase them down."* (TJ TR: 14-15)

The salmon laying in the first hole above mean high water are driven with rocks into the shallows on the opposite side of the stream where they are harvested.

Tlingit observations of salmon behavior, stream geomorphology and preferred in stream habitat over the generations led to the formulation of the concept of *ish.* It is clearly the concept of *ish* that undergirds the "streamscaping" in the Neva River (described above) by which the present trustees, the Mills family, and their ancestors "took care" of their stream.

Several years ago when conducting place names research with Klawock elder speakers of Tlingit, the term *Nakw Ishk'* was provided as the place name for what I thought was a deep pool in the Klawock River where people presently use fishing poles, lures and perhaps bait to catch salmon, steelhead and dolly varden. But *Nakw Ishk'* is

not the same as the deep hole where sport fishing takes place. James Martinez makes this clear in the following statement about the location at which he speared sockeyes in the Klawock River:

> *"It was before you get to the fish hole. Back about half mile from salmonberry [island] … anyway, that's where we used to have to catch 'em."* (JM TR: 26)

The three terms noted above relate to the notion of a "pool" but not just any "pool" but rather one where salmon congregate. Finally the Klawock place name term that adds the suffix *na* to the beginning designates it as a collectively recognized spot. In previous generations, the *na* designation would mean "our clan's" (Clara Peratrovitch PC) but that implication either has been dropped or converted into a representation of generalized Klawock Tlingit, as opposed to clan (*Ganaax adi*) ownership.

The following additional commentary on *ish* is offered based on the information provided by the Council of Traditional Tlingit Scholars.

First, there is general agreement on the definition of the term as a deep hole or pool of slow moving water in a freshwater stream (either above or below highwater) where salmon congregate. It is seen as a place where they rest prior to resuming their journey. Joe Hotch added that the term might also be used for an eddy – an area along the side of a stream where the current slows and turns back upstream creating nearly motionless water (see Figure 37).

Second, from the elder discussions and interviews, it is clear that the concept is found across the entire range of Tlingit-speaking groups from Hinyaa in the south to Yakutat in the north to the interior Tlingit of Canada. Concerning the latter groups, George Ramos indicated that Tlingit speakers he had met in the Yukon territory also used the concept and referred to themselves as *Ish kahit kwaan*.

Third, elders' discussions and interviews demonstrate that there continues to be a substantial body of knowledge about the specific locations of ish throughout traditional Tlingit territory. These locations often have specific names. These topics could be important to pursue for further research concerning Tlingit traditional salmon knowledge.

Fourth, ish are a favored location from which salmon are captured by Tlingit. Some such locations are typically associated with individuals or families while others are associated with the entire community (Klawock – *Nakw Ishk'*).

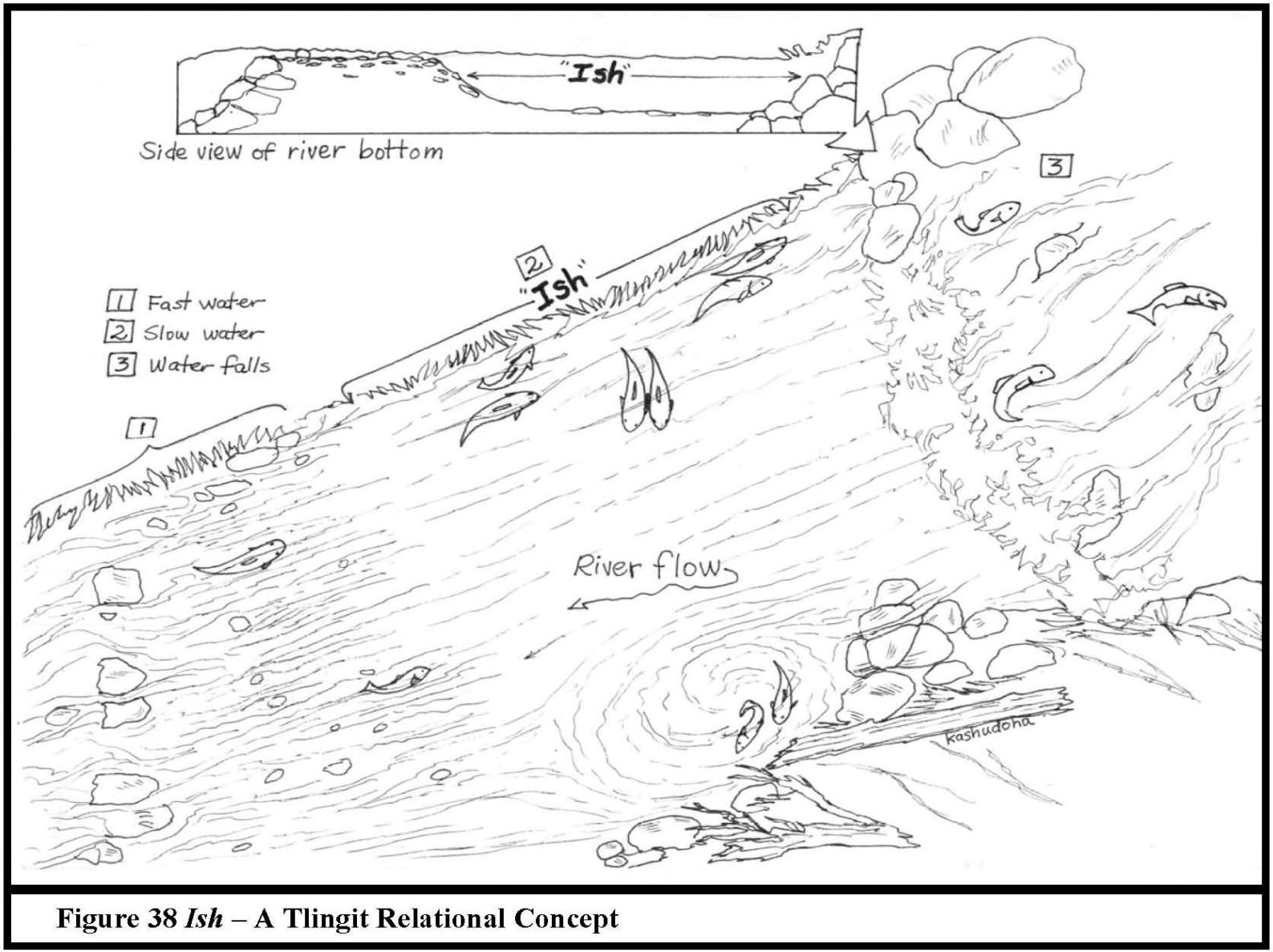


Figure 38 *Ish* – A Tlingit Relational Concept

Fifth, David Katzeek's comments concerning the characteristics of the Chilkat River ish and especially its importance to salmon is of great interest. The perception of the clear water ish in the silty, muddy Chilkat River as deriving from an upwelling spring source is worthy of further inquiry. In addition, the observation that this ish providing purer, more oxygenated water for salmon which provides for rapid re-energization is also of substantial interest.

Finally, Dr. Walter Soboleff's discussion of ish provides excellent overall context on how Tlingit used the concept relationally in constructing their attitudes, practices and uses of salmon. His concept of "pride" speaks to the Tlingit sense of wonder and joy and also to the sense of responsibility for the maintenance of such productive locations. The notion of "pride" may also implicate the practice discussed below of "streamscaping" streams to create more attractive places for salmon. In another setting, Dr. Soboleff referred to the "ish" as salmon "paradise" by which I take him to convey the Tlingit recognition that it is in these habitats that salmon's fulfillment and ultimate existential realization occurs when it rests and meanders in the cool, sheltered, slow-moving water of the *ish* in contemplative anticipation of spawning, death and release into a new existence.

<u>"Take care of the stream"</u>

Widespread among the interviewees is the belief that it is the stream owners or trustees who are responsible for their stream. Responsibility for the interviewees was far more than just harvesting when sufficient abundance was available or determining when, who where, and how fish could be harvested. Responsibility was a far more expansive notion than simply "sitting there and watching it." Thomas Jack clearly articulates this premise in his observations about how the streams of Tenakee Inlet were taken care of by his *Wooshkeetan* ancestors and other families in the following:

> *"And that's how they did it. I used to see each one of the salmon streams around that had smokehouses by them. And it was families' jobs to take care of that creek. And that's what they all do, they all take care of that creek and that's how you take care of it. They don't just sit there and watch it ... now, they make sure it [can produce]"* (TJ TR: 11-12)

Thomas Mills and his family clearly operate according to that belief in regard to the Neva River as has been demonstrated. Like Thomas Jack, Thomas Mills noted that all of the streams that had sizable runs of salmon in *Huna kaawu* were under the jurisdiction of a family who had responsibility for and actively engaged in taking care of their stream.

In late September 2004, I attended a *koo'ex* in Hoonah and inquired of Thomas Mills how the Neva River was doing this year. He said that there had been no rain since late August and the very hot weather had reduced the water level in the upstream dramatically. He then noted that the pool created behind the falls had virtually dried up and that only a trickle was flowing over the rocks. When he was up there, he noticed that salmon were not able to get over the small falls, so he had removed a rock in the area of the water flow which immediately opened the stream up and the salmon below rapidly passed through and continued up the river.

Taking care of the stream can only be accomplished if regular on site monitoring is followed by appropriate action. This is what is meant when Tlingit refer to taking care of a stream. It was the responsibility of the *heen saati* (see above) to carry this out.

Maintain balance

It is clear from the practices described and ideas outlined by Thomas Jack that one of the means by which a stream is "taken care" of is that humans must endeavor to "maintain a balance" among various competing interests. The idea of maintaining a balance is focused on insuring that the best conditions for sustaining appropriately sized runs of salmon are in place. Thomas Jack uses the exact word, "balance" in the following commentary on the responsibility of trustees in regard to the rivers and salmon in their custody:

> *"When we get too many of them [canvasback ducks] we hunt them and get rid of them ... they eat it but they wouldn't throw it away, eat it but just allow so many and I asked him, how come? He said if you kill them all off, the creeks will get overloaded and the creek will die ... Eat so much, so he said you still got to, he said there going to be so many [salmon fry] that are hatching up there because you got rid a lot of the dollies. You only got a few small ones [Dolly varden] left ... and they can't eat all those [salmon] eggs. The salmon has so many ... thousands of eggs, so you got to leave a couple of them* kaax *up there to help them to survive. It's survival ... keep things alive and -- clean out some of the dollies, some of the* kaax *... and all of them ... but certain time, in the spring time, they'd*

> *shoot them birds to eat 'em, but ... by doing that it controls it and keeps the balance of that creek."* (TJ TR: 11-12)

A concept present among several interviewees was that a stream had a certain capacity to support salmon and that it was possible for too many salmon to come back. This was deemed to be injurious to the stream and should not be allowed to happen. In Klawock, Byron Skinna observed another part of the stream guard's role:

> *"He was the boss. They designated him boss because he knew the streams, he knew how much fish it took to reproduce ... so ... it doesn't ... you don't get overkill up the streams ... cause if you get overkill ... it kills the stream ... If you don't get enough,. not enough is better than too much ."* (BS TR: 5-6)

In Mr. Skinna's terminology, "overkill" refers to what happens when too many fish get into the stream. He is characterizing the impact of what contemporary salmon biologists would term "overescapement".

Thomas Jack's observations above convey a similar idea that he makes explicit in the following:

> *"If you let, kill all the dollies and all the* kaax *... the creek will be overloaded with them [salmon], they'll just pick themselves [apart] and they'll die off and there won't be no fish in the creek. So, it's all set on the balance."* (TJ TR: 11)

Thomas Mills' echos this view in his answer to my question about the impact of large numbers of returning salmon to a stream as he observes:

> *"I think that when the fish that went up previously spawn their eggs and stuff and these ones come up later and there's a lot of them over there, they just start digging up the eggs that are already spawned."* (TM TR:33)

"Think in long range…history"

The underlying principles of the Salmon Boy mythic charter and the behaviors based on it are aimed insuring that human people act appropriately toward salmon people. Through those mutual actions "the long range" can be accomplished (JO TR). The "relationships can be sustained" hence **relational sustainability.** Interviewees believed that improper behavior toward could result in salmon not returning to that stream. However, the disappearance of salmon was not solely or totally the result of poor human behavior. Nevertheless, the long range can only be envisioned and accomplished by appropriate behavior as informed by the precepts of the Salmon Boy mythic charter.

"Aatkeeyat'xi" – "Lake baby"

While human beings have responsibilities for taking care of streams and maintaining balance, several Tlingit interviewees spoke of a being called *Aatkeeyat'xi* that resided in the freshwater lakes where sockeye salmon live. Thomas Jack provides the following account concerning this being:

> *"Old timers got a story about the lake, they call it* Aatkeeyat'xi. *He lives up in the lake. … that's just telling us where the sockeye spawn or if they don't spawn there, they don't spawn in the creek. But their babies come in and get underneath that fur and stay there for the winter. That's the way they survive* Aatkeeyat'xi**.** *If you look at a* T'akteintaan *regalia you'll see it on their back. There's a [blanket] back that[shows]* Aatkeeyat'xi. *So somehow, what it is, the old man said is a big ...monster or something alive, and he said you heard it over in Pavlov [Harbor]. Something hitting the water, real loud ... he[father] said, "holy cow," I said, "What's that?" He said that, 'oh, that's just* Aatkeeyat'xi. *He's just cleaning himself up, getting ready for his babies to come back. He said, when he was beatin' himself up, he was shakin' all the mud off, gettin' ready for his babies to come back. Yeah, kind of like hair. He [father] said, he [father] wanted to go up and see it, and his dad [grandfather] wouldn't let him. He [grandfather] said, 'nah, leave her alone ... she's takin' a bath, she's cleanin' himself up ... gettin' ready for her babies.' He [father] said, 'that's where the sockeyes go when they're born, they swim into her and she takes care of them for the winter.'"* (TJ TR: 20)

Figure 39 ***Aatkeeyat'xi*** **- "Lake Baby".** ***T'akdeintaan*** **blanket regalia demonstrating the** ***Aatkeeyat'xi at.oow*** **of the Sockeye House. Photo courtesy of John Martin.**

Mr. Jack's father was the leader of the Sockeye House of the *T'akdeintaan* in Hoonah. He no doubt observed the regalia he describes on more than one occasion at memorial potlatches given in Hoonah. The piece of regalia to which Mr. Jack refers is shown in Figure 39. The *Aatkeeyat'xi* is represented by the figures in the top and bottom middle of blanket. Two sockeye salmon, with their "persons" represented by the face at the junction of the tail and body, are faced up and outward. The sockeye fry are represented by the two eye forms on either side at the bottom of the blanket. In September, 2004, a similar blanket was utilized in a *T'akdeintaan koo'ex* in Hoonah memorializing a deceased female member of the Sockeye House.

Wudzixen – turning white as an indicator of age.

This term refers to fish getting "white" referring to the growths of fungus that appear on the sides of salmon at the stream mouth or in the stream proper. Charles Jack indicates that this in turn means "It's getting old" (CJ TR:18). The condition is viewed as primarily occurring in pink and dog salmon. According to Thomas Jack (TJ TR: 28), such fish can still be eaten.

"Vegetables"

One Hoonah interviewee commented that the grass or "greens" in the stream were salmon food that helped them to be healthy. Lily White commented:

> "*We call it*, héenshakwxhéeni (grass in the freshwater). *When the salmon are moving, when they are starting to go up the streams,,,* Héenshakwxhéeni yoo duwasaagu át áwé has a xaa nuch ya héen taa dax. (*The salmon ate grass near the streams.)* Axoo.aa tlel ax ugeinuch ya…ya river yix'. *(Some of the grasses were small.)* Ach áwé axoo.aa tlel ulgeix' nuch. *(That is why some salmon weren't very large.)* A héenshakwxhéeni yoo duwasakw at has axaayí ya river yíx' geiyi…ya héen yíx' geiyi…aagaa a tsu nalgeix'ch wé fish. *(When this grass is large and plentiful, the salmon are also large.)* As axaa nuch ya héen taax' yei…*rivers* yíx' yeinateech. *(They ate the grass growing in the streams.)* Akax áwé yaa yaga.eich wé xaat. *(The salmon sought this particular grass.)* It's like the white people say, vegetables." (LW TR: 40-41)

Mrs. White's description of salmon consumption of grass in the streams appears

to differ from conceptualizations about salmon and grass held by Yakutat Tlingit. De Laguna (1972) reported that her Yakutat sources indicated that salmon did not like to encounter grass at the mouth of streams and that they avoided it.

There is a difference between the two cases in that the grass Mrs. White of Hoonah refers to is in the stream proper while the Yakutat accounts deal with estuarine grasses whose presence drives salmon away.

Comparison: *Huna* and *Hinyaa;* Tlingit and Western

Examination of the information provided by Tlingit interviewees in Hoonah and Klawock shows that there are many areas of similarity and some significant differences between the two in dealing with salmon. The fundamental social and cultural organization of clans, leaders, property, ownership, responsibility, crests, kin principles, ceremonial practice and reciprocal relations in feasting among Tlingit are apparent in both areas. Additionally, in relations specifically with salmon, important areas of similarity are outlined below.

HUNA and *HINYAA* Comparison

- Salmon Boy mythic charter as a basis for understanding and relating to salmon particularly in regard to their annual return;
- Similar use of concept of "respect" as foundational to relations with salmon in order to insure their return;
- Some form of social or group ritual consumption of salmon associated with initial harvesting;
- Similar harvesting of salmon in zones of availability including spawned out fish such as trolling, weirs and traps, and in stream harvesting;
- Similar emphasis on the primary taking of males;
- Similar preference for male pink salmon for specialty food;
- Similar use of heads and eggs for specialty products;
- Similar ideas concerning control of excess number of dolly varden and certain ducks as protection for salmon eggs;
- Similar use of the concept of *ish* (pool) within a stream as a significant locus of assessment;

- Similar use of the concept of "took a drink of water" to account for changes in salmon physiology between saltwater and freshwater environments;
- Similar ideas about each stream having an appropriate number of spawning salmon;
- Mention of underground stream systems that support salmon in both areas;
- Later onset of sockeye salmon returns now than in the early 20th century mentioned in both areas;

Important areas of difference include:

- Focus on intertidal, primarily estuarine, technologies and fish traps that capture salmon only on ebb tide among the *Hinyaa* absent among the *Huna*;
- Use of the gaff among the *Huna* and the spear among the *Hinyaa;*
- Much more frequent reference to changes in stream characteristics resulting in altered species presence among Hoonah interviewees;
- Identification of king salmon as formerly present in many streams in *Huna kaawu* but not such mention for *Hinyaa kwaan;*
- Identification of a number of former and/or unknown small sockeye systems in *Huna kaawu* not paralleled in *Hinyaa kwaan;*
- Identification of several runs of salmon falling outside (both earlier and later) the "normal" period of salmon arrival mentioned for *Huna kaawu*;
- Identification of specific, recurrent anomaly termed "white spots" appearing in flesh of pinks, and perhaps king salmon, among *Hinyaa* interviewees but not by *Huna* interviewees;
- "Streamscaping" identified and practiced among *Huna* but not among *Hinyaa;*
- "Beachscaping" identified and practiced among *Hinyaa* but not among *Huna;*
- Movement of local salmon stocks from nearby stream to re-establish destroyed runs in recent times reported by *Huna* but not by *Hinyaa.*

<u>Tlingit and Contemporary American Comparison</u>

Comparing the positioning of salmon in Tlingit and contemporary American societies reveals that the two systems are starkly different. The primary difference derives from radically disparate cosmological assumptions, premises and mythic charters. For Tlingit, salmon were "persons" whose return was premised on respectful treatment by humans

and fulfillment of a sacred ritual act. This practice of **relational sustainability** is premised on shared sociality and engagement. Salmon were at the center of Tlingit practice in the world and among themselves. For Euroamericans, salmon are fish, not persons, whose return depends on escapement in sufficient numbers into quality habitats accompanied by positive oceanographic circumstance, primarily dictated by meteorological conditions. This practice of **resource renewal** is premised on materiality and management. Thus Tlingit action is spiritually informed to produce the reincarnation and return of an attentive, sentient, volitional being while Euroamerican action is materially informed to manage conditions to allow a minimally sentient, non volitional fish to reproduce.

There are other substantial differences between how Tlingit and Euroamericans relate to salmon beyond the fundamental cosmological foundations of belief. Salmon are central and essential to survival for Tlingit as a foodstuff but they are a small part of the consumption of the contemporary regional population. Salmon were a critical ceremonial food that was gifted more than exchanged for value among Tlingit but salmon have little or no ceremonial position and are overwhelming commercially exchanged for value rather than gifted among Euroamericans. Behaving disrespectfully, unnecessarily harming and not attending to salmon as persons were proscribed among Tlingit while "sport" fishing, catch and release fishing and treating salmon as domesticates and commodities are prescribed among Euroamericans.

Tlingit overwhelmingly harvested salmon as discrete stocks locally in estuaries and lower portions of streams while Euroamericans overwhelmingly harvest salmon as mixed stocks nonlocally in straits and inlets. Tlingit trustees assessed stocks in stream and took care of streams on a case by case basis through visual inspection and personal contact while Euroamericans assess stocks in aggregate, have little direct contact with salmon in streams and do little monitoring of specific stream characteristics. For Tlingit, responsibility for salmon welfare was a moral duty of specific persons keyed to specific stocks while for Euroamerican institutions, responsibility for salmon welfare is a legal obligation of institutions where persons have little or no sense of responsibility and stock assessment is keyed primarily to aggregate numbers. Tlingit focused harvests on males to insure that maximal numbers of females were able to spawn while Euro-

Table 8 Salmon in Tlingit and Contemporary American Practice

SPIRITUALITY AND ENGAGEMENT	MATERIALITY AND MANAGEMENT
Cosmology – spiritual, salmon are recycled through appropriate ritual engagement and action as described in mythic charter.	**Cosmology** – material, salmon die and sexually produced offspring return; non-human life to be managed for human use as specified in mythic charter.
Position – critical to survival, central in cultural practice and must be taken care of.	**Position** – important but can be ignored or traded off for other things like dams, roads, wood products.
Behavior – show respect as you would a human being; never speak badly to or about.	**Behavior** – use for food, recreation without regard to feelings of salmon.
Economy – overwhelmingly subsistence but some ceremonial and exchange use also.	**Economy** – overwhelmingly commercial, secondarily recreational with minimal subsistence and personal use.
Harvest location – overwhelmingly estuary and stream-based with majority of salmon taken in stream and after spawning.	**Harvest location** – overwhelmingly saltwater straits and bays, minimal estuary and instream harvesting, no after spawning use.
Gender – males preferred, females only taken for eggs to be used for food.	**Gender** – no selectivity in harvest, females preferred due to commercial sale of eggs.
Use – Don't waste, use all of salmon and process all parts into consumable forms.	**Use** – Waste not of concern, most of salmon not used for food and discarded.
Products – enormous range of consumable foods from fresh to dried, predominantly hard dried, also food from heads and eggs; other non-food uses of salmon parts as well.	**Products** – considerable range of consumable foods from fresh to frozen, predominantly fresh or frozen, non-food uses minimal.
Institutional oversight – clan ownership with decision-making by inherited trustees with long-term relation to stream.	**Institutional oversight** – primarily government with decision making by non-local employees with no historic ties and minimal local knowledge.
Stream relations – trustees responsible for stock assessment, harvests, and taking care of stream. May include taking of species detrimental to salmon and minimal alteration of stream characteristics to mimic positive conditions for salmon.	**Stream relations** – no specific personal responsibility; employees not on site and make minimal observations. Some guidance on stream protection but often not enforced.
Productivity – some evidence of stock transplants to re-establish runs damaged by natural events; "streamscaping" also.	**Productivity** – seek to enhance natural stocks with hatchery runs to replace stocks overharvested due to commercial fishing.

americans practice no gender selectivity in harvest and commercially value females with eggs more than males, minimizing incentives to see females spawn. The table on the previous page summarizes key dimensions of difference found between Tlingit and contemporary Americans in their relations with salmon.

Questions

Several important questions arise concerning the information presented in the preceding sections of the report. These can be divided into those that pertain to recent practices (pre and postcontact) and those that pertain to the longue dureé (thousands of years) of Tlingit residence in southeast Alaska and their relations with salmon through time.

Recent Practices and Observations

The close, intimate and multigenerational ties of Tlingit to specific streams that previously characterized salmon relations have been nearly destroyed in the past century. Where families have been able to maintain those close connections, the richness of knowledge about a stream, its salmon and the changes that have occurred at various times in the past are impressive. At the same, new ideas have also been introduced to Tlingit observers in the past several generations and the question arises which practices reported and observed represent continuity with precontact Tlingit practice?

Predominantly male harvests appear to be a striking finding of the report that likely represents continuity with precontact practice. Preferential males harvesting was widely reported by interviewees in both Hoonah and Klawock. The dual justifications provided by the interviewees of maximizing female egg deposition and obtaining greater returns from processing effort strongly complement each other.

Several questions relate to the nature and practices associated with stream trustees' activities. A continuum was present in the interviews observations from a limited role to an expansive role for *heen saati* (stream trustees). A generally agreed on baseline role for trustees included stock assessment, authorization of legitimate harvesters, declaring when harvesting could occur, cessation of harvesting and harvest locations. The minimal role of trustees does not encompass any "taking care of" the stream in terms either of the dangers posed by other species to salmon or of insuring that stream characteristics such as obstructions were removed or of endeavoring to improve conditions for salmon. The opposite end of the continuum would include activist trustees

who eliminated certain salmon predators (especially those who consume fertilized eggs or immature salmon), removed obstacles and impediments to salmon reproduction and finally, who undertook to make improvements in the streams related to perceived salmon needs. There are various positions on the passive versus active continuum that result from combining attitudes and actions associated with different elements and conditions.

General monitoring of stream conditions related to the impacts of dolly varden, ducks and beaver dams on salmon seems likely to represent continuity with a more activist precontact practice. Dolly varden and duck dangers and harvests were reported by both Hoonah and Klawock sources; there were fewer mentions and less agreement about beaver impacts. While governmental managers have periodically expressed concerns about dolly varden and beaver impacts on salmon, ducks are generally not regarded as significantly impacting salmon abundance. The trap designs for dolly varden and the special huts for taking ducks both appear to represent continuities from precontact practice. The evidence for whether active stream management of beaver dams was a previous Tlingit practice is not as strong.

Another substantial issue related to trusteeship is the extent of "streamscaping" engaged in by various Tlingit groups. The specific features constructed on the Neva River clearly are grounded in observations that have been crystallized into conceptual construction and term – *ish* (pool) provided by numerous interviewees in both Hoonah and Klawock. The act of modifying stream conditions by moving materials to provide better conditions for salmon appears to be a small incremental step in trusteeship but one that is built on recognition of salmon habitat preferences. Additional research with elders, especially those with longstanding ties to specific streams and geographic areas is needed to more fully address this question of how widespread such activities were.

Beyond "streamscaping" as an activist strategy is the question of stock transfers and there use to re-establish salmon populations in streams or to change the timing of runs to streams. Several instances of stock movement were noted by interviewees and at least one other instance has been documented in the literature related to the activities of Herman Kitka, of the Sitka *Kagwaantaan* (Thornton 2000). Activism in stock transfer might be an important contributor to salmonid presence by assisting in the replacing stocks in streams that have experienced slides, blockage or other disruptions.

A final trustee issue concerns the actual number of streams to which Tlingit paid attention and toward which they acted as trustees in "taking care of them". Interviewees who grew up under the tutelage of elders within traditional clan territories demonstrate familiarity with a wide range of streams in their areas. Streams that are most likely to have received the greatest oversight are multispecies systems, particularly those with sockeye and coho runs due to the availability of fish from these systems late in the winter. Nevertheless, smaller systems were likely given attention within the lower stream sections where the overwhelming proportion of dog and pink salmon spawning occurs.

Two species distribution questions arise from the observations of Hoonah interviewees. The first of these concerns king salmon; were there small runs of king salmon in a large number of streams in *Huna kaawu* prior to the coming of the commercial troll fishery? The second question concerns sockeye salmon; are there a number of small sockeye systems that are presently unknown and do such systems disappear and reappear as a result of changes in stream and lake conditions?

Another interesting question arises concerning the recurrent "white spots" in the flesh anomaly reported by the Klawock interviewees and the lack of such observations among the Hoonah interview. Are these related to differential geographic distribution of parasites or are there other implications at present unknown related to these differing conditions?

Longue Dureé Questions

The nature of Tlingit knowledge and practices documented in this report suggest important questions about Tlingit impact on salmonid productivity during the last 6,000 years.

Does preferential male harvesting make a significant difference in producing either higher yields or more stable yields?

Do various predator and disruptor (beaver) control programs make a measurable difference in salmonid species distribution and abundance levels?

Has trusteeship contributed to long term stability of salmon returns to specific streams? Is it possible to determine if it has created more beneficial conditions for salmon abundance or altered in any specific direction the conditions for salmonid reproduction?

Did *Huna* Tlingit attempt to establish king salmon in systems through stock transfers?

Did Tlingit attempt to establish sockeye in lake systems through stock transfers?

Does "streamscaping" accompanied by monitoring contribute to increased spawning habitat?

What impact does "beachscaping" have in terms of creating intertidal estuarine habitats – specifically pools and depositional contexts for intertidal floral communities?

How widespread were "streamscaping" and "beachscaping" and what impact has such engineering had on streams and intertidal zones in terms of salmonid productivity?

Does careful in season attention to stream conditions such as blockage, deadfalls, and access impediments increase productivity?

Can it be determined if the totality of Tlingit practice has contributed to salmonid abundance in southeast Alaska in general, for specific locations or for specific species?

Implications for Research and Practice

Future research on traditional knowledge of salmon by Tlingit should be extended into other areas of southeast Alaska in order to explore what additional dimensions of knowledge and practice might exist that are related to local conditions and traditions. Special attention should be paid to the larger mainland river systems of which the Chilkat River looms as a key opportunity for extending knowledge. This would allow a more comprehensive understanding of the extent to which the information presented in this report is widely applicable. It is also likely that practices associated with larger river systems with multiple tributaries will be different to some degree from the practices documented in this report that primarily relate to smaller island streams.

Such research should include a significant component of on site guided interaction between researchers and Tlingit experts deriving from the clans who are the traditional trustees of streams and areas. On site photography and filming of stream characteristics and commentary should be a priority. Researchers must have the ability to provide open-ended opportunities for perspectives, information and knowledge to be presented by the expert consultants to maximize the possibility for unprecedented understandings to emerge.

Research on longue dureé questions concerning Tlingit and salmon are also warranted. Such research would require an interdisciplinary approach involving archeology, paleobiology, salmonid genetics and geomorphology at a minimum. The complex network of beliefs, concepts, structures, behaviors, geomorphologic forms and biological communities that are the result of long term Tlingit engagement could well yield dramatic new understandings about cumulative and the construction of highly productive stream systems.

Are there implications for the present practice of human – salmon relations in southeast Alaska that arise from this research? Clearly there are. But the lack of commensurability between the systems of knowledge, control and practice between the Tlingit way and the government/commerce/science way make them difficult to implement.

Tlingit practice suggests that attention to in season, in stream conditions by trustees to establish a balance between over and under harvesting is important to the long term health of a system. A program could be established to re-institute such trusteeship by identifying local Tlingit with longstanding ties, knowledge and interest in a stream to assume those duties. Their observations on local conditions could contribute to improving in stream conditions. Trustees could also provide observations on spawning numbers and success. Such a program would forefront the Tlingit manner of valuing local knowledge and using it for the benefit of the salmon and local people. There are other social and cultural values associated with re-establishing local ties and a sense of local responsibility for salmon.

Pilot projects to eliminate all stock interception and focus harvests on estuaries should be implemented to explore the possible shift of harvest and utilization back to the stream. In this way, each stream becomes important and the human relationship to each stream and its salmon becomes important to the overall health. Specific rather than aggregate, and intimate rather than abstract knowledge becomes privileged.

Can sockeye stocks in the outer coastal region where they no longer exist be re-established using Tlingit procedures of stock transfer? Can sockeye stocks that are weak be rehabilitated by the transfer of stocks from nearby systems – notably *Haaktaheen* on Yakobi Island?

Can “streamscaping” according to Tlingit models of preferred salmon habitat be a more natural form of enhancement, under local control, than hatcheries? Suppose the hatchery budgets were shifted to the trustees with the authorization to “take care of” streams and return them to balance? What would be the long term outcome for improvement of damaged stocks, re-establishment of stocks, maintenance of genetic diversity, and enhanced community welfare through personal efficacy and responsibility of a return to Tlingit engagement and practice?

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Transcripts and tapes are presently stored at the University of Alaska Anchorage under the supervision of Steve J. Langdon

Huna

Name	Abbreviation	Transcript or Tape	Interview Year
Dalton, Deborah	DD	(TR)	2003
Grant, Kenneth	KGt	(TR)	2003
Greenwald, Karl	KGd	(TR)	2003
Hanlon, Sam	SH	(TR)	2003
Jack, Charles	CJ	(TR)	2003
Jack, Thomas	TJ	(TR)	2003
Martin, Al and John	AJM	(TR)	2003
Mills, Thomas	TM	(TR)	2003
Osborne, James	JO	(TR)	2003
Rudolph, Mary	MR	(TR)	2003
White, Lily	LW	(TR)	2003
Williams, Frank O.	FW	(TP)	2004

Hinyaa

Name	Abbreviation	Transcript or Tape	Interview Year
Ermeloff, Fanny	FH	(TP)	2003
James, Benjamin	BJ	(TR)	2003
James, Gordon	GJ	(TP)	2003
Martinez, James	JM	(TR)	2003
Peratrovitch, Clara	CP	(TR)	2001, 2003
Peratrovitch, A. and I.	AIP	(TP)	2003
Roberts, T. and A.	TR	(TR)	2003, 2004
Rowan, Jonathan O.	JR	(TP)	2003
Skinna, Byron	BS	(TR)	2003
Williams, Ronald G.	RW	(TR)	2003
Woods, Joanna	JW	(TR)	2003

APPENDIX A

Klawock Tlingit Salmon Traditional Use and Knowledge Interview Guide

"The purpose of our interview today is 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 Klawock Cooperative Association and the Klawock School District to assist in the continuance of Klawock *Hinyaa* cultural heritage. The research is funded by the US Fish and Wildlife Service, Office of Subsistence Management. They are the federal agency responsible for insuring subsistence rights in Alaska. They will receive a copy of our final report as will the Klawock Cooperative Association."

A. DEMOGRAPHIC INFORMATION

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

Maiden name_____ Clan _____ House_____

Clan house crest_____ Tradition house location_____

Date of birth_____ Location of birth_____

Number of years in Hoonah_____ 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 decided 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 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 Klawock 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 come to Klawock, 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 Klawock 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 *ligaas* establishes for Tlingit what they should not do. What are examples of this concept in regard to salmon – what shouldn't people do?

At.oow – were there specific songs, dances, blankets, or other regalia for salmon or for salmon from certain rivers/streams?

G. *YAA.AWUNE* (RESPECT)

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 Klawock Tlingit 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 Klawock 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 clans keep track of how many salmon were being harvested from a particular stream?

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

Were clans concerned about <u>too many</u> 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 clans ever limit the number of salmon that could be taken from a stream by members of their own clan?

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

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

Other related questions

What is the relationship between steelhead and other salmon?

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

Are there any stories from before Europeans arrived about stone or wood traps in the estuaries?

APPENDIX B
HOONAH TLINGIT SALMON KNOWLEDGE AND UTILIZATION INTERVIEWS: TRANSCRIPT STATUS

NAME	CLAN	TRANSCRIPT	TLINGIT	TRANSLATE	REVIEW
Austin, James	*Chookaneidí*	No	Some	No	No
Dalton, Deborah	*Chookaneidí*	Yes	Substantial	Yes	No
Dalton, George	*T'akdeintaan*	No	None	NA	No
Grant, Kenneth	*T'akdeintaan*	Yes	Substantial	Yes	Yes
Grant, Katharine	*T'akdeintaan*	No	None	NA	No
Greenwald, Karl	*T'akdeintaan*	Yes	None	NA	Yes
Hanlon, Sam	*Wooshkeetan*	Yes	Substantial	Yes	Yes
Jack, Charles Sr.	*Wooshkeetan*	Yes	Substantial	Yes	No
Jack, Thomas	*Wooshkeetan*	Yes	Minimal	Yes	Yes
Kaze, Esther	*T'akdeintaan*	No	Some	No	No
Lafferty, Anita	*Shungukeidi*	No	Some	No	No
Marks, James	*Chookaneidí*	No	Minimal	No	No
Martin, Al and John	*T'akdeintaan*	Yes	Substantial	No	No

NAME	CLAN	TRANSCRIPT	TLINGIT	TRANSLATE	REVIEW
Mills, Thomas	*T'akdeintaan*	Yes	Minimal	No	Yes
Osborne, James	*Chookaneidí*	Yes	Substantial	Yes	No
Rudolph, Mary	*Chookaneidí*	Yes	Some	No	No
St. Claire, Adeline	*Decitan*	No	Some	No	No
White, Frank	*Kagwaantaan*	No	Some	No	No
White, Lily	*Chookaneidí*	Yes	Substantial	Yes	Yes
Williams, Frank O.	*T'akdeintaan*	No	None	No	No

KLAWOCK TLINGIT SALMON KNOWLEDGE AND HARVEST INTERVIEWS: TRANSCRIPT STATUS

NAME	CLAN	TRANSCRIPT	TLINGIT	TRANSLATE	REVIEW
Ermeloff, Fanny	*Kakoshitaan*	No	No	No	No
Jackson, Al	Wolf (?)	No	No	No	No
James, Benjamin	*L'eeneidi*	Yes	Some	Yes	No
James, Gordon	*L'eeneidi*	No	No	No	No
Kato, Ernestine	*Kachadi*	No	No	No	No
Martinez, James	*Yenyeidi*	Yes	Minimal	No	Yes
Peratrovitch, Clara	*L'eeneidi*	Yes	Substantial	No	No
Peratrovitch, Irene and Alec	*Shunkweidi Ganaax adi*	No	No	No	No
Roberts, Theodore and Alicia	*Shunkweidi Ganaax adi*	Yes	Substantial	No	No
Rowan, Oliver	*Taku'anedih*	No	No	No	No
Skeenay, Byron	*L'eeneidi*	Yes	No	No	Yes
Stevens, Millie	*Kagwantaan*	No	No	No	No

NAME	CLAN	TRANSCRIPT	TLINGIT	TRANSLATE	REVIEW
Williams, Ronald Sr.	*L'eeneidi*	Yes	No	No	No
Woods, Joanna	*Kakoshittaan*	Yes	No	No	No

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ANALYZING HISTORICAL & CONTEMPORARY FISHERIES POLICY

A Science Literacy Unit: Student Packet



Overview

This course will investigate the challenges and opportunities created by Alaskans fisheries through an exploration of the combination of current management and traditional stewardship. Students will practice reading, writing, listening, and oratory strategies while developing an understanding for western and Tlingit science. This multi-week, seven-lesson unit focuses on the interdisciplinary study of the oral narratives, “Salmon Boy” and “Eagle Boy Harvest” to establish equity in science, math, and literacy. Students will learn fundamentals and relevant terminology in fish and wildlife issues in Southeast Alaska as they student fishing technology and gear, Pacific salmon habitats and life cycles, historical and contemporary fish and wildlife policy. The student will be challenged to assess their individual philosophies of fish and wildlife policy and programs as they engage in projects, case studies, field investigations, and research to answer the questions , “how should local knowledge influence future policies?”

Standards Addressed in this Unit

Themes (*parallels AP Environmental Science Content as found at http://apcentral.collegeboard.com/apc/public/repository/ap-environmental-science-course-description.pdf and Juneau School Districts science content standards*)

Science

1. Science as Inquiry and Process
- Science is a method of learning and constantly changes the way we understand the world
  SA1.1 Students ask questions, predict, observe, describe, measure, classify, make generalizations, analyze data, develop models, infer, and communicate
  SA1.2 Students recognize and analyze multiple explanations and models, use information to revise student's own explanation or model if necessary
  SA2.1 Evaluate credibility of cited sources when conducting the student's own scientific investigation
  SA3.1 Conducts research and communicates results to solve a problem

2. Energy conversions underlie all ecological processes
- Energy cannot be created; it must come from somewhere
  SC3.1 Relate carbon cycle to global climate change

c. The Earth itself is one interconnected system
- Biogeochemical and natural systems vary in ability to recover from disturbances
  SC3.2 Analyze potential impacts of changes

d. Humans alter natural systems
- Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment
  SD3.1 Describe causes, effects, preventions, and mitigations of human impact

e. Environmental problems have a cultural and social context
- Understanding the role of cultural, social, and economic factors is vital for solutions
  SE1.1 Research how social, economic, and political forces strongly influence which technology will be developed

f. Human survival depends on developing practices that will achieve sustainable systems
- A suitable combination of conservation and development is required
  SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science

Language Arts

a. The student restates/summarizes and connects information.
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information

b. Student analyzes content of text to differentiate fact and opinion
R2.9 a. Differentiate between fact and opinion. b. Express opinions about text with support

c. Student connects and evaluates cultural influences/events.
R3.10 Compare and contrast how texts reflect historical and cultural influences.
R4.9 Analyze the effects of cultural and historical influences on texts.

Cultural Standards

A.2 Students will recount their own genealogy and family history
B.4 Identify appropriate forms of technology and their use for improving community
D.3 Interact with Elders in a loving and respectful way that demonstrates and appreciation of their role as culture-bearers and educators in the community
E.2 Understand the ecology and geography of the bioregion they inhabit

Unit Objectives:

As a result of this unit students will understand:

- As different cultures have opposing views about resource management, regulating fisheries is a controversial topic for our state
- Local policy makers, enforcement agencies, and enhancement hatcheries: Alaska Department of Fish & Game (ADF&G), National Oceanographic Atmospheric Association (NOAA), National Marine Fisheries Service (NMFS), and Douglas Island Pink and Chum, Incorporated (DIPAC, Inc), United States Fish and Wildlife Service (USFWS)
- The differences and similarities of traditional stewardship and current management
- Local ecosystems, habitat, life cycles, and human impacts that affect Pacific salmon

As a result of this unit students will be able to:

- Analyze and evaluate information related to Alaska fisheries and express ideas both in writing and orally.
- Examine how moving from an attitude of land stewardship to resource management has impacted Tlingit culture.
- Evaluate the value of functioning in a western world (literacy and advocacy) as well as counting to uphold tradition.

Tlingit Educational Significance

- Students benefit from listening to elders and cultural specialists. An elder or cultural specialist should be invited to tell *Salmon Boy & Eagle Boy* in their own words to ensure accuracy, clan proprietorship, and complexity of the oral narratives.
- Tlingit heritage language speakers can teach Tlingit vocabulary and phrases related to stewardship, management, coastal ecology, and other factors that influence fisheries.
- This unit will validate Tlingit understanding of the ecology and geography of the local bioregion and the significance of oral narratives for promoting ethics and responsibility.
- This unit will enable Alaska Native students to understand the Tlingit ingenuity of their ancestors and will help non-Native students better understand landscape ecology and cultural history.

Culminating Project or Event

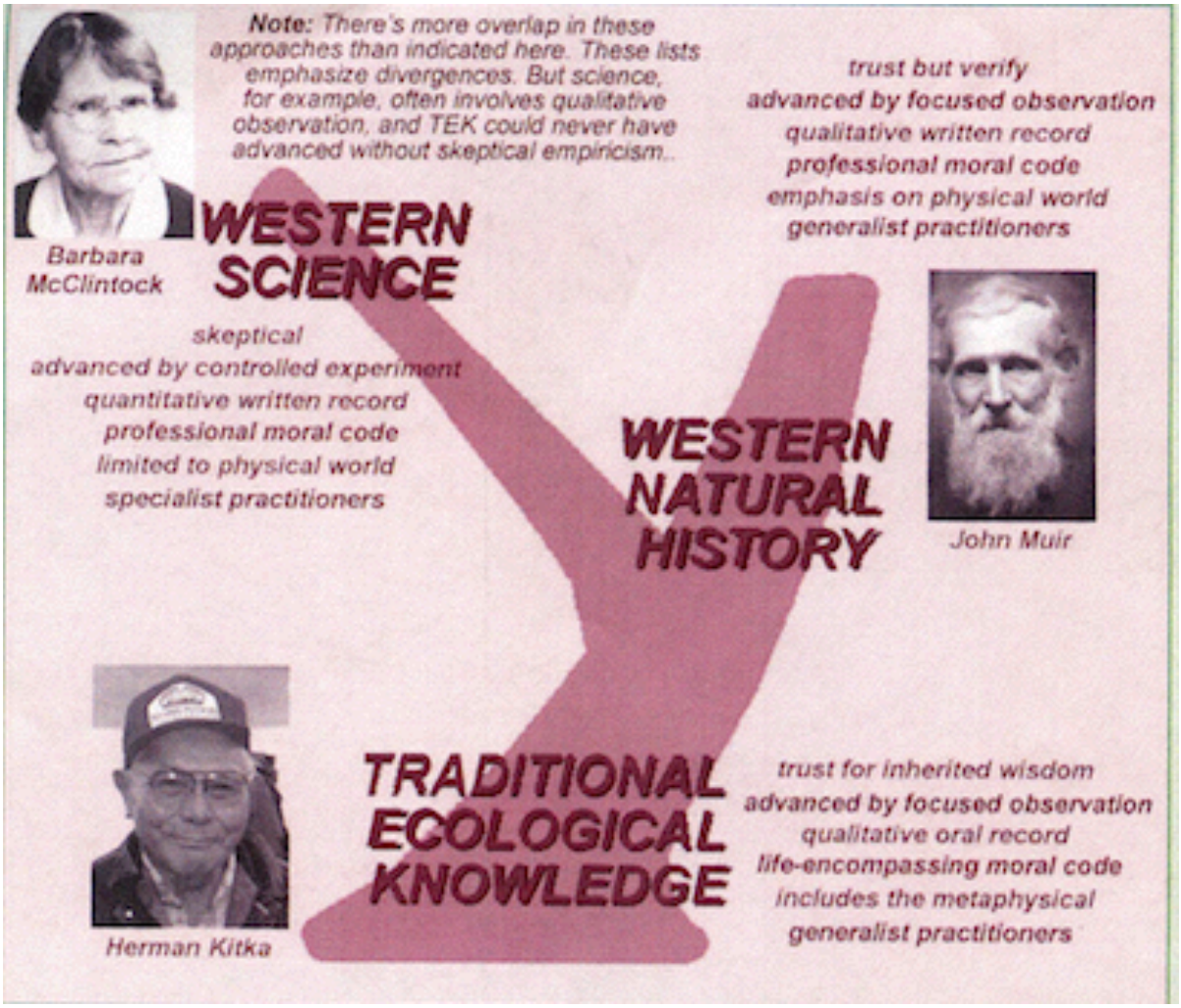
- Groups create co-management plan with accompanying outreach and education visuals (can be informational pamphlet, podcast, iMovie, or Garage Band productions if time and resources are available).
- Present visuals and plans to elders, cultural specialists, community professionals, and extended family members and offer them traditional food to thank them for their support in the classroom.

Supplemental Materials & Suggested Texts

This unit consists of project rubrics, concept maps, student worksheets, PowerPoints, and articles.

- Haa Shuká, Our Ancestors: Tlingit Oral Narratives. Nora Marks Dauenhauer and Richard Dauenhauer. 1987. Volume 1.
- Haa Atxaayí Haa Kusteeyíx Sitee, Our Food is Our Tlingit Way of Life. Excerpts from Oral Interviews. Richard G. Newton and Madonna L. Moss. USDA 3rd Edition.
- Alaska Native Science: A Curriculum Guide. Dr. Dolly Garza, the Alaska Native Knowledge Network. 2011.
- "Traditional Knowledge and Harvesting of Salmon by Huna and Hinyaa Tlingit" Final Report (102 pages of incredible information for use with this unit)

Overview of Lessons	Literacy Strategies	Academic Vocabulary	Assessments
Lesson 1: Nature of Science *Science is a Process* Students explore the convergence of western and traditional science through guided reading, discussion, and reflection writing. • Student Page: "Ways of Knowing" article • Student Page: "Western science & traditional knowledge" article	• Guided writing • Quick-write • Think-Pair-Share • Mark the text • Paraphrasing	• traditional ecological knowledge • western science • empiricism	• Journal Prompt • Peer Reflections
Lesson 2: Stewardship & Management *Science is a Process* Students practice problem-solving strategies as they create graphic representations of abstract concepts regarding historical and contemporary fishery policy. • Student Page: What is an oral narrative? • Student Page: Copy of *Eagle Boy Harvest* • Student Page: Stewardship & Management Table	• Graphic representation • Generating questions • Annotations • Quick-write • Paraphrasing	• oral narrative • cultural context • permits • regulations • enforcement • stewardship • management	• Article summary & annotation (peer review) • Class Venn Diagram • Table
Lesson 3: Co-management Introduction *Humans alter natural processes* Students are introduced to the unit's culminating activity expectations to use the problem-solving strategy of working backwards to find the answer. • Student Page: Aak'w Kwáan & Taak'u Kwáan Map • Student Page: Final project scoring guide	• Note-taking • Generating questions • Debriefing • Quick-write • Work backward • Graphic Representation	• co-management • conservation/ management plans • local resources	• Table • Journal Prompt
Lesson 4: Run & Abundance *Humans alter natural processes* Students make predictions, run a simulation, generate questions, and discuss the challenges of estimating stock abundance of Pacific salmon. • Student Page: Predicting Uncertainty Table	• Note-taking • Generating questions • Discussion group • Graphic Representation	• population dynamics • fecundity • run • recruitment • escapement • abundance	• Table
Lesson 5: Salmon in the Trees *The Earth is one interconnected system* Students explore the concept of keystone species and the energy transfer of the different components of ecosystems through the combination of Tlingit oral narratives and academic journals. Students will work together to identify key components of local coastal food webs through stream quality testing. • Student Page: Copy of *Salmon Boy-Moldy End* • Student Page: Storyboard • Student Page: Free Response Quiz • Student Page: Fish Policy PowerPoint • Student Page: Excerpts from TEK & Fishery Article	• Quick-write • Think-Pair-Share • Mark the Text • Oral Reading • Note-taking • Paraphrasing	• water quality • dissolved oxygen • pH • fishing gear • fermentation • food preservation	• Free Response Quiz • Article Summary
Lesson 6: TEK in Research *Human survival depends on sustainable practices* Students will demonstrate understanding of the importance of ancient knowledge in today's changing world as they prepare for the final presentation. • Student Page: Interview Template (Short Project) • Student Page: Anadromous Waters Catalog (GIS)	• Think-Pair-Share • Note-taking • Work backwards	• Geographical Information System (GIS) • Anadromous	• Interview • Final project prep
Lesson 7: Sharing Our Ideas *Science is a Process* • Student Page: Final presentation	• Graphic representation • Paraphrasing	• respect	• Final project



WAYS OF KNOWING

In recent years, there have been many attempts to explore the similarities and differences between traditional Ecological kNowledge (TEK) and Western Science (WS), mostly in an attempt to reconcile these sometimes diverging world vies, and to arrive at ways for each to respectfully inform the other.

Here, we introduce a third element to the dichotomy between WE and TEK-the discipline of Natural History (NH), as exemplified by naturalists such as John Muir. over time, as WS has taken over the role of original research, naturalists have tended to move into the role of interpreters, synthesizing and community the findings of scientists to the public.

In the graphic above we present the relationships between TEK, NH, and WS as a tree. Position on this tree-crown vs roots, etc-is not intended to signify superiority of one over the other. But a progression over time is suggested. Our challenges is to be sure the roots of the three don't wither as the branches proliferate.

Examining the attributes of these 3 approaches to knowledge, we suggest that old-style Natural History and TEK may be more closely related to each other than either is to WS. Today's naturalist may use GPS and digital photography, but philosophically, s/he may be closer to the root than the crown of the tree. The naturalist and the Tlingit hunger or spruce-root gatherer are generalists, whereas the scientist is increasingly specialized. Although the discipline of natural history is not bound to a life-encompassing morel code or spirituality, many individual naturalists are deeply spiritual. John Muir saw in nature the expression of God. With science, the advancement of knowledge becomes more formalized. In its strictest definition, science involves hypothesis generation, followed by rigorous, quantitative experimentation. Because skepticism is at the core of this testing, science distance itself from the metaphysical (i.e. the untestable). Of course, individual scientists may be religious, but most would claim that their untestable beliefs are not permeated to bias their scientific objectivity.

In science, except for professional ethics, there is no right or wrong-only the incremental pursuit of truth, mostly through hypothesis generation. Scientists don't hope to *arrive* at the ultimate Truth; they're more interested in chipping away at truth with a small "t."

By: Richard Carstensen of Discovery Southeast

EMBO reports

Western science and traditional knowledge

Despite their variations, different forms of knowledge can learn from each other

Fulvio Mazzocchi

Cultures from all over the world have developed different views of nature throughout human history. Many of them are rooted in traditional systems of beliefs, which indigenous people use to understand and interpret their biophysical environment (Iaccarino, 2003). These systems of managing the environment constitute an integral part of the cultural identity and social integrity of many indigenous populations. At the same time, their knowledge embodies a wealth of wisdom and experience of nature gained over millennia from direct observations, and transmitted—most often orally—over generations.

The importance of this traditional knowledge for the protection of biodiversity and the achievement of sustainable development is slowly being recognized internationally (Gadgil *et al*, 1993). For example, Article 8 of the Convention on Biological Diversity urges us to "...respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity...." (United Nations, 1992). In addition, traditional or indigenous knowledge has been rediscovered as a model for a healthy inter- action with, and use of, the environment, and as a rich source to be tapped into in order to gain new perspectives about the relationship between humans and nature.

However, our difficulty in approaching the knowledge from indigenous cultures is already reflected in the way in which we describe and name it. No universal definition is available, and many terms are used to establish what indigenous people know (Berkes, 1993), including traditional knowledge or traditional ecological knowledge, local knowledge, indigenous knowledge or science, folk knowledge, farmers' knowledge, fishers' knowledge and tacit knowledge. Each of these terms carries different implications, and there is an ensuing discussion about which one is the most appropriate. The word 'traditional', for example, places the emphasis on the transmission of knowledge along a cultural continuity, but might ignore the ability of traditional societies to adapt to changing circumstances. Another widely used word, 'indigenous', is meant to highlight the autochthonous nature of this knowledge, but it might overlook knowledge from populations who are not officially recognized as indigenous. The word 'local' can be applied to different geographic contexts, but it lacks specificity. At present, traditional ecological knowledge is interpreted as a cumulative body of knowledge, practices and representations that describes the relationships of living beings with one another and with their physical environment, which evolved by adaptive processes and has been handed down through generations by cultural transmission (Berkes *et al*, 2000).

Many indigenous populations have relied for centuries or even millennia on their direct environment for subsistence and autonomy. Over time, they have developed a way in which to manage and use their resources that ensures their conservation into the future. Such traditional societies are interested more in preserving their own social, cultural and environmental stability and integrity than in maximizing production. Consequently, there is no 'exploitation' of nature —which they do not consider as a collection of commodities—in the interaction between humans and natural milieu. On the contrary, their way of life is based on a strong sense of

interconnection and interdependence. This also applies to their social life. Ethics is explicitly part of the traditional approach. Relationships are based on reciprocity and obligations towards community members. Natural resource management is based on shared meanings and knowledge (Berkes, 1993). Activities in traditional societies often include a strong symbolic dimension in which every action is highly ritualized, and allow humans to participate in the preservation of the natural order. Of course, these rituals differ between cultures, as each society has its own belief systems, which determine its cultural identity and type of technology.

Traditional knowledge has developed a concept of the environment that emphasizes the symbiotic character of humans and nature. It offers an approach to local development that is based on co-evolution with the environment, and on respecting the carrying capacity of ecosystems. This knowledge—based on long-term empirical observations adapted to local conditions—ensures a sound use and control of the environment, and enables indigenous people to adapt to environmental changes. Moreover, it supplies much of the world's population with the principal means to fulfill their basic needs, and forms the basis for decisions and strategies in many practical aspects, including interpretation of meteorological phenomena, medical treatment, water management, production of clothing, navigation, agriculture and husbandry, hunting and fishing, and bio- logical classification systems (Nakashima & Roué, 2002). Beyond its obvious benefit for the people who rely on this knowledge, it might provide humanity as a whole with new biological and ecological insights; it has potential value for the management of natural resources, and might be useful in conservation education as well as in development planning and environmental assessment (The World Conservation Union, 1986).

Of course, I am not trying to assert the ideal of the 'noble savage'. Not all indigenous people have lived or are living in peace and harmony with nature; history has seen many cultures disappear after they had exhausted the environment's ability to sustain their population, such as the Maya or the Anasazi in the Americas. However, many existing traditional practices are ecologically healthy, and we can- not simply dismiss them as primitive and unscientific belief systems.

In all cultures, humans have gained knowledge by conceptualizing empirical observations to better understand nature, and thus interpret and predict it (Iaccarino, 2003). The problem is how to study and analyze indigenous knowledge and belief systems. Of course, we cannot depend only on their empirical aspects, but must embrace their specific world views. It is not possible to simply reduce them to practical knowledge that is exclusively based on experience as opposed to theoretical knowledge, which is developed through deductive or inductive reasoning. In any case, discovering the fundamental principles of dealing with nature in many far-off cultures is not an easy task. Western science—which is deeply rooted both in the philosophy of Ancient Greece and the Renaissance—and traditional knowledge systems have developed radically different strategies to create and transmit knowledge, and it is exceedingly difficult to analyze one form of knowledge using the criteria of another tradition.

Still, there is a vast body of literature on such comparisons between Western science and traditional knowledge systems, which has identified various characteristics and opposing views. Western science favours analytical and reductionist methods as opposed to the more intuitive and holistic view often found in traditional knowledge. Western science is positivist and materialist in contrast to traditional knowledge, which is spiritual and does not make distinctions between empirical and sacred (Nakashima & Roué, 2002). Western science is objective and quantitative as opposed to traditional knowledge, which is mainly subjective and qualitative. Western science is based on an academic and literate transmission, while traditional

knowledge is often passed on orally from one generation to the next by the elders. Western science isolates its objects of study from their vital context by putting them in simplified and controllable experimental environments—which also means that scientists separate themselves from nature, the object of their studies; by contrast, traditional knowledge always depends on its context and particular local conditions (Nakashima & Roué, 2002).

In general, traditional knowledge systems adopt a more holistic approach, and do not separate observations into different disciplines as does Western science (Iaccarino, 2003). Moreover, traditional knowledge systems do not interpret reality on the basis of a linear conception of cause and effect, but rather as a world made up of constantly forming multidimensional cycles in which all elements are part of an entangled and complex web of interactions (Freeman, 1992). Of course, there is always the risk of oversimplifying by reducing the things of interest to essentials and/or dichotomies. However, from this brief overview of the dissimilarities, we can gain an understanding of how hard it is
to compare two systems of knowledge that are so profoundly different. Trying to analyze and validate traditional knowledge systems by using external (scientific) criteria carries the risk of distorting such systems in the process. At the same time, we cannot extract just those parts of traditional knowledge that seem to measure up to scientific criteria and ignore the rest. This process of cognitive mining would atomize the overall system and threaten traditional knowledge with dispossession (Nakashima & Roué, 2002).

However, Western contemporary culture and philosophy does offer some interesting ideas as to how to deal with these problems. The Austrian- born philosopher Paul Feyerabend, for example, questioned the widespread assumption that only Western science holds the criteria to determine the truth. As Feyerabend pointed out, any form of knowledge makes sense only within its own cultural context (Feyerabend, 1987). Similarly, the British anthropologist Gregory Bateson has compared knowledge about the material world to a map and the terrain it describes: the map itself is not the terrain, but only one representation of it (Bateson, 1979). Just as different maps can give accounts of the same terri- tory, so too can different forms of knowledge about the material world. Its actual representation ultimately depends on the observer's view.

Contemporary hermeneutics—a branch of philosophy concerned with the theory of existential understanding and interpretation of texts—and, to a certain extent, complex thinking can offer useful approaches to compare different forms of knowledge and rationality. Complex thinking has provided new insights, and has contributed to a renewed interpretation of the concept of nature, and a new paradigm of science and epistemology. This new approach has brought a greater awareness of the short- comings of simple explanations in comprehending reality. It aims to overcome the limits of both reductionism and holism by integrating them into a wider perspective, which investigates the complex structure of interconnections and retroactive relationships in the real world.

According to the classic epistemological approach, the creation of knowledge is a process of qualitative refinement and quantitative accumulation. Its goal is to disclose the ultimate foundation—the 'meta' point of view from where we can see the ontological order and the objective truth—and to provide a neutral and universal language to explain natural phenomena (Ceruti, 1986).

Complex thinking has strongly questioned this notion of a meta point of view along with its heuristic value as a principle for the creation of knowledge. Instead, it seeks and analyses the web of relation- ships among different perspectives. This is continually redefined in a dynamic

process involving multiple points of observation and explanation. These places are fundamentally incommensurable, yet they can complement each other and be part of a constructive network. What matters, in fact, is the possibility of including multiple viewpoints that are vicarious in building a cognitive universe and can disclose a more complete picture of reality.

In this context, the hermeneutical notion of a 'horizon' as expressed by the German philosopher Hans-Georg Gadamer seems to be highly relevant: "Horizon is the range of vision that includes everything that can be seen from a particular vantage point" (Gadamer, 1960). Rationality intrinsically works from this point, which starts the process of comprehension through which we can interact with other and different horizons, and ultimately expand our own knowledge horizon.

The encounter between different cultures and knowledge systems can then be regarded as an encounter between different macrohorizons; such systems come from different traditions, and each has its own way of understanding phenomena and its own 'logic' that allows the observed phenomena to be placed within an overall vision. Nevertheless, all representations of reality are expressions of the same cognitive features that are inherent in human nature.

Traditional environmental knowledge is an important part of humankind's cultural heritage—the result of countless civilizations and traditions that have emerged over human history. This cultural diversity is as important for our future as is biodiversity. It is a potential source of creativity and enrichment embodied in several social and cultural identities, each of which expresses its uniqueness (United Nations Educational, Scientific and Cultural Organization, 2002). However, European colonization has eroded and destroyed much of this traditional knowledge by replacing it with Western educational and cultural systems. The trend towards a global culture might even worsen this situation and enhance a process of cultural homogenization.

Scientific knowledge has long held a central role and attained a dominant position in our developed societies, but we cannot ignore the fact that other valid knowledge systems exist. The imposition of Western scientific ideas and methods not only causes disruption to existing social and economic relationships, but also might spoil the local knowledge. Allowing science to be the final arbiter of the validity of knowledge, and to establish the threshold beyond which knowledge is not worthy of its name, would create the conditions whereby an astonishing cultural heritage is transformed into a monolithic structure. Instead, we would be better advised to recognize the value of this heritage, and to devise strategies for its preservation for the benefit of present and future generations.

First, a renewed approach to dialogue among cultures is required. Such a dialogue can only take place if there is a common principle shared by all participants. All humans from all cultural backgrounds have the same biological nature. At the same time, however, a dialogue is only possible because there is diversity at various levels. Eliminating these differences or staying in rigid isolation eliminates the conditions needed for a potentially mutually beneficial converse.

By acknowledging the uniqueness of each knowledge system, we can go well beyond a mere pluralist approach to knowledge. Dialogue can become a tool for social cohabitation, as well as for dis- covering and enhancing knowledge. It should be based on a sense of profound hospitality because it arises from different identities and traditions, which are interested in exchanging their perspectives and experiences. This should not be anathema to Western science—in fact, it is through dialogue that new insights have emerged from the ancient Greek academies to today's laboratory meetings and scientific conferences. In this sense, a dialogue

can catalyse the development of shared meanings, which are key factors in binding people and societies together as vehicles of social cohabitation (Bohm, 1996).

The real world is too complex to be compressed into static conceptualizations. Dealing with this complexity requires approaches and strategies that maintain a continuous openness and willingness to discover and learn (Morin, 1990). This dialogue should take place with the unknown and the otherness. By shifting our perspective, and looking at other paths to knowledge that humans have developed and lived, we might create the necessary conditions for hitherto unknown knowledge to be revealed. All of these perspectives describe the human experience of reality. We need to open ourselves to participating in the experience of others, and yet we should also be aware that this opening can only start from where we already are—from our point of view or the tradition to which we belong. Our historical and culturally embedded perspective has been described by Gadamer as the "initial directedness of our whole ability to experience" (Gadamer, 1967). Nevertheless, from our delimited horizon we can still accept the invitation of other paths to knowledge and might well learn from them.

For example, some authors (Freeman, 1992; Iaccarino, 2003) have suggested that traditional knowledge systems can be helpful in dealing with complex systems: "The understanding of complex systems remains a major challenge for the future, and no scientist today can claim that we have at hand the appropriate methods with which to achieve this. Thus, we can- not discuss the future of science without taking into account the philosophical problems generated by the study of complexity. Modern, or Western, science may not be best suited to fulfill this task, as its view of the world is too constrained by its characteristic empirical and analytical approach that, in the past, made it so successful. We should therefore remember the contributions of other civilizations to the understanding of nature. [...] Such traditional or indigenous knowledge is now increasingly being used not only with the aim of finding new drugs, but also to derive new concepts that may help us to reconcile empiricism and science" (Iaccarino, 2003).

There is little doubt that modern science can gain a lot from such a dialogue. It has been extremely efficient in studying specific aspects of the natural world— those that are achievable through observation and experimentation—but operates in an environment that is either strictly con- trolled, such as a laboratory, or highly simplified. This approach is crucial in order to make generalized claims about the validity of scientific propositions, because it allows hypotheses under the same or highly controlled conditions to be tested and verified. However, an increasing number of critical voices argue that an approach based on reductionism—as helpful as it has been in the past—might no longer be sufficient to analyze and understand higher levels of complexity (Kellenberger, 2004; van Regenmortel, 2004). Moreover, scientists work only at specific levels of analysis. The theories formulated at each level are based on key observations, and, therefore, can explain only a specific set of facts (Iaccarino, 2003). Hence, the integration of methods and results from different approaches and levels of analysis can become essential.

These considerations seem to be particularly relevant for studying biological, eco- logical and social phenomena that include different levels of complexity. As already mentioned, the Western tradition of thinking is developing a different approach to gaining knowledge from complex systems, but it would be equally useful to learn how traditional approaches explain such complexity. Not only are they more holistic, but also they seem to be better suited to coping with the uncertainty and unpredictability that are viewed as intrinsic characteristics of natural systems. Western science and traditional knowledge constitute different paths to knowledge, but they are rooted in the same reality. We can only gain from paying attention to our cultural history and richness.

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What is an Oral Narrative?

Tlingit oral narratives contain many layers which enrich our knowledge and imagination. On one level, these stories are great entertainment. Some Tlingit narratives explain how aspects of our world came to be. Other oral narratives relate epic adventures of specific clan ancestors. Stories involving Raven often include humorous exploits which may lead us to reflect upon respectful treatment of others. However, oral narratives were not told solely for entertainment.

Many oral narratives have been written down. Some are written down exactly as they are told and therefore sound like the storyteller. Others have been changed over time to sound more like stories. Oral narratives are best when you can see and hear the storyteller who can make an oral narrative come to life.

In the past, oral narratives were used to convey many forms of knowledge. Oral narratives teach about place names, property, geography, and science. From these stories, younger generations would learn about food preparation, the ebb and flow of the tides, and behavioral patterns of hunted mammals. Many of these stories assisted in the teaching of life skills such as navigation an obtaining food from the land. In addition, oral narratives were used to convey traditional values and social responsibility: They explore human nature and may involve concepts of identity, alienation and isolation, coming of age, loyalty, pride, loss, and other conflicts humans experience throughout life. These stories are spiritual, intellectual gifts which have been passed down from esteem ancestors. Like all good literature, Tlingit oral narratives can be used to enhance content learning in the classroom. These stories can be used as a springboard to teach history, geography, science, mathematics, Tlingit heritage language, reading, writing, and more.

The Gift of Tlingit Stories

When you hear a Tlingit story it is a gift. You may be hearing a story that does not belong to you. This story may be over one thousand years old. The story might even tell about the history of the clan who owns it. Be sure to show respect for this gift. Listen with your heart and show appreciation for the story teller.

Types of Tlingit Stories

- Oral Narratives
- Songs
- Dances
- Totem Poles

Paraphrase in your own words the significance of oral narratives:

_____

_____

_____

_____

Note: *Tlingit oral narratives are the property of specific clans. Many stories require permission before they are shared.*

The Eagle Boy Harvest story this unit refers to is from the Haa Atxaayí Haa Kusteeyíx Sitee, Our Food is Our Tlingit Way of Life (pages 32-34) as compiled by Richard G. Newton and Madonna L. Moss and as told by John C. Jackson of Kake. The story is property of the Wooshkeetaan clan of Aak'w Kwáan.

"This is the story of an orphan boy. Eagles build their houses in trees; people call them eagle nests because in the eyes of human beings it is a nest. To the eagles it is a house and a home."

There was a young boy who became an orphan. His father and mother died, all his uncles also. He had only one pair of grandfolks still living. They were quite old and not able to get around, but they were his only living relatives, so they looked after him. As he grew old enough he was able to get around and he realized he would have to do something for them because there were so old. If they were going to eat, he would have to get some food. So one of the first things he did was to look around. Out in the vicinity of Auke Village there was a reef. While rowing around there one day he discovered there was food there and he gathered some up and brought it ashore. His grandfolks thought this was wonderful, so in turn, they told him to be very careful. They instructed him to always tie the rope around his waist, which he did religiously.

One day the leather used for rope somehow untied itself from the bow of the boat. The other end was still attached to his waist. When he discovered the canoe had floated quite a ways from him, he did not know what to do. He was a small boy and did what was natural for a boy. He hollered for help and when he did not see any response he cried. After he stopped crying he stood there and thought. The tide would soon come up, so he began to gather rocks and pile them up one at a time. He made steps so that as the tide came up he would be able to climb to the top of the pile and stay above the water. This he did.

All of a sudden he heard a strange noised coming from above him. It was a commotion made by the noise of wings. When he looked up he saw a large eagle descending on him with its claws extended and ready to pick him up. He could not believe it when his feet left the ground but he did not put up any resistance.

The eagle finally let him down gently in front of what was to be his eagle family home. One of the eagles noticed this strange creature on their premises so right away he opened the door and asked very loudly "what is this human being doing in our yard?" He overheard the conversation in Tlingit. The eagle said to his father, "this is a human being I saved from drowning out on one of the reefs out there. The tide was overtaking him, do not harm him. Let me say that again, ***do not harm him!***" He stayed in the eagle community for years. He was well provided for with food, it was like living at home.

From all appearances the eagle that saved the boy looked like an attractive young woman. Finally she spoke to her father saying, "he is my future husband, I want you to know this." This future wife of his talked with him at great length and gave him much advice. She asked him, "do you see the shirts that are hung on the wall? They all have power…but in varied degrees." She pointed to the sixth shirt and said, "that is the best one. It is the one with the most power…and it is called *Ka.aan galshaat*. My father is going to give you a gift. If he gives you a choice, make sure and choose *Ka.aan galshaat*." This is literally translated to mean lifting a whole town. Then she went on to say this is why, when an eagle gets its talons into its prey…it stays.

One day not long after, her father said, "I want to give you a gift." He showed him the shirts on the wall and said "yo are to choose on of the shirts that you see on the wall." The boy did not waste any time saying, "I will take that sixth shirt." Then the wise eagle father said, "that shirt is *Ka.aan galshaat*. The fourth and the third shirts do not have that much power but it is good for you not to have too much power at the very beginning. You would make a mess of it if you had too much power to work with before you had any experience. That is why I will give you the third shirt; you will be able to see with keen mind and eye, your prey approaching the surface of the water. This will be give to you

first of all. The eagle *kwáan* will bestow fortune upon you through my daughter. I want you to try out this third shirt and see what you can do."

He put the shirt on and went up on top of a high tree. He could see many, many things as clear as could be. He saw a fish come to the surface so he went out. His father-in-law told him, "now you just do not fly any old way, you fly the way the sun rises and sets, east to west. Do not forget this." So he picked his prey up, which was a black bass.

The second day he repeated the same ordeal of going up in the tree and looking around. When he saw an object coming to the surface he was all prepared for it, he had it timed so that just when he got to it, it was coming to the surface so he picked it up and brought it home. There he put it in front of his future father-in-law. It was a red snapper. The third day he went out and got a gray cod and brought it home.

The following day he went out and saw a hair seal and got his talons on it and this particular time the seal got away. So he went home and told his tale of woe about hosing his kill. He said I lost it because I was not strong enough. So his father-in-law gave him the fourth shirt.

He went out and caught the same seal and there was nothing to it. He caught a porpoise the following day and towed it ashore. He came across the same problem though later on when he lost a sea lion because he could not hang on to it. So his father-in-law gave him the final shirt and also a lecture about what a valuable shirt it had been for the many, many years it had been handed down. It had been handed down from generation to generation and people had become wealthy as a result of these shirts. "No doubt if you are obedient and ambitious and work hard you will be able to become one of the wealthy people. Now I have one word of caution. Try and keep greed out o this. Do not overkill. Kill only one at a time."

So he went out and made his first kill which was a sea lion. He towed it ashore. He caught many things and became a wealthy man and just before he retired, he though to himself, "well, I will go out for the last time." He caught a whale and looked around and saw another one very close by. He decided to kill that one also. He closed the two holes where it breathes on top and by doing that he was able to get the air in there and get them to float. During the night he towed them both ashore, just barely making it. He was about to make the last stroke when the raven crowed and the young man died.

Eagle Boy StoryBoard-As Told by John Jackson (Originally from the *Wooshkeetaan* clan of the Aak'w Kwáan. Story transcribed from tapes in Haa Atxaayi Haa Kusteeyix Sitee, Our Food is Our Tlingit Way of Life.)

Name: _____

After reading the story about "Eagle Boy" on page 32-34, compare and contrast current management of resources with traditional stewardship. Search for quotes in the oral narrative that address stewardship of resources and copy them into Column 1. In the second column paraphrase the action indicated by the quote. Next, insert one of the following components of contemporary management (~~permits~~, consequences, monitoring, enforcement, regulations/ laws). Finally, in the last column, summarize how the two methodologies are connected.

TRADITIONAL STEWARDSHIP & CONTEMPORARY MANAGEMENT ***Eagle Boy Story***			
Quote	**Traditional Stewardship**	**Contemporary Management**	**How Are They Connected?**
Example: *One day not long after, her father said, "I want to give you a gift." He showed him the shirts on the wall and said "you are to choose one of the shirts that you see on the wall."*	Example: Hunting privilege given by Eagle Father	Example: **Permits** Have to apply for fishing & hunting licenses	Example: Hunting is a privilege or responsibility to be earned

Aak'w Kwaan and Taak'u Kwaan map created by Richard Carstensen of Discovery Southeast based off of Haa Léelk'w Hás Aaní Saax'ú: Our Grandparents' Names on the Land. Edited by Thomas F. Thornton. 2012.

Final Project Rubric: *Co-management Plan (including Outreach & Education Visuals)*	**Name:** **Group Members:**	
Grading Criterion (3 points/each)	No	Yes
Preparation: Student utilized regulation guidelines and project rubric to organize & plan their work.		
Focus on Task: Used time well, focused on the project, worked well with others.		
Essential Question: Created an original, interesting way to address the essential question in their presentation.		
Audience Awareness: Design, vocabulary, audio, and graphics fit target audience		
Voice Consistency: Voice quality is clear and audible throughout the presentation		
Voice Pacing: The pace fits the information presented and draws the audience into the story.		
Narration: Each member narrates a section within the presentation. Tlingit and English names of resources are given.		
Imagery: Appropriate use of images for education and outreach visuals.		
Detail: Presentation has exactly the right amount of detail-not too short or too long.		
Purpose: Establishes purpose early and maintains that focus throughout.		
Duration: Group presentation is between 3 to 5 minutes in length.		
Requirements: Product includes all required elements.		
Total Points (36 points available):		

Predicting with Uncertainty

*Full-detailed lesson from Dr. Dolly Garza's Alaska Native Science: A Curriculum Guide (pages 27-49)

Write hypothesis: _____

Group Members:				
	# of Green Beans	# of White Beans	% of Green	Overall % Green
draw 1:				
draw 2:				
draw 3:				
draw 4:				
draw 5:				
Total:				
____ green out of 50 = > _____ out of 10 (how does this match your hypothesis?)				

Rewrite hypothesis: _____

Group Members:				
	# of Green Beans	# of White Beans	% of Green	Overall % Green
draw 1:				
draw 2:				
draw 3:				
draw 4:				
draw 5:				
Total:				
____ green out of 50 = > _____ out of 10 (how does this match your hypothesis?)				

The Salmon Boy or "Moldy-End" story this unit refers to is from the Dr. Dolly Garza's Alaska Native Science: A Curriculum Guide (page 71) as told by Andrew P. Johnson, 1975.

The Kiks.ádi were drying their salmon. After they had gotten through drying it they tied it up. Nearby a small boy was bating a snare for seagulls. He came into the house very hungry. "Mother, I am hungry. Can I have some dried salmon." So she gave him a piece of dried salmon which had begun to mold in the corner. Then he said, "How come you always give me moldy-cornered ones, they're not as good!"

Just then someone shouted out, "There is a seagull in your snare." So he ran down to the water to his snare. When he got to the snare he was pulled down into the ocean. The people began hunting for him, but he was nowhere to be seen. It was not known what happened to him.

It was the salmon people that had done it, they went out to sea with him. They went seaward with him toward their homes. To him it looked as if they were in a canoe. A chief among these salmon had made him his son. He was among them for one year.

The salmon people all knew the salmon month had come up here which was their month for returning. They always spawn up here among us. They started back with him.

Now they saw his father coming down from up the creek. They said to the boy, "Stand up." He jumped up. "Very fin," said his mother. His mother called him a fine salmon. After that the salmon swam up the creek.

The salmon tribe shouted "Go to your mother." His mother was cutting salmon on the beach. Then she called her husband's attention to it. "A fine salmon is swimming here with its head out." His father took up a hook, for he did not know that it was his son.

At once he swam out in front of his father. When the father had hooked it he pulled it out on a sandy bar. He hit it on the head in order to keep it fresh. Then he threw it to his wife. "Cut it up. We will cook it." So she put the salmon don to cut it up in the usual manner.

The Tlingit obtained copper in ancient times. A chain of twisted copper was around the salmon's gills, for he had gone into the water with it on. She had tried to cut around the gills but her knife hit metal. Then she called out to her husband, "Come here." They began to examine it and found the copper that hung around her son's neck.

As soon as he saw this he threw the fish into a finely woven basket. He spit upon it and blew eagle's down onto it. Then he put the basket enclosing the salmon on the roof of the house. Toward morning there was a noise inside it. The boy's spirit began to work inside of it. At daybreak he went up to look at it, and his son lay where the salmon had been.

The sea gull which he had tried to snare had become his spirit. The son showed his people how to respect the salmon and to not waste even the moldy ends.

FREE RESPONSE

There is a coastal year-round nestled in a protected cove surrounded by steep, high mountains in Southeast Alaska. There are many other beings this community interacts with in the surrounding area including herring, salmon, ptarmigan, clams, mountain goat, and seal. Community members respect the brown bear by traveling to a nearby seasonal site each summer to prepare food. Cedar and spruce trees offer shelter, weaving, and building materials. When picking the site, villagers paid close attention to risks such as avalanche zones and ensured visibility of the channel. The community is thriving and doubles their population 50 to 100 families as clans from neighboring areas intermarry.

Other people nearby in a new city noticed the great herring and salmon runs near this community site and start to bring their boats out to the cove to fish and bring home food to their families. These people fish differently with nets capable of catching fish by the tons. The families in the city have plenty of food and their population starts to grow fast. The villagers notice that there are less fish each year, and start to think about what might be causing the change by observing what they see and remembering stories from the past. The community members discuss the necessary permissions of taking fish from clan protected waters with the folks from the city, but the over harvesting continues. Some people are moving to the community cove to be closer to the fishing and using the nearby trees to make their homes. Both groups of people have the same needs: food, water, shelter, and space. What will happen to all of the people, animals, and vegetation?

(2013 AP Environmental Science Free-Response Question-modified)

1. *Biological diversity, or biodiversity, has become a topic of great concern among conservationists. Biodiversity is often used by scientists and policy makers to help determine the health of ecosystems. Write a free-response (short essay) to answer the following questions).*
   - **A.** *What abiotic and biotic factors influence the community site.*
   - **B.** *Describe TWO characteristics shared by ecosystems that have high biodiversity.*
   - **C.** *identify TWO specific human activities that result in a loss of biodiversity, and* ***explain*** *how each activity lowers biodiversity.*
   - **D.** *For each human activity you discussed in C,* ***propose*** *a practical strategy (other than simply banning the activity) to reduce the loss of biodiversity.*
   - **E.** ***Describe*** *ONE naturally occurring factor that could lead to a change (loss or gain) in biodiversity.*
   - **F.** ***Describe*** *TWO ecological benefits that greater biodiversity provides.*

Glacier Bay Science Symposium

Traditional Ecological Knowledge of Tlingit People Concerning the Sockeye Salmon Fishery of the Dry Bay Area

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Abstract

The Yakutat Tlingit Tribe and the National Park Service have collaborated to document Tlingit traditional ecological knowledge about salmon ecology and fisheries management in the Dry Bay/Alsek River Delta. Historically Northwest Coast Peoples including Tlingit have managed fishing and fish populations. Each Tlingit clan or house managed and controlled specific rivers or in larger river's sections of rivers in southeast Alaska. Traditional beliefs about reincarnation of animal spirits and a kinship with animals contributed to how Tlingit traditionally treated and handled salmon and animals. In recent decades, sockeye salmon have dramatically declined in the Dry Bay/Alsek area. It is hoped that this study, by showing how the Tlingits historically understood and managed sockeye habitat, population and harvest in the Dry Bay/Alsek area, will aid in developing a restoration plan.

Introduction

The East Alsek River in Dry Bay has undergone a drastic decline in sockeye salmon return, affecting an important subsistence resource. A four-part multidisciplinary study combining western science and Traditional Ecological Knowledge (TEK) was designed to understand this decline and potentially remedy. This study was the first part of a larger four-part study design and gathered TEK from the Yakutat – Dry Bay area (northern Southeast Alaska) on traditional practices utilized by the Tlingit clans of Gunaxoo (Dry Bay).

Results

Dry Bay, Alaska is located along one of the most dynamic regions of the Alaska coast. Dry Bay is the delta of the Alsek River, which flow's 240 miles from the Yukon to Dry Bay. At least twice in recent history the Lowell Glacier dammed Alsek River and formed Lake Alsek, which was about 200 m deep and over 100 km long. This area was settled first by the Athabaskan Indians, then by the Tlingit. Trading routes led from the Dry Bay region overland to the Yukon and Klukwan, Alaska area.

Salmon was a major resource utilized by the Yakutat Tlingit. From late spring to Fall-time, Tlingits went to various streams and rivers to harvest salmon. Traditional beliefs about the salmon spirits and human's relationship to their environment governed how Tlingits related to and treated salmon. Only by following certain customs and rituals would a hunter or fisherman be allowed to harvest animals. The "Salmon Boy" story taught Tlingits the proper behavior toward salmon and about salmon behavior.

Traditionally, each clan "owned" and managed specific areas for hunting, fishing and berry areas. It was the clan leader (chief) along with his council, that determined when fishing was opened, where the traps were to be placed, who's allowed to harvest and how much they are allowed to harvest. If a man was caught violating any of the rules, his hunting equipment was taken away from his and sometimes his spear was broken up. Yakutat elder's related how Chiefs used to monitor the salmon, open and close fishing on the Situk River using a white flag and direct the cleaning of the river.

Discussion and Conclusions

Traditional Tlingit Knowledge of Salmon in Yakutat and Southeast Alaska is based on thousands of years of collective observation and interaction with salmon. Traditional methods of management based on local control by clan, fishing methods and allocation of resources is different from contemporary methods were fishing sites are now privately owned, traditional fishing method are not used and allocation is by permit. The state is now divided into regulatory areas instead of clan territories, local state fish and game biologists monitor salmon runs instead of local clan leaders. Opening and closing of fishing based on monitoring of salmons escarpment is similar to traditional management.

Name: _____

Name of Interviewee: _____

How we take care of: _____ (what resource?)

1. Do you currently, or have you ever harvested _____?
2. How do you know when it is time to harvest?
3. What tools and technology do you use to harvest?
4. How often have you harvested this resource over the years?
5. Have you noticed a change in resource abundance or distribution?
6. Why do you think changes to this resource have/or have not occurred over time?
7. Do you, your family, or your community do anything to ensure this resource will continue to be in this area?
8. How do you show respect to this resource?
9. Do you know of any traditional practices, stories, or songs that encouraged healthy stewardship of this resource?
10. On average, how much do you rely upon each year?
11. If you have extra, what do you do with it?
12. Do you think current, local management is effective?
13. What would you like to see change?

ANALYZING HISTORICAL & CONTEMPORARY FISHERIES POLICY

A Science Literacy Unit for High School



Fisheries Technology

A Science Literacy Unit for High School

Introduction

Alaska is the Russian version of the Aleutian word Alakshak, which means great lands or peninsula. The great lands of Alaska have drawn people to them for the last 10,000 years. In recent history, there were over 80,000 Tlingit, Haida, and Tsmishians living throughout Southeast Alaska. The dynamic landscape of Southeast Alaska shapes the cultures who reside there. To merely survive, thorough observation of the physical, biological, and geologic processes that affect marine and terrestrial life is required. To thrive for thousands of years, however, coastal ecology, oceanography, climatology, population dynamics, and understanding the interconnectedness of natural systems had to be mastered. Alaska's dramatic, and oftentimes harsh, landscapes remained a source of mystery until explorers began pursuing manifest destiny "rights". With the influx of settlers seeking the riches the allure of Alaska promised through mining, tourism, and seal hunting, the demand on local resources reached an exhausting level. One resource profoundly impacted and forever altered by the population increase of our state is Alaska's fisheries. Today, Pacific salmon remains a cornerstone for cultural identify, nutrition, medicine, and economy for all of Alaska's residents.

Overview

This course will investigate the challenges and opportunities created by Alaskans fisheries through an exploration of the combination of current management and traditional stewardship. Students will practice reading, writing, listening, and oratory strategies while developing an understanding for western and Tlingit science. This multi-week, seven-lesson unit focuses on the interdisciplinary study of the oral narratives, "Salmon Boy" and "Eagle Boy Harvest" to establish equity in science, math, and literacy. Students will learn fundamentals and relevant terminology in fish and wildlife issues in Southeast Alaska as they student fishing technology and gear, Pacific salmon habitats and life cycles, historical and contemporary fish and wildlife policy. The student will be challenged to assess their individual philosophies of fish and wildlife policy and programs as they engage in projects, case studies, field investigations, and research to answer the questions , "how should local knowledge influence future policies?"

Why Use Oral Narratives?

Tlingit oral narratives contain many layers which enrich our knowledge and imagination. On one level, these stories are great entertainment. Some Tlingit narratives explain how aspects of our world came to be. Other oral narratives relate epic adventures of specific clan ancestors. Stories involving Raven often include humorous exploits which may lead us to reflect upon respectful treatment of others. However, oral narratives were not told solely for entertainment.

In the past, oral narratives were used to convey many forms of knowledge. They taught about place names, property, geography, and science. From these stories, younger generations would learn about food preparation, the ebb and flow of the tides, and behavioral patterns of hunted mammals. Many of these stories assisted in the teaching of life skills such as navigation an obtaining food from the land. In addition, oral narratives were used to convey traditional values and social responsibility: They explore human nature and may involve

concepts of identity, alienation and isolation, coming of age, loyalty, pride, loss, and other conflicts humans experience throughout life. These stories are spiritual, intellectual gifts which have been passed down from esteem ancestors. Like all good literature, Tlingit oral narratives can be used to enhance content learning in the classroom. These stories can be used as a springboard to teach history, geography, science, mathematics, Tlingit heritage language, reading, writing, and more.

Note: *Tlingit oral narratives are the property of specific clans. For many stories, permission is needed before they are used in the classroom. The Eagle Boy story this unit refers to is originally a Wooshkeetaan clan story of Aak'w Kwáan (Auke tribe) from the Haa Atxaayí Haa Kusteeyíx Sitee, Our Food is Our Tlingit Way of Life as compiled by* Richard G. Newton and Madonna L. Moss and *as told by John C. Jackson of Kake. The Salmon Boy story is a composite of the versions collected by John R Swanton and George T. Emmons at the Tlingit villages of Sitka and Wrangell.*

Unit Objectives:

As a result of this unit students will understand:

- As different cultures have opposing views about resource management, regulating fisheries is a controversial topic for our state
- Local policy makers, enforcement agencies, and enhancement hatcheries: Alaska Department of Fish & Game (ADF&G), National Oceanographic Atmospheric Association (NOAA), National Marine Fisheries Service (NMFS), and Douglas Island Pink and Chum, Incorporated (DIPAC, Inc), United States Fish and Wildlife Service (USFWS)
- The differences and similarities of traditional stewardship and current management
- Local ecosystems, habitat, life cycles, and human impacts that affect Pacific salmon

As a result of this unit students will be able to:

- Analyze and evaluate information related to Alaska fisheries and express ideas both in writing and orally.
- Examine how moving from an attitude of land stewardship to resource management has impacted Tlingit culture.
- Evaluate the value of functioning in a western world (literacy and advocacy) as well as counting to uphold tradition.

Tlingit Educational Significance

- Students benefit from listening to elders and cultural specialists. An elder or cultural specialist should be invited to tell *Salmon Boy & Eagle Boy* in their own words to ensure accuracy, clan proprietorship, and complexity of the oral narratives.
- Tlingit heritage language speakers can teach Tlingit vocabulary and phrases related to stewardship, management, coastal ecology, and other factors that influence fisheries.
- This unit will validate Tlingit understanding of the ecology and geography of the local bioregion and the significance of oral narratives for promoting ethics and responsibility.
- This unit will enable Alaska Native students to understand the Tlingit ingenuity of their ancestors and will help non-Native students better understand landscape ecology and cultural history.

Culminating Project or Event

- Groups create co-management plan with accompanying outreach and education visuals (can be informational pamphlet, podcast, iMovie, or Garage Band productions if time and resources are available).
- Present visuals and plans to elders, cultural specialists, community professionals, and extended family members and offer them traditional food to thank them for their support in the classroom.

Supplemental Materials & Suggested Texts

This unit consists of project rubrics, concept maps, student worksheets, PowerPoints, and articles.

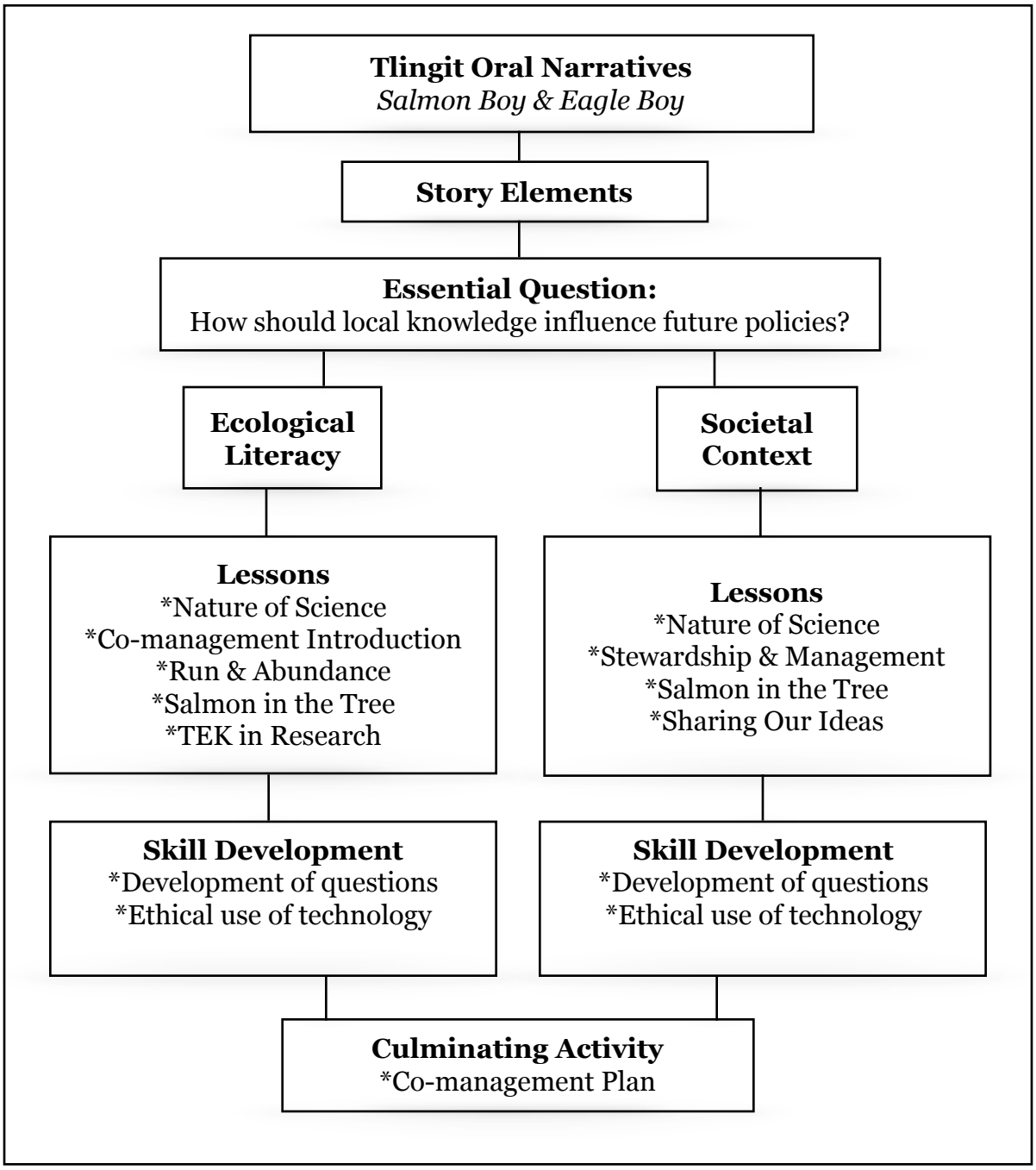
- Haa Shuká, Our Ancestors: Tlingit Oral Narratives. Nora Marks Dauenhauer and Richard Dauenhauer. 1987. Volume 1.
- Haa Atxaayí Haa Kusteeyíx Sitee, Our Food is Our Tlingit Way of Life. Excerpts from Oral Interviews. Richard G. Newton and Madonna L. Moss. USDA 3rd Edition.
- Alaska Native Science: A Curriculum Guide. Dr. Dolly Garza, the Alaska Native Knowledge Network. 2011.
- "Traditional Knowledge and Harvesting of Salmon by Huna and Hinyaa Tlingit" Final Report (102 pages of incredible information to accompany this unit)

Tlingit Story Elements

This unit will focus on two Tlingit story elements: *ecological literacy* and *societal context*. Students will build background knowledge as they meet and listen to elders and community professionals, read informational and narrative text, study local harvest gear and techniques, practice traditional processing and preservation techniques, conduct scientific experiments, and prepare a presentation as the culminating activity to address the essential question:

- How should local knowledge influence future policies?

The following chart illustrates how lessons were derived from the Tlingit oral narratives.



Embedded Literacy Strategies

The lessons in this unit utilize specific literacy strategies to scaffold student learning. Guided reading strategies ensure comprehension of informative and narrative text. Guided writing strategies allow students to communicate what they learned and to engage in the writing process effectively. The following chart defines the strategies which are incorporated into this unit.

Reading Strategies	Writing Strategies
Guided Reading: Teacher models specific strategies to guide students through challenging text. **Predicting:** Students make guesses about the text by using text features; title, pictures, and/or thinking ahead about events which could occur, based on evidence in the text. **Marking the text:** Students select text by highlighting or underlining specific components such as the main idea. **Summarizing/Paraphrasing:** Students restate in own words the essential information or main idea of a text. **Story Maps:** Students use a clearly defined graphic organizer to identify story elements. **Word Maps:** Students use a clearly defined graphic organizer to identify and reinforce word meanings.	**Guided Writing:** Teacher models the writing students are expected to do by guiding them through the writing process before students are expected to perform the same process. **Brainstorming:** Students list multiple ideas in a short amount of time without excluding any ideas. **Drafting:** Students incorporate brainstorming ideas into a written format or story. **Marking the Draft:** Students highlight or underline or code areas for revision. **Generating Questions:** Students clarify and develop ideas by asking questions of the draft. This may be a part of self-editing or peer editing. **Adding Details:** Students enhance text by adding additional words, phrases, sentences, or ideas. **Self-Editing/Peer Editing:** Students work alone or with a partner to examine and identify areas that might need correction for grammar, punctuation, and spelling.
Speaking Strategies	**Math Strategies**
Oral Reading: Students read aloud one's own text or the texts of others to share work, build fluency and increase confidence in presenting to a group. **Rehearsal:** Students engage in multiple practices of a piece of text prior to performance to refine use of story telling techniques.	**Think-Pair-Share:** Students work individually to analyze the problem and partner up to share reflections. **Graphic Representation:** Students interpret mathematical concepts to create visual organization of data. **Group Presentation:** Students work together to share graphic representations, analysis, and conclusions.

Standards Addressed in this Unit

Themes (*parallels AP Environmental Science Content as found at http://apcentral.collegeboard.com/apc/public/repository/ap-environmental-science-course-description.pdf and Juneau School District's science content standards*)

Science

1. Science as Inquiry and Process:
- Science is a method of learning and constantly changes the way we understand the world.
  SA1.1 Students ask questions, predict, observe, describe, measure, classify, make generalizations, analyze data, develop models, infer, and communicate.
  SA1.2 Students recognize and analyze multiple explanations and models, use information to revise student's own explanation or model if necessary.
  SA2.1 Evaluate credibility of cited sources when conducting the student's own scientific investigation.
  SA3.1 Conducts research and communicates results to solve a problem.

2. Energy conversions underlie all ecological processes:
- Energy cannot be created; it must come from somewhere.
  SC3.1 Relate carbon cycle to global climate change.

3. The Earth itself is one interconnected system:
- Biogeochemical and natural systems vary in ability to recover from disturbances
  SC3.2 Analyze potential impacts of changes.

4. Humans alter natural systems:
- Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.
  SD3.1 Describe causes, effects, preventions, and mitigations of human impact

5. Environmental problems have a cultural and social context:
- Understanding the role of cultural, social, and economic factors is vital for solutions
  SE1.1 Research how social, economic, and political forces strongly influence which technology will be developed.

6. Human survival depends on developing practices that will achieve sustainable systems:
- A suitable combination of conservation and development is required.
  SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science.

Language Arts

a. The student restates/summarizes and connects information.
   R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information.

b. Student analyzes content of text to differentiate fact and opinion.
   R2.9 a. Differentiate between fact and opinion. b. Express opinions about text with support.

c. Student connects and evaluates cultural influences/events.
   R3.10 Compare and contrast how texts reflect historical and cultural influences.
   R4.9 Analyze the effects of cultural and historical influences on texts.

Cultural Standards

B.4 Identify appropriate forms of technology and their use for improving community.
D.3 Interact with Elders in a loving and respectful way that demonstrates and appreciation of their role as culture-bearers and educators in the community.
E.2 Understand the ecology and geography of the bioregion they inhabit.

Final Project Rubric: *Co-management Plan (including Outreach & Education Visuals)*	**Name:** **Group Members:**	
Grading Criterion (3 points/each)	No	Yes
Preparation: Student utilized regulation guidelines and project rubric to organize & plan their work.		
Focus on Task: Used time well, focused on the project, worked well with others.		
Essential Question: Created an original, interesting way to address the essential question in their presentation.		
Audience Awareness: Design, vocabulary, audio, and graphics fit target audience		
Voice Consistency: Voice quality is clear and audible throughout the presentation		
Voice Pacing: The pace fits the information presented and draws the audience into the story.		
Narration: Each member narrates a section within the presentation. Tlingit and English names of resources are given.		
Imagery: Appropriate use of images for education and outreach visuals.		
Detail: Presentation has exactly the right amount of detail-not too short or too long.		
Purpose: Establishes purpose early and maintains that focus throughout.		
Duration: Group presentation is between 3 to 5 minutes in length.		
Requirements: Product includes all required elements.		
Total Points (36 points available):		

Overview of Lessons	Literacy Strategies	Academic Vocabulary	Assessments
Lesson 1: Nature of Science *Science is a Process* Students explore the convergence of western and traditional science through guided reading, discussion, and reflection writing. • Student Page: "Ways of Knowing" article • Student Page: "Western science & traditional knowledge" article	• Guided writing • Quick-write • Think-Pair-Share • Mark the text • Paraphrasing	• traditional ecological knowledge • western science • empiricism	• Journal Prompt • Peer Reflections
Lesson 2: Stewardship & Management *Science is a Process* Students practice problem-solving strategies as they create graphic representations of abstract concepts regarding historical and contemporary fishery policy. • Student Page: What is an oral narrative? • Student Page: Copy of *Eagle Boy Harvest* • Student Page: Stewardship & Management Table	• Graphic representation • Generating questions • Annotations • Quick-write • Paraphrasing	• oral narrative • cultural context • permits • regulations • enforcement • stewardship • management	• Article summary & annotation (peer review) • Class Venn Diagram • Table
Lesson 3: Co-management Introduction *Humans alter natural processes* Students are introduced to the unit's culminating activity expectations to use the problem-solving strategy of working backwards to find the answer. • Student Page: Aak'w Kwáan & Taak'u Kwáan Map • Student Page: Final project scoring guide	• Note-taking • Generating questions • Debriefing • Quick-write • Work backward • Graphic Representation	• co-management • conservation/ management plans • local resources	• Table • Journal Prompt
Lesson 4: Run & Abundance *Humans alter natural processes* Students make predictions, run a simulation, generate questions, and discuss the challenges of estimating stock abundance of Pacific salmon. • Student Page: Predicting Uncertainty Table	• Note-taking • Generating questions • Discussion group • Graphic Representation	• population dynamics • fecundity • run • recruitment • escapement • abundance	• Table
Lesson 5: Salmon in the Trees *The Earth is one interconnected system* Students explore the concept of keystone species and the energy transfer of the different components of ecosystems through the combination of Tlingit oral narratives and academic journals. Students will work together to identify key components of local coastal food webs through stream quality testing. • Student Page: Copy of *Salmon Boy-Moldy End* • Student Page: Storyboard • Student Page: Free Response Quiz • Student Page: Fish Policy PowerPoint • Student Page: Excerpts from TEK & Fishery Article	• Quick-write • Think-Pair-Share • Mark the Text • Oral Reading • Note-taking • Paraphrasing	• water quality • dissolved oxygen • pH • fishing gear • fermentation • food preservation	• Free Response Quiz • Article Summary
Lesson 6: TEK in Research *Human survival depends on sustainable practices* Students will demonstrate understanding of the importance of ancient knowledge in today's changing world as they prepare for the final presentation. • Student Page: Interview Template (Short Project) • Student Page: Anadromous Waters Catalog (GIS)	• Think-Pair-Share • Note-taking • Work backwards	• Geographical Information System (GIS) • Anadromous	• Interview • Final project prep
Lesson 7: Sharing Our Ideas *Science is a Process* • Student Page: Final presentation	• Graphic representation • Paraphrasing	• respect	• Final project

Lesson 1
Nature of Science

Purpose
To introduce students to primary resource analysis and interpretation regarding the nature of science; to develop the skill of gathering information from multiple resources; to assess and build background knowledge of traditional ecological knowledge; to increase listening, reading, and writing fluency.

Essential Questions
- What is the nature of science?

Duration
75 minutes (1-2 sessions)

Lesson Objectives: Connecting to the Standards

SA2.1 Evaluate credibility of cited sources when conducting the student's own scientific investigation
SA3.1 Conducts research and communicates results to solve a problem
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R3.10 Compare and contrast how texts reflect historical and cultural influences.
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information

Academic Vocabulary
- Traditional ecological knowledge
- Western science
- Methodologies
- Empiricism

Materials
- Student composition notebooks
- "Ways of knowing" article: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1479546/
- "Western Science and traditional knowledge" article

Suggested Guests
- Elder to introduce Tlingit science (David Katzeek, Paul Marks-Goldbelt Heritage Foundation)
- Paul Berg (Juneau School District) to speak to high and low context cultural differences

Literacy Strategies
- Guided writing

- Quick-write
- Think-Pair-Share
- Marking the text
- Adding details
- Annotations
- Paraphrasing

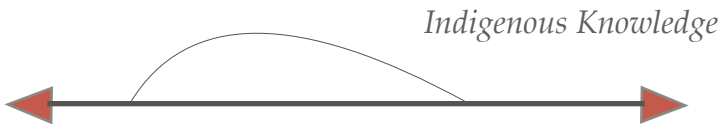
Assessments

- Pre-assessment journal response: *Essential Question*
- Check for student understanding: *Think-Pair-Share; Class list of science methodology factors*

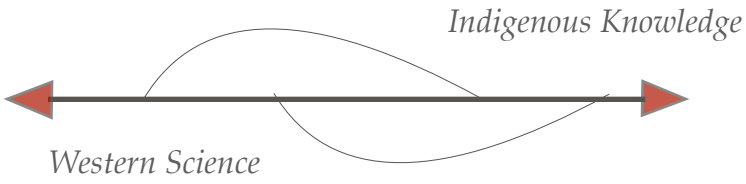
Procedure

Step 1) Introducing Content: 15 minutes

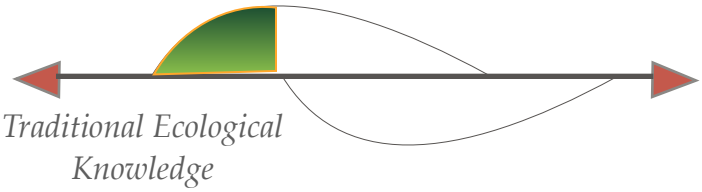
- Welcome students to a class that will challenge the way they approach science and the way they interpret the world around them. Students can expect to utilize familiar concepts such as the scientific method, but will also learn from Tlingit pedagogy in the search to find previously undiscovered commonalities and differences in the two methodologies.
- Draw a timeline on the board (this timeline was originally presented to Paul Berg of Goldbelt Heritage Foundation by a Oglala-Sioux Elder in South Dakota):



- The timeline represents time immemorial to the left (all that humans remember in our history) and the future. The curve represents knowledge held by many cultures worldwide about how the world works. It extends far into the past and includes the future.



- The second arc underneath the timeline represents what collectively is called western science, what students are familiar from learning in school. It is not as ancient as indigenous knowledge, but with tools and technology, western science is able to examine microcosms and extend theories into the future.



- Finally, the green shaded in area is what the class will be focusing on. This knowledge is held by indigenous cultures worldwide and is called Traditional Ecological

Knowledge. It is a wealth of knowledge and explanations of other macro- and micro-dimensions western science has yet to consider.

Step 2) Assessing Background Knowledge: 30 minutes

Explain:

- In order to move forward together, there needs to be a common definition of science. Hand out student binders and answer essential questions in composition notebook as a pre-assessment and present the essential questions of the lesson:
  Question 1) *What is the nature of science?*
- Teacher can use guided writing strategy to model their journal response to the question. Responses should take in consideration factors such as:
  - how do researchers conduct science, what are they looking for, how do scientists communicate their findings, and the role of ethics, culture, tools and technology *(answers will be shared during a think-pair-share session).*

Assess:

- Pair the students and have them read their answers for just Question 1.
  -Student pairs should compare and contrast their answers to create a list of unifying factors both of their reflections share
  -Student pairs should take the overlapping factors and create a working definition of science (2-3 sentences)
- Create a class list of student-driven scientific factors on the board for students to take down as notes
- Have each pair read aloud their definition of science to the class

Step 3) Building Background Knowledge: 30 minutes

- Discuss the similarities and differences in their individual responses. Read aloud (or hand out quote to staple into science notebook) the definition of science as given by the Dalai Lama of Tibet when asked to compare contemplative and scientific explanations of the world:
  "For me, science is first and foremost an empirical discipline that provides humanity with a powerful access to understanding the nature of the physical and living world. It is essentially a mode of inquiry that gives us fantastically detailed knowledge of the empirical world and the underlying laws of nature, which we infer from the empirical data. Science processes by means of a very specific method that involves measurement, quantification, and intersubjective verification through repeatable experiments. This, at least, is the nature of the scientific method as it exists within the current paradigm."
- Add any factors to the class list such as measurement, quantification, and verification through repeatable experiments if they are missing and check for student understanding
- Finish presenting the Dalai Lama's definition:
  "Within this model, many aspects of human existence, including values, creativity, and spirituality, as well as deeper metaphysical questions, lie outside the scope of scientific inquiry."

- Reemphasize the intention of the class is to find the overlap between western and traditional science methodology, the overlap will naturally be found in the humanizing elements of how and why science is conducted.
- Pass out the "Ways of Knowing" article and allow time for students to read in class. Encourage marking the text.
    - Marking the text: If your students are unfamiliar with this strategy, demonstrate how to mark the text for main ideas using the first few sentences. Underline or circle key words or phrases which help to answer the question: What is an oral narrative? Have students use the strategy for the remaining paragraphs for homework.
- Add additional factors to the what is science class list that may have been generated from the article and have students save article in notebook for the next class.

Homework: *Reading for Information & Summarizing*

- *Homework:* Pass out "Western Science and Traditional Knowledge"
- Students will read to answer the question: What is the nature of science?
- **Marking the text:** If your students are unfamiliar with this strategy, demonstrate how to mark the text for main ideas using the first few sentences. Underline or circle key words or phrases which help to answer the question: What is the nature of science? Have students use the strategy for the remaining paragraphs for homework.
- **Make annotations:** Students should write down thoughts or questions in the margins as they read.
- **Reread:** Students should be encouraged to reread the text to check for details they may have missed the first time.
- **Paraphrase:** Students will need to paraphrase their new understanding of *what is the nature science* in their journals for homework (1-2 paragraph response).

Lesson 2
Traditional Stewardship & Current Management

Purpose
To introduce students to Tlingit oral narratives and cultural ways of knowing; to create graphic representations of abstract concepts relating to historical and contemporary resource management; to build primary resource analysis and interpretation skills; to identify individual learning styles; to develop the skill of gathering information from multiple resources; to assess and build background knowledge of Tlingit and western science; to increase listening, reading, and writing fluency.

Essential Questions
- How do different cultures maintain healthy populations of their resources?

Duration
75 minutes (2-3 sessions)

Lesson Objectives: Connecting to the Standards

SA1.2 Students recognize and analyze multiple explanations and models, use information to revise student's own explanation or model if necessary
SA3.1 Conducts research and communicates results to solve a problem
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information
R2.9 a. Differentiate between fact and opinion. b. Express opinions about text with support
D.3 Interact with Elders in a loving and respectful way that demonstrates and appreciation of their role as culture-bearers and educators in the community
E.2 Understand the ecology and geography of the bioregion they inhabit

Academic Vocabulary
- oral narrative
- cultural context
- permits
- regulations
- monitoring
- enforcement

Materials
- Student composition notebooks
- "What is an oral narrative" worksheet
- Copy of *Eagle Boy Harvest*
- Stewardship & Management table

- "Traditional Knowledge and Harvesting of Salmon by Huna and Hinyaa Tlingit" Final Report (102 pages of incredible information for use with this unit)

Suggested Guests
- Elder to introduce Tlingit oral narrative (contact Goldbelt Heritage Foundation)
- Paul Berg (Juneau School District) to speak to high and low context cultural differences and the role of culture in science today
- ADF&G representative to discuss how permits and regulations are turned into legislation and the process of science that determines permit numbers each year

Literacy Strategies
- Graphic representation
- Generating questions
- Marking the Text
- Quick-write
- Rereading
- Annotations
- Paraphrasing

Assessments & Student Pages
- Pre-assessment: Peer review and share out of article summaries (homework from lesson #1)
- Assessment: *What is an oral narrative?*
- Assessment: *Venn Diagram of Tlingit and Western Science (whole class: what parts of the two methodologies overlap?)*
- Assessment: *Creating a stewardship & management table (compare and contrast historical and contemporary policies)*

Procedure

Step 1) Introducing Content: 30 minutes
- Begin with summarizing the article students read for homework, "Western science and traditional knowledge."
- Model peer review and discuss how self and peer revision will be a regular part of the class. When reading, reviewing, and editing each other's work, suggestions and reflections should be given in a respectful manner.
- Students should exchange their article summaries for peer revision and group discussion about the new topic of western science and traditional knowledge

Step 2) Assessing Background Knowledge: 20 minutes

Explain:
- As the author of "Western science and traditional knowledge," Fulvio Mazzocchi stated:

> *"despite their variations, different forms of knowledge can learn from each other…the British anthropologist Gregory Bateson has compared knowledge about the material world to a map and the terrain it describes: the map itself is not the terrain, but only one representation of it (Bateson, 1979). Just as different maps can give accounts of the same territory, so too can different*

forms of knowledge about the material world. Its actual representation ultimately depends on the observer's view."

- With great societal change and challenges, tremendous solutions wait on the horizon. Scientific reductionism has explained in great detail many components of the natural world. Western science, however, becomes a cultural myth when stated as the only way to approach truth. Traditional scientific approaches of controlled, repeatable experiments cannot be applied to phenomena that fall outside of specific conditions.

  "…Hence, the integration of methods and results from different approaches and levels of analysis can become essential. These considerations seem to be particularly relevant for studying biological, ecological and social phenomena that include different levels of complexity. As already mentioned, the Western tradition of thinking is developing a different approach to gaining knowledge from complex systems, but it would be equally useful to learn how traditional approaches explain such complexity. Not only are they more holistic, but also they seem to be better suited to coping with the uncertainty and unpredictability that are viewed as intrinsic characteristics of natural systems. Western science and traditional knowledge constitute different paths to knowledge, but they are rooted in the same reality. We can only gain from paying attention to our cultural history and richness."

Assess:

- Using their resources (notes, summaries, and the two annotated articles from lesson #1 "Ways of knowing" and "Western science and traditional knowledge") students should contribute to a class construction of a Venn diagram that displays the similarities and differences in western and Tlingit science. The overlapping circle is the heart of true science.

Step 3) Building Background Knowledge: 25 minutes

Cultural Ways of Knowing:

- Cultural ways of knowing have been categorized into high and low context cultures. There is no good or bad within these schemas, it just refers to how people in varying societies learn and conduct their daily lives.
  - Low context refers to cultures that depend heavily on directional language for communication, understanding, and reference. Families tend to be nuclear and societal systems are divided and reduced for simplification. Examples of low context culture are many Western societies and institutions. American education system is extremely low context as demonstrated by 70% of the school day being devoted to instructions "take out your book, turn the page, change classes, etc…"
  - High context cultures consist of many Indigenous cultures. Words are more of a releaser between community members, with many things being communicated through body language and context. It is not unusual for individuals to be multi-talented in dancing, singing, musical instruments, acting, producing art work and crafts. Families are community-oriented and there are usually multi-generations living in one household. French society is another example of high context culture.
- Oftentimes, placing high context individuals in low context settings does not work well. Americans can go both ways. Low context within our institutions and dominant language, but high context on special events like graduation and weddings.
- Explain that just as there are cultural ways of knowing, individual ways of knowing also differ greatly across humanity. Pass out "Brain dominance assessment" for

students to fill out for homework. Explain that they are to answer the questions based on their true tendencies and to not overthink each question to vary the answers.

- Due to a great difference in ways of knowing, there are a variety of ways of sharing knowledge. Within today's Western paradigm, science theories and facts are only accepted out of peer-reviewed scientific journals where multiple experts have checked experiments and conclusions. In Tlingit culture, information is shared through oral narratives and At.oow', sacred belongings of families and clans. Just as the Smithsonian Institute contains libraries of knowledge, elders hold ancient knowledge that was tested as true through the act of living in Alaska's dynamic landscapes. The oral narratives, Chilkat and button blankets, hats, armor, wooden sculptures, and other At.oow' act as the peer-reviewed journals that communicate and verify certain theories, facts, and conclusions about natural systems.

Tlingit Oral Narratives in this Unit:

- Introduce Tlingit oral narratives by creating a discussion around what students think an oral narrative might be.
- Explain that oral narratives have different purposes and pass out the "what is an oral narrative?" worksheet. Students should read through the description remembering to mark the text, annotate, and paraphrasing their understanding of the significance of oral narratives. As a class, two Tlingit oral narratives will accompany science lessons to better understand the ecology and natural history of Alaska to help answer the unit's essential question, "*how should local knowledge influence future policies*?"
    - If possible, have a Tlingit knowledge bearer such as David Katzeek, Paul Marks, or Fred White visit the class to lead the discussion of what is an oral narrative and to share one with the class. Depending on clan rights and who is able to present to the class, it would be ideal to have *Eagle Boy (Wooshkeetaan clan story)* be told, but students will benefit from any oral narrative shared with them.
- Deeper exploration of the two oral narratives and interactions with Tlingit elders and knowledge bearers will be presented throughout the unit. Two oral narratives will accompany this unit, both are stories of humans saved by animals who in turn become a part of the animal community whom they learn from. Both speak of stewardship practices in Southeast Alaska.

Homework: Reading for Information & Graphic Representation

- *Homework:* Students to read *Eagle Boy* and complete the "Stewardship and Management" table to identify the similarities in historical and contemporary policies.
- **Paraphrase:** In their science notebooks, students should summarize the way regulations are communicated in both cultures and how those approaches work (or don't work) across cultures.

Lesson 3
Co-management Introduction

Purpose
To introduce students to unit and final presentation; to reinforce student understanding of text through storyboard creation; to understand the challenges of estimating run and abundance; to simulate population dynamics calculations; to build primary resource analysis and interpretation skills; to develop the skill of gathering information from multiple resources; to assess and build background knowledge of Tlingit and western science; to increase listening, reading, and writing fluency.

Essential Questions
- How do different cultures maintain healthy populations of their resources?
- What are the challenges of fishery management?

Duration
150 minutes (2 75-minute sessions)

Lesson Objectives: Connecting to the Standards

SA1.1 Students ask questions, predict, observe, describe, measure, classify, make generalizations, analyze data, develop models, infer, and communicate
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information
R2.9 a. Differentiate between fact and opinion. b. Express opinions about text with support
D.4 Gather oral and written history information from the local community and provide an appropriate interpretation of its cultural meaning and significance.
E.2 Understand the ecology and geography of the bioregion they inhabit

Academic Vocabulary
- fisheries
- ecosystem dynamics
- run
- abundance
- uncertainty

Materials
- Dr. Dolly Garza's Alaska Native Science: A Curriculum Guide (available through Alaska Native Knowledge Network; highly recommended; lesson #3 inspired by and modified from "Co-Management: the Eskimo-Walrus Commission"
- Student composition notebooks

- Aak'w Kwáan and Taak'u Kwáan Map
- Final Project Student Rubric
- Use http://www.adfg.state.ak.us/ and www.fws.gov (1-800-362-5148) to locate local conservation and management plans (plans not included, can be specific resource of interest to class)

Suggested Guests
- Cultural Specialist of GHF to explain traditional stewardship and clan protection of water systems
- ADF&G representative to discuss how permits and regulations are turned into legislation and the process of science that determines permit numbers each year
- ADF&G representative to present current Pacific Salmon management plan
- NMFS agent to discuss research vessel expeditions and methodologies regarding run and abundance
- US Fish & Wildlife Service representative to discuss federal regulations regarding marine mammals of cultural significance

Literacy Strategies
- Note-taking
- Generating questions
- Debriefing
- Quick-write
- Work backward
- Paraphrasing

Assessments
- Pre-assessment: *Think-Pair-Share stewardship and management tables*
- Assessment: *What you think you need to know (journal prompt)*

Lesson Extensions
- Utilize GHF's "Bristol Bay Fishery" written by Paul Berg of Juneau School District to add math components of a commercial fisherman's annual expenses

Procedure

Step 1) Making Connections: 15 minutes
- Much of what elders and cultural specialists say is full of rich and rigorous science content. Listening for the science is like learning to speak another language, it comes naturally by broadening our vocabulary and opening our minds to listen to what is truly being said behind each story, phrase, or discussion.
- Students should think-pair-share their tables from the night before to lead into a class discussion of the overlap and differences of traditional stewardship and contemporary management. Discuss with the class how both cultures are trying to prevent disrespectful actions, but how broad rules and regulations may oftentimes be inappropriate for some communities given its geography, dependence on harvested food, or cultural celebration needs (pg 72 of Alaska Native Science).
- In the book, Haa Atxaayí Haa Kusteeyíx Sitee, Our Food is Our Tlingit Way of Life, immediately following the *Eagle Boy* story is this literary analysis:

This story is particularly rich in content, only some of which will be discussed here. It clearly demonstrates that hunting knowledge was considered a privilege and that the hunter was invested with special power over the natural world. The power was to be used judiciously, with due respect afforded to the prey. The story begins with he young boy's attempt to provide for his aging grandparents. This kind of motivation was very important in strengthening the fabric which binds the extended family together. The grandparents caution their grandson to be careful, to watch the tides, emphasizing the inherent danger in the traditional quest for survival. The young boy is rescued by an eagle, and in Tlingit legend, animals often appear as benevolent beings with powers to save humans, especially from disasters deriving from a person's lack of knowledge or inexperience. Later on, the boy recognizes the eagle as a beautiful young woman. The world is filled with animals emerging as humans, and humans being transformed into animals. This, in and of itself, demonstrates the interdependence and intimacy of humans and those beings of the natural world. The boy is an orphan, but aspires to hunt with the skill of an eagle. He is adopted by the eagle family; the father-in-law gives him the various shirts which symbolize inherited power. This parallels the human world in which privilege and power is passed on through clan of family ranks. But along with increasing power, comes greater responsibilities. In the end, the boy, now a grown man, abuses his power by killing more than he needs. The ubiquitous raven crows, as the man dies in punishment for his transgression.

Step 2) Assessing Background Knowledge: 30 minutes

Explain:

- Explain that in this unit, students will be working in small groups to find a middle ground between traditional stewardship and contemporary management referred to as co-management. Juneau sits on Tlingit territory known as Aak'w Kwáan (north and west of Juneau) and Taak'u Kwáan (south east of Juneau, area between Juneau and Taku Glacier approximately). Explain the history of the formation of Southeast Alaska's archipelago, and how islands created natural boundaries for distinct clans to protect and identify with natural resources. Aak'w Kwaan consists of L'eeneidi (Raven moiety) and the Wooshkeetaan people (Eagle moiety). Taak'u Kwaan was the Yanyeidi clan (Eagle). Hand out map so students can visualize the place the Eagle Boy story derived from. In order for Tlingits to thrive in Southeast Alaska for thousands of years, they must have developed and mastered an intimate understanding of the land and ocean.
- Explain that some countries are moving towards co-management. Present on Parks Canada of the Yukon Territory's Kluane National Park or the Eskimo Walrus Commission presented in Dr. Dolly Garza's Alaska Native Science: A Curriculum Guide. In Canada, the national parks followed a similar pattern of the United States, they removed and relocated First Nations people who had lived within the newly defined park boundaries for thousands of years and restricted their ability to hunt or gather within the new national park. The national park hired only empirically trained scientists and college graduates to staff the park, issue the permits, and educate the visitors in only French and English. Recently, Parks Canada has made formal apologies to the First Nations people and have dropped their hunting, fishing, and harvesting

regulations for First Nations people. Biologists have also began to hire First Nations hunters to contribute to research and more accurate permitting processes. Following the advice of a local elder, permits were redesigned for moose hunting to allow the moose population to bounce back from their formally precarious state. The visitor center is now located in a building owned by the local tribe, and the park has hired indigenous knowledge bearers to inform the public oftentimes in English, French, and their native language. Interpretive signs throughout the park also acknowledge the land and culture of the First Nations people. Populations of animals and berry patches now thrive and residents are more likely to agree with and understand developed co-management regulations. The First Nations tribes are moving towards a healthier and more sustainable relationship with the federal government built on mutual respect rather than mistrust and misuse of local resources.

- The culminating activity consists of group presentations of co-management plans that will take into consideration natural resource stewardship and current management, cultural inclusion and sensitivity, traditional ecological knowledge, information generated by local community members, population dynamics, natural systemic changes, global concepts and challenges, and must convey the ability to express out the new co-management policy to the surrounding communities through outreach and education. Roles can be assigned for the final project that include:
    - Resource Advocate: This student represents the voice of the resource.
        - For example: What are the ecological conditions that make this resource thrive? How would it be harvested and what is it's relationship with humans? What other animals depend on this resource? What are the challenges and opportunities existing as this resource?
    - Historian: Student gives an overview of the previous health of the resource and traditional stewardship practiced to maintain stock levels.
        - For example: For example, if using herring as a resource, this person would explain the abundance of herring as evidenced in Tlingit historical oral records/narratives, the location of the populations, and the fact that preferred herring egg substrate (rocks) used to be placed in harbors. Additionally, Tlingits used seaweed and branches to create even more (harvestable) substrate for eggs. With the introduction of foreign, commercial-size fisheries collecting herring eggs, the herring population has virtually disappeared from many areas along the coast.
    - Co-management Presenter: Presents existing contemporary management plans and the solutions presented through co-management. Clearly voices how and why co-management is necessary.
    - Communicator: Student has a plan to advocate for co-management to the audiences affected by policy changes.
    - Educator: Student works closely with the communicator to develop visuals to inform the public as to how/why co-management plans should be implemented.

- Hand out final scoring rubric and discuss expectations (student page).
- Students need to know where they are going by understanding the final project rubric. One problem-solving strategy is to work backwards. On the learner's model students first need to ask questions in order to move forward seeking answers. What do students need to understand to be able to understand to develop a co-management plan of a local resource?

Assess:

- Using their resources (the Aak'w and Taak'u map, notes, and the final scoring rubric), students need to do a quick write to answer "what do I need to know to be able to develop a co-management plan to encourage the cooperation of local hunters/ gatherers and resource managers?"
- Partner students up to compare and contrast essential factors and things to know. Have students continue to add details to their own responses.

Step 3) Building Background Knowledge: 45-75 minutes

Developing Local Management

- Invite guest speakers of federal agencies to discuss the development of local management if possible.
- Review a local management or conservation plan (might be found in both) as a class. Use literacy strategies such as reading aloud, marking the text, and annotations to make the document easy to digest. Students should be reading for information to answer the question, "what do I need to know to be able to develop a co-management plan to encourage the cooperation of local hunters/gatherers and resource managers?"

Homework: *Reading for Information*

- *Homework:* Send a copy of the conservation/management plan home with students. They should generate a graphic organizer to include the their answers to what do I need to know to be able to develop a co-management plan to encourage the cooperation of local hunters/gatherers and resource managers? They should make a graphic organizer of their factors to keep as reference for the creation of their final project.

Lesson 4
Estimating Stock Run and Abundance

Purpose
To investigate the relationship between resources and people; to explore abiotic and biotic factors that influence resource health and status; to introduce students to primary resource analysis and interpretation regarding the interconnectedness of the world demonstrated by the carbon cycle; to develop the skill of gathering information from multiple resources; to assess and build background knowledge of traditional ecological knowledge; to increase listening, reading, and writing fluency.

Essential Questions
- What ecological conditions affect population dynamics and distribution?
- What are the challenges of fishery management?

Duration
75 minutes (1 sessions)

Lesson Objectives: Connecting to the Standards

SC3.1 Relate carbon cycle to global climate change
SA1.2 Students recognize and analyze multiple explanations and models, use information to revise student's own explanation or model if necessary
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R4.9 Analyze the effects of cultural and historical influences on texts.
A.2 Students will recount their own genealogy and family history
E.2 Understand the ecology and geography of the bioregion they inhabit

Academic Vocabulary
- population dynamics
- fecundity
- run & abundance
- recruitment
- escapement
- stock status
- limiting factors
- habitat

Materials
- Presentation on salmon life cycles and habitat (not included).
- Dr. Dolly Garza's Alaska Native Science: A Curriculum Guide (available through Alaska Native Knowledge Network); highly recommended; lesson #4 inspired by and modified from "Herring Management: Traditional & Contemporary"
- Student composition notebooks
- 8 lunch size paper bags with top half cut off

- 100's of green (or any color) beans
- 100's of brown (or any different color) beans
- blindfolds

Suggested Guests
- Cultural Specialist of GHF to explain traditional stewardship and clan protection of water systems
- ADF&G representative to discuss how permits and regulations are turned into legislation and the process of science that determines permit numbers each year
- ADF&G representative to present current Pacific Salmon management plan
- NMFS agent to discuss research vessel expeditions and methodologies regarding run and abundance
- US Fish & Wildlife Service representative to discuss federal regulations regarding marine mammals of cultural significance

Literacy Strategies
- Quick-write
- Think-Pair-Share
- Mark the Text
- Oral Reading
- Note-taking
- Debriefing

Assessments
- Pre-assessment: *Collect Basket Bay History worksheet (homework)*
- Assessment: Short-term project

Lesson Extensions (Field Study Experience)
- Take a field trip to NMFS at the NOAA building in Juneau to explore tools and technology used on research vessel to estimate stock abundance

Procedure

Step 1) Introducing Content: 15 minutes
- Students should peer review their list of factors. As a class, generate a list that includes these factors (page 73 of Alaska Native Science):
  - the status of the stock
  - the historic biomass/size of stock
  - the "whys" of rules and regulations
  - how the rules and regulations are monitored and enforced
  - how the health of the stock is monitored in-season
  - how new biological information is gathered and updated
  - how can local knowledge be included in the future policies?
- Remind students of abiotic and biotic factors. Create class posters of the abiotic and biotic ecological conditions that affect Pacific Salmon. Posters should include other plants, animals, bacteria, viruses, spawning rock size, nutrients from eroding sediments, water temperature, stream quality, river channels and depth, currents, open ocean basins, etc.

Step 2) Assessing Background Knowledge: 15 minutes

- Move into a conversation about the population dynamics and how an organism's success or group size depends on abiotic and biotic factors. Tlingit harvesters designated community members to officially caretake or observe fish population dynamics year to year. Create a group discussion in small groups regarding: Do you think fish populations stay the same year to year? What influences the group size? How would you measure population size? Students write a math equation that represents population size, births, and deaths. (Correct answer: Population = Fecundity - Mortality).
- Choose a Pacific salmon species relevant to your region (should match the conservation/management plan from previous lesson). The status of Chinook is precarious presently for many factors, some known and some unknown, and might be appropriate for many regions across Southeast. They have been threatened by over harvest, and populations damaged by dams, climate change, and habitat degradation.

Step 3) Building Background Knowledge: 60 minutes

****Full detailed lesson in Alaska Native Science: A Curriculum Guide** (page 27)*

- Give presentation on salmon life cycles and habitat (not included).
- Clan ownership of water systems can be compared to CDQs (Community Development Quotas) or IFQs (Individual Fishing Quotas). "Rituals and legends often dictated clan members' actions." For example, "salmon rituals include showing respect to the first salmon coming up the river…It is told the salmon spirits would tell their fellow salmon that they were treated well and that the other salmon should come up river and give themselves to the people." Today, contemporary management refers to this tool as escapement. The salmon returning to an area is called recruitment.
- Tlingits studied the return of anadromous fish very carefully as they knew the fish populations year after year and understood the local landscape ecology.
- Fisheries managers today have a more difficult time estimating total stuck abundance throughout Southeast Alaska. Next, the class will create a model/run a simulation of predicting with uncertainty (pg. 47 of Alaska Native Science).
- In small groups, pass out paper bags with a known, but secret amount of beans. Students shouldn't know how many of each color are in the bags, and each group can be a little different (Group A: 20 green and 80 brown, Group B: 25 green, 75 brown, etc)
- Each group should write down a hypothesis of how many green beans out of every 10 they will draw. Test the hypothesis by blindfolding one member of the group and having them draw 10 balls and the group should record the results (student page: Uncertainty Results table) to test if the hypothesis held true. Repeat experiment 4 more times and find the average amount of green balls.
- Students can rewrite their hypothesis and repeat the experiment 5 times to compare the two averages.

Homework: Generating conclusions

- Students should respond to the following statements in their science journal:
- Without the teacher knowing the correct amount, is it possible to ever know if their estimate is correct? Discuss how this relates to the challenges fishery biologists face in every ocean/river/or pond.

Lesson 5
Salmon Boy

Purpose
To investigate the relationship between the environment and people; to use literary analysis when reading Tlingit oral narratives and academic journals; to introduce students to primary resource analysis and interpretation regarding the interconnectedness of the world demonstrated by food webs; to develop the skill of gathering information from multiple resources; to assess and build background knowledge of traditional ecological knowledge; to increase listening, reading, and writing fluency.

Essential Questions
- How is an ecosystem weaved together like a Chilkat blanket?
- How are producers and consumers connected?
- How is science communicated?

Duration
60-120 minutes (2-75 minute sessions)

Lesson Objectives: Connecting to the Standards

SE1.1 Research how social, economic, and political forces strongly influence which technology will be developed
SA1.2 Students recognize and analyze multiple explanations and models, use information to revise student's own explanation or model if necessary
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information
B.4 Identify appropriate forms of technology and their use for improving community
E.2 Understand the ecology and geography of the bioregion they inhabit

Academic Vocabulary
- water quality
- dissolved oxygen
- pH
- fishing gear
- fermentation

Materials
- Copy of *Salmon Boy-Moldy Ends*
- Storyboard
- Free Response Prompt
- Presentation on salmon species lifecycle and habitat (not included)

- Tlingit Gear & Technology PowerPoint (included)
- Excerpts from "Traditional Ecological Knowledge of Tlingit People Concerning the Sockeye Salmon Fishery of the Dry Bay Area" (full version at https://www.academia.edu/948885/Traditional_Ecological_Knowledge_of_Tlingit_People_Concerning_the_Sockeye_Salmon_Fishery_of_the_Dry_Bay_Area)

Suggested Guests & Field Experience

- Dr. Rick Edwards of US Forest Service PNW Lab; Lead Stream Ecology Scientist
- Visit the new US Forest Service Héen Latinee Experimental Forest with Dr. Rick Edwards and a GHF cultural specialist to test for stream quality, rock size, and forest types that affect Pacific salmon species of study in addition to the affects of the carbon cycle and climate change
- Cultural Specialists of GHF to speak to fishing gear, Tlingit & Haida canoes, and food preservation
- Henry Hopkins of JSD and Helen Watkins (contract through GHF) to speak to canoe design, fishing gear, and food preservation

Literacy Strategies

- Quick-write
- Mark the Text
- Oral Reading
- Note-taking
- Debriefing

Assessments

- Assessment: Free Response Prompt
- Assessment: Article summary

Procedure

Step 1) Introducing Content: 30 minutes

- Begin class with a group discussion reflecting on the main themes presented in the model. Explain that there are many factors influencing salmon recruitment and escapement. To examine the overlap between Tlingit salmon rituals and resource management, hand out copies of *Salmon Boy-Moldy Ends*.
- Students should mark-the-text and annotate as they read. Students should think-pair-share the main concepts of the story. Afterwards, they should use the storyboard template to draw and sketch the main components of the oral narrative. In their science journals, students should summarize the parallels of historical and contemporary management conveyed in the story.

Step 2) Assessing Background Knowledge: 45-60 minutes

Explain:

- Explain that ecology is a concept that has always been understood by cultures over time. Navigation, fishing technology, trade, and food preparation all require a deep exploration of ecosystems and the activities that potentially cause changes to surroundings.

Assess:

- Present students the Free Response Prompt that is a modified version of questions used on the AP Environmental Science exam each year. Students should complete the free response *(to be collected)*.

Step 3) Building Background Knowledge: 30 minutes

- Introduce the standard "SE1.1 Research how social, economic, and political forces strongly influence which technology will be developed"
- Visit the Héen Latinee Experimental Forest, the Mendenhall River, Montana River, or the confluence of both to conduct water quality sampling, rock size pebble counts, and forest type surveys.
- Technology, in turn, can have potential for great impacts intellectually, socially, for health and wellness, and on the environment. Explain that students will be examining some of the forms of technology designed by Tlingit ingenuity that affects the fishing technology seen in the world today.
- Show "Tlingit Fishing Gear & Food Preservation" PowerPoint and have students take notes. Have guest speakers present on the topics of Tlingit and Haida canoes, fish gear, fermentation, food preparation, and navigation if possible.

Homework:

- Pass out excerpts from "Traditional Ecological Knowledge of Tlingit People Concerning the Sockeye Salmon Fishery of the Dry Bay Area" (full version at https://www.academia.edu/948885/Traditional_Ecological_Knowledge_of_Tlingit_People_Concerning_the_Sockeye_Salmon_Fishery_of_the_Dry_Bay_Area)
- Students should read, mark the text, annotate, reread if necessary, and paraphrase in their science journals to answer the question, "what is the relationship between traditional ecological knowledge, current research, and future fisheries policies?"

Lesson 6
Traditional Ecological Knowledge in Research

Purpose
To develop the skill of gathering information from multiple resources; to assess and build background knowledge of traditional ecological knowledge; to combine previous knowledge into preparation for culminating activity; to introduce students to primary resource analysis and interpretation; t to increase listening, reading, and writing fluency.

Essential Questions
- How do we monitor the health of an ecosystem?
- What insights can elders share about our local resources?

Duration
150-225 minutes (2-3 75 minute sessions)

Lesson Objectives: Connecting to the Standards

SA1.1 Students ask questions, predict, observe, describe, measure, classify, make generalizations, analyze data, develop models, infer, and communicate
SA3.1 Conducts research and communicates results to solve a problem
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R4.2 Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information
B.4 Identify appropriate forms of technology and their use for improving community
D.3 Interact with Elders in a loving and respectful way that demonstrates and appreciation of their role as culture-bearers and educators in the community
E.2 Understand the ecology and geography of the bioregion they inhabit

Academic Vocabulary
- Geographical Information System (GIS)

Materials
- Computer lab for GIS work (Explore ADF&G's Anadromous Waters Catalog: http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc)
- Computer lab for exploring outreach and education materials from fishing regulation agencies
- Computer lab for conducting group research on species-specific co-management plan
- Interview templates

Suggested Guests
- Cultural Specialist of GHF to discuss traditional and customary harvest
- Subsistence fishermen, hunter, and/or harvester

Literacy Strategies

- Conduct an interview
- Note-taking
- Work backwards
- Quick-write
- Graphic Representation

Assessments

- Pre-assessment: Article summary
- Assessment: Completed interview
- Assessment: Anadromous waters catalog
- Assessment: Final Project Preparation

Procedure

Step 1) Introducing Content: 30 minutes

- Students should think-pair-share about the article excerpts from the day before.

Step 2) Assessing Background Knowledge: 45-60 minutes

Explain:

- Explain that Tlingit, Haida, and Tsmishian lived throughout Southeast Alaska due to their comprehensive understanding of coastal ecology, geology, and oceanography.
- As a short term project, students will need to conduct an interview with a local community member (Native or non-Native) about their hunting, fishing, or harvesting practices.
- Introduce the concept of Geographical Information Systems (GIS). GIS is defined to:

  > "integrate hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically reference information. GIS allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. A GIS helps you answer questions and solve problems by looking at your data in a way that is quickly understood and easily shared."

Assess:

- Students should work individually to explore the GIS map of the Anadromous Waters of Southeast Alaska at http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc. Layers to turn on and off include:
  - Fish type
  - Fish passage
  - Life cycles of fish by species type (spawning and rearing)
  - 2009 aerials
  - Topographic lines
- Allow students to explore the coastlines of Aak'w Kwaan and Taak'u Kwaan for their species type.

Step 3) Building Background Knowledge: 30 minutes

- Use the book Haa Léelk'w Hás Aaní Saax'ú: Our Grandparents' Names on the Land. Edited by Thomas F. Thornton. 2012. to have students research certain sites of interest

of their species found in the catalog to look for evidence in Tlingit place names and history.

- Students should prepare their final presentation slides for a class slideshow on their proposed co-management plan. They should explore current education and outreach materials to aid in the design of their co-management visuals. Students should ask themselves what works well in agency outreach and education, and what areas could improve, especially when reaching across cultures.
- If students are focusing on a different species than the one studied throughout this unit, students should conduct their own research as to the current conservation and management plans and the challenges faced with current management.
- Teacher can prepare for final presentation event:
    - Have students sign thank you cards for guest speakers
    - Make sure all groups complete their visual slides and narration
    - Secure a venue for culminating activity
    - Invite elders, cultural specialists, and extended family members to come to the event
    - Assign students to prepare and bring traditional food and drinks for the events
    - Run a dress rehearsal with the students so they have a chance to practice presenting their work to a larger audience

Short-Term Project: *Generating Questions*

- *Homework:* Students should use the interview template to conduct a local interview with a family member or community member to gather information about hunting, fishing, or harvesting practices, especially related to their co-management plan. Explain that harvesting techniques and abundance is a very sensitive issue. Elders may also not be comfortable with the word resource since it implies living things are commodities. Students should approach this assignment with sensitivity and care.

Lesson 7
Sharing our Ideas

Purpose
To combine previous knowledge into preparation for culminating activity; to assess student understanding and ability to communicate knowledge; to assess and build background knowledge of traditional ecological knowledge; to increase listening, reading, and writing fluency.

Essential Questions
- How should local knowledge influence future policies?

Duration
60-90 minutes

Lesson Objectives: Connecting to the Standards

SA1.1 Students ask questions, predict, observe, describe, measure, classify, make generalizations, analyze data, develop models, infer, and communicate
SA3.1 Conducts research and communicates results to solve a problem
SF1.1-SF3.1 Investigate the influences of societal and or cultural beliefs on science
R2.9 a. Differentiate between fact and opinion. b. Express opinions about text with support
B.4 Identify appropriate forms of technology and their use for improving community
A.2 Students will recount their own genealogy and family history
D.3 Interact with Elders in a loving and respectful way that demonstrates and appreciation of their role as culture-bearers and educators in the community
E.2 Understand the ecology and geography of the bioregion they inhabit

Materials
- Completed Final Presentation Visuals
- Traditional food and drinks for guests to share
- Electronic equipment to present students' work
- Microphone and sound system
- Elders, cultural specialists, and extended family members

Literacy Strategies
- Generating Questions
- Rehearsal
- Oral Reading
- Group Presentations

Assessments

- Final Project Presentations (willingness to share and demonstrate respectful listening skills)

Procedure

Step 1) Preparation for Event

- Gather presentation materials
- Arrange traditional snacks and drinks for guests
- Assign students to usher guess in and help seat and serve elders

Step 2) Culminating Event

- Two students (preferably an Eagle and a Raven) introduce themselves to the group, thank the elders, cultural specialists, and panel members for helping them during the unit, thank people for coming, and invite people to have something to eat while they share their work. Show respect for Aak'w Kwaan and Taak'u Kwaan before the presentations begin.
- Students share the final presentation and show reverence to *Eagle Boy and Salmon Boy-Moldy End* oral narratives and their respective clans.
- Students present thank you cards to guest speakers. Guests can respond to the student presentations.
- Teacher thanks the students for all their hard work and thanks the audience for their support. Teacher encourages students to help clean up and usher elders to their transportation.